"Building World," 32 pages, including Building Trades Exhibition Illustrated Supplement.]

BUILDING WORLD

AN ILLUSTRATED

WEEKLY TRADE JOURNAL

For Builders, Carpenters, Joiners, Bricklayers, Masons, Plasterers, Sanitary Engineers, Plumbers, Painters, Slaters, Glaziers, Brickmakers, Gasfitters, Locksmiths, Decorators, Hot-water Fitters, Paperhangers,

and for all engaged in Allied Trades.

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VOL. III.—No. 76.] SATURDAY, MARCH 27, 1897. [PRICE ONE PENNY.

BUILDING CONSTRUCTION—EXAMINATION QUESTIONS AND SOLUTIONS.—XXXV.

BY PROFESSOR HENRY ADAMS, M.I.C.E.

(*Continued from No. 73, p. 347.*)

218. *Define the following terms: Dragging tie, ridge scarfing, groove, tongue, and knucklejoint mite-bordering, ramp, wreath, and twist, secret dovetailing, scarfing of timber.*—(*Royal Institute of British Architects.*)

A *dragging tie*, or dragon tie or beam, is a framework at the lower end of a hip rafter connecting it with the wall-plates in such a way as to resist the thrust of the hip rafter. The foot of the hip rafter is halved, notched, stepped, or tenoned into the dragging tie, which is notched at one end on to the wall-plates, at the angle where they are halved together, and at the other end is attached to the angle tie or brace, by means of a tusk tenon secured by a pin or wedge, the angle tie being notched over the wall-plates to keep it in place (see Figs. 312 and 313). *Ridge scarfing* is the joint in a ridge board to make up the requisite length out of two or more pieces (see Fig. 314). A *groove* is a narrow channel cut in any material, as throating in a window-sill, recesses for panels in the parts of a framed door, etc. A *tongue* is the opposite of a groove, and is made to fit in the groove to form a close joint and prevent movement. Fig. 316 shows a grooved and tongued joint between two pieces of wood. When the tongue is on one side only, and the groove on the other, it is called a matched joint, as in Fig. 315. *Knuckle-joint mite-bordering* is assumed to be a misprint for two things—knuckle-joint and mitred bordering. A *knuckle-joint* is a hinged joint that will only open to 180°, as some butt hinges. *Mitred bordering* to a hearth is an oak slip 2 in. by ½ in., mitred at the angles and sunk flush in a rebate in the floor boards round three sides of a hearthstone. Sometimes it only runs across the end grain of the boards, the object being to prevent the water used in washing the hearth from entering the end grain and causing decay. A *ramp* is a vertical bend in a handrail, concave on top, as where it leaves the straight for a rise. A *knee* is a vertical bend, convex on top, as where it leaves a rising direction for the horizontal. The conjunction of a ramp and knee is known as a *swan neck*. A *wreath* is a horizontal bend in a handrail, as where it turns round the corner of a hanging passage, and a *twist* or wrythe is a spiral curve in a handrail where made to suit winders on a circular-ended well-hole; but the term wreath is commonly used for the latter case. *Secret dovetailing* is used in cabinet-making and high-class joinery for joining the sides of drawers, boxes, etc., at the angles. The dovetails are formed on the faces of mitres or with a lap, so that when put together only a straight joint is seen (see Fig. 317). *Scarfing of timber* is the mode of joining pieces at their ends to lengthen them. They are mostly splayed joints, with bird's-mouth ends and folding wedges to draw them close, further secured by four or more bolts as Fig. 318.

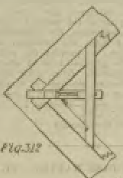


Fig. 312

Fig. 314

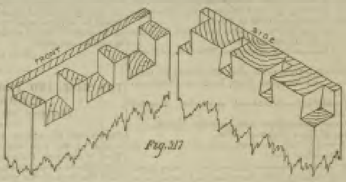


Fig. 317

Fig. 315

Fig. 313

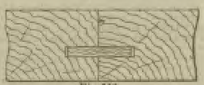


Fig. 316

Fig. 318

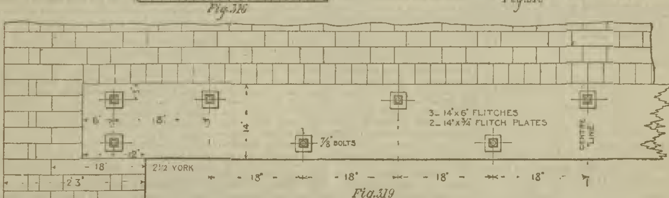


Fig. 319

Building Construction. Fig. 312.—Plan of Dragon Tie. Fig. 313.—Section through Dragon Tie. Fig. 314.—Scarfed Joint in Ridge Board. Fig. 315.—Matched Joint. Fig. 316.—Grooved and Tongued Joint. Fig. 317.—Secret Dovetailing. Fig. 318.—Scarfed Joint in Beam. Fig. 319.—Elevation of Flitched Beam Carrying 18-in. Wall.

219. *For what purpose are the following woods chiefly used by builders?—Pitch pine, American yellow deal,*

Baltic white deal? State how you would recognise them and judge of their quality.—(*Public Works Office, Ireland.*)

Pitch pine (*Pinus australis* or *Pinus resinosa*) is used chiefly for treads of stairs and flooring, on account of its hardness and wear-resisting qualities; for doors, staircases, strings, handrails, and balusters on account of its strongly marked and handsome grain; for open timber roofs on account of its strength and appearance; and for outdoor carpentry, such as jetties, on account of its length and size.

American yellow deal (*Pinus strobus*), more often called American yellow pine or Weymouth pine, is used chiefly for panels on account of its great width; for mouldings on account of its uniform grain and freedom from knots; and for patterns for casting from on account of its softness and easy working.

Baltic white deal or spruce fir (*Abies excelsa*) is used in the common qualities for the roughest work—scaffold poles, scaffold boards, centering, packing-cases, etc.—and in the better qualities for dressers and table-tops, bedroom floor boards, cupboard shelves, etc.

Pitch pine is recognised by its weight and strong reddish-yellow grain, with distinct and regular annual rings. It must be well seasoned, and free from sap and shakes.

American yellow deal is very uniform in texture, of a very pale honey-yellow or straw colour, turning brown with age, usually free from knots, and specially recognised by short dark hair-like markings in the grain when planed, and its light weight. It is subject to cup shakes and to incipient decay, going brown and "mothery."

Baltic white deal is recognised chiefly by its small hard and dark knots, by its woolliness on leaving the saw, and by its weathering to a greyish tint. When fresh cut, the grain may be more or less pronounced than that of yellow deal. Is subject to streaks of resin in long cavities, and to loose dead knots.

220. *What timber would you select for the following purposes?—Treads of stairs, floor boards, pile foundations, dock gates, planking of earth waggons, roof trusses?*—(*Admiralty Outports and Office of Works.*)

In the following list the timbers are stated in order of superiority for the purposes named.

Treads of Stairs.—Oak, pitch pine, Memel fir, ordinary yellow deal.

Floor Boards.—Oak, pitch pine, Stockholm or Gefle yellow deal; and for upper floors, Dram or Christiania white deal.

Pile Foundations.—Greenheart, oak, elm, creosoted Memel, alder.

Dock Gates.—Greenheart, oak, creosoted Memel.

Planking of Earth Waggons.—Elm.

Roof Trusses.—Oak, chestnut, pitch pine, Baltic fir (Dantzic, Memel, or Riga).

221. *A wooden bressummer is required to carry a wall 18 in. thick, weighing, with floors and roof resting on it, 15 tons, over an opening 14 ft. wide. Show how you would construct the bressummer, and how you would satisfy yourself that your construction is sufficiently strong.*—(*City and Guilds of London Institute.*)

Formula for simple beam: B.W. cwts. centre $= \frac{c\,b\,d^2}{L}$, whence safe load in tons on fir $= \frac{2 \times 3{\cdot}5 \times b\,d^2}{10 \times 20 \times L}$, or $15 = \frac{2 \times 3{\cdot}5 \times bd^2}{10 \times 20 \times L}$ $\therefore bd^2 = \frac{15 \times 10 \times 20 \times 14}{2 \times 3{\cdot}5}$ $= 6000$, and $\sqrt[3]{6000} = 18$ in. for side of square beam. This could be obtained in pitch pine only, and it would be very unsuitable for building an 18-in. brick wall upon; we must therefore try a flitched beam. Say a flitched beam of three 12-in. by 6-in. half timbers and two 12-in. by $\frac{3}{4}$-in flitched plates.

Formula for flitched beams—

$$\text{B.W. cwts. centre} = \frac{d^2}{L}(cb + 30t)$$
$$= \frac{12^2}{14}(3{\cdot}5 \times 3 \times 6 + 2 \times 30 \times \tfrac{3}{4})$$
$$= \frac{144}{14}(63 + 45)$$
$$= \frac{144 \times 108}{14} = 1111 \text{ cwt.}$$

$$\frac{1111 \times 2 \text{ for load distrib.}}{20 \text{ cwt. in 1 ton} \times 10 \text{ fact. safety}} = 11{\cdot}11 \text{ tons, which}$$

is not nearly enough. Try three flitches of 14 in. by 6 in., and two flitch plates 14 in. by $\frac{3}{4}$ in. Then

$$\frac{14}{14}(3{\cdot}5 \times 3 \times 6 + 2 \times 30 \times \tfrac{3}{4})$$
$$= 14\,(63 + 45) = 1512,$$

and $\frac{1512 \times 2}{20 \times 10} = 15{\cdot}12$ tons, which will be satisfactory, and the design will be as shown in Fig. 319.

222. *Give the formula for calculating an iron girder, and the constants for cast iron, wrought iron riveted, and rolled iron. What proportion does a safe load bear to breaking weight?*—(*University College, London.*)

Let w = breaking weight centre tons.
a = area bottom flange square inches.
d = depth of girder in inches.
c = constant.
L = span in feet.

Formula.—$w = \frac{adc}{L}$, $c = 2$ cast iron, 6 wrought iron riveted, 7 wrought iron rolled solid. Safe load usually $\frac{1}{4}$ breaking weight.

223. *Describe briefly how the character of the subsoil is ascertained for foundations, and what tools are used for the purpose.*—(*City of London College.*)

For shallow foundations, trial pits 3 ft. square may be sunk with pick and shovel at various points where the excavation can afterwards be utilised for putting concrete in to support the walls, say at the principal angles, and the ground can be pricked with a bar below to see that it is firm underneath.

For deep foundations pits would be too expensive, and trial borings are made 3 in. to 6 in. diameter—usually $3\frac{1}{2}$ in. The principal tool used is the augur, a hollow cylindrical body with a cutting lip at its lower edge to guide the material into the upper part and hold it there. As the augur brings up all it can get, the operation is called "misering," and the augur is sometimes called a "miser." Jumpers or plain wide chisels of various patterns are used for breaking up any hard material so that it can be raised by the augur, and water is poured down the hole to facilitate the breaking up, particularly if clayey. The engineer must judge of the strata penetrated partly by the difficulty of passing through and partly by the samples brought up, allowing for the water which has been poured down. For this reason as little water as possible should be used, so that the natural condition of the subsoil may be more apparent. In loose soil the bore holes sometimes have to be lined with wrought-iron tubes, flush outside, to prevent the sides from falling in and the bore from choking. The tools are joined by square rods screwed on in lengths, the top length being with an eye to take a lever bar in the case of the augur, and with lugs to take ropes which pass over pulleys in the case of the jumpers, so that they may be lifted and dropped to perform the requisite disintegration. Measurements and records must be made as the work proceeds, so that a scale section may be made of the various strata. In the case of docks and other deep structures, the borings should be supplemented by some geological knowledge of the district, and, if possible, a geological section map should be consulted.

(*To be continued.*)

THE RISE AND PROGRESS OF SANITARY PLUMBING.—VI.

(*Continued from No. 73, p. 349.*)

Continuing his address at the opening of the ninth session of the plumbing classes in the Glasgow and West of Scotland Technical College, Dr. Glaister said that hitherto it had been too much the fashion to depreciate the work of the plumber; but critics are too apt to forget that educational progress is slow, and that the plumber was suddenly brought to face problems in which a knowledge of physical and medical facts, and not merely of lead-working, had to assist in solving. It is, indeed, rare in the history of any scheme that its perfect solution is promptly arrived at; it is more usually the result of educational evolution. The science of sanitation is by no means of great age; on the other hand, it is not a creation of yesterday. Can we wonder, therefore, that in the earlier days the problem of house-sewage removal was supposed to be met by merely fixing up the necessary pipes for the sewage exit from the house, and a channel outside the dwelling whereby it might pass into a cesspool or a sewer? When traps were first deemed necessary, the forms they assumed were such as now only meet with opprobrium by present-day sanitarians, but then they were deemed excellent; the rectangular brick drain and the "dipstone" trap were thought to be satisfactory; but advancing knowledge showed that this form of drain, by its frictional surface, only offered a larger surface for sediment and of impediment to motion. Even the "pan-closet," which was deemed in its early days to have combined many points of value, now only meets with universal condemnation, expressed in varying degrees of strong language, of which that of a recent American writer may be quoted—namely: "It probably was not, but it might have been, the devil who invented it." The modern forms of traps still lay buried in the brains of their inventors. The "Somerset" trap was provisionally patented in 1868 by John Honeyman, R.S.A., of Glasgow, and was among the first of the present earthenware forms of trap; and, after all, it was but the "dipstone" principle applied to circular pipes—an acknowledged advance, at the same time, beyond what was then in existence. And it is only twenty-one years since William P. Buchan—a man whose recent death is deplored by all interested in sanitation and the advancement of the plumbing craft—patented the "cascade" trap known by his name. Since that time the numbers and names of traps have become bewildering.

The medical profession, too, for many a day attributed much of the illness which arises from drain-polluted atmospheres to sewer air and sewer gas. Probably too much has been made of this, although, at the same time, impaired health may be an expected consequence therefrom. The malignant action of microbes was not then understood, because then little was known concerning microbes; hence to sewer air and sewer gas the genesis of enteric fever and diphtheria was ascribed, which to-day would be more rightly ascribed to specific micro-organisms, of which sewer air may, however, be the vehicle. All these facts simply indicate that an educational process in sanitation all along the line has been and still is going on.

So, too, with sanitary fittings. As in everything else, so in sanitation, we chance upon isolated instances of individuals who teach doctrines, or practise them without teaching, which are hundreds of years in advance of their general adoption. The water-closet of Sir John Harrington, who lived about 1596, shows that the principles of the fitting had already been grasped. This is, after all, only an extremely rare case, yet it will astonish some to learn that the first closet to be patented dates from 1775, the patentee being Alexander Cummings; and the Bramah closet was invented by the famous mechanician of that name, who was the inventor also of the Bramah press, the bar pump, and the safety lock. Both of these fittings were valve closets, respecting the merits of which even present-day opinion is divided.

When the relation between drain-polluted air and disease became better understood, the old pan closet, which was and is still too general in use, lost its premier position, and it had to yield before less complicated, more cleanly, and therefore more efficient, forms of fittings, regarding the invention of which much ingenuity in recent years has been expended. To-day the market is flooded with closets in a multitude of forms by a multitude of makers, of which the main types are the wash-out, the wash-down, and the siphon. The ventilation of soil-pipe and traps, too, is but a recent innovation. Unless it happened that an economic craftsman perchance united the rain-conductor and the soil-pipe in one stack, or where the rain-conductor emptied itself untrapped into a house drain, ventilation of these parts of the sanitary system was unknown. As a consequence, the phenomenon of siphoning was forced upon the attention of both plumber and sanitarian; to prevent the evil consequences of which, the physical laws of atmospheric pressure had to be regarded. Even to-day there may be found existing abortive attempts to ventilate the soil-pipe by continuing it upward with a smaller pipe above the eaves. The roof-to-basement full-bore soil-pipe is not of yesterday's birth.

(*To be continued.*)

AIR-TIGHT CASE MAKING.—XI.

BY FRED W. LOASBY.

(*Continued from No. 73, p. 346.*)

The mahogany for the outer face and skirting should be glued on to the deal frame before the pine top is fixed. In preparing it, take care to have the figure of the grain running the right way. Gauge the skirting to about $\frac{3}{8}$ in. thick and 8 in. wide. Mark the shape of the moulding on the ends, work the hollow, the round, and the quirk, and clean it up with fine glasspaper to a good surface. Gauge down the back side to the depth of the plough groove on the deal frame, and plough to suit it; and when all four pieces are prepared, traverse the deal frame, also the mahogany skirting, with a toothing plane so that a good sound joint is obtained. A toothing plane has a cutting iron the edge of which is similar to the teeth of a dovetail-saw, and is chiefly used by cabinet makers for veneering. It makes innumerable small furrows on both faces of the material about to be glued together, and so affords a good key for the glue.

Take the length of the sides of the deal frame and mark it on the back side of the mahogany skirting, which will be the shortest point of the mitre. Cut these mitres, and glue blocks on at each angle, say three on each, perfectly square from the mitre, for fixing the hand screws on to pull it up when glued. On the face side plough across the mitre to receive an eighth tongue, stopping the groove below the moulding. When this is done, try all together on the deal frame, holding the mitre together by means of hand screws, when, if all the mitres come up nicely, the skirting may be glued on. First glue on one side, holding it securely by placing hand screws down from the top edge and clasping the deal and mahogany together, then work round in the same way until all four pieces are fixed.

The cornice and fascia, of which the upper portion of Fig. 81 is a section, should be made either of good dry mahogany, or of pine with a mahogany face. First take two pieces of mahogany 6 ft. long, and two pieces 4 ft. long, both 6 in. wide and $1\frac{1}{2}$ in. thick. Face up and gauge them to 6 in. wide and $1\frac{3}{8}$ in. thick, and form a rebate on the top edge of the inner face $\frac{1}{2}$ in. by $\frac{1}{2}$ in. deep, to receive the top or cover board. Plough the bottom edge on the inner face to receive the air-tight fillet, rebate out $\frac{3}{16}$ in. deep on the bottom edge of face side to receive the neck moulding, then plough the upper edge of the face to receive the tongue of the cornice moulding. Should this fascia be prepared out of pine and veneered, the veneer should be the same thickness as the depth of the rebate for the neck moulding. It would then form a rebate in itself, also the cornice would require to be that much thicker on the back side to fit into the rebate. When this is done, cut rods to the extreme length and width of the case: this will be to the short point of the mitre. Cut off each piece to the lengths of the rods and mitre them, then plough across the mitres to receive the tongues, and glue blocks on the face to pull the mitres up. When these have been made to fit, and the rim is perfectly square, take it to pieces and mitre in the air-tight fillets, which should be glued in and allowed to set before the fascia is put together permanently. No hard and fast line can be drawn with reference to the shape of the cornice moulding, which should be next prepared. Plough it on the back for a tongue, and mitre it round the cornice and glue it in its place, also fixing it with fine screws from the back side, or putting fine panel pins in the square portion of the moulding on the face. When the glue is set, take off the hand screws, etc., and put on the cover board, which should be of dry pine, and fix it with fine screws from the top. Turn up the cornice on its top, and fit in and fix with panel pins pieces of pine the same thickness as the air-tight fillet.

The material for the side sashes must be good, straight-grained mahogany, free from knots. Measure off what is required—namely, eight stiles 4 ft. 2 in. long, four rails 4 ft. long, and four rails 6 ft. long and of the requisite widths, as shown on the setting out. The method of jointing the angles of the sashes is shown by Fig. 82. These need very careful fitting: Hook joints must be worked on the side of one of the front sash stiles, and on the shutting stile of the side sash, the air-tight bead being formed on the hanging stile. Prepare the four stiles, $2\frac{1}{2}$ in. wide, $1\frac{5}{8}$ in. thick, face them up true and straight, and gauge them to $2\frac{3}{8}$ in. finished size. Also prepare two rails 6 ft. long, $1\frac{1}{2}$ in. full finished width, and $1\frac{3}{8}$ in. thick, and two of the same length $1\frac{1}{4}$ in. bare finished width. Set out these two sashes 5 ft. $10\frac{1}{2}$ in. to outer edge, which is the exact width of the deal frame and fascia. In setting out the rails, therefore, the distance between the shoulder lines should be 5 ft. $6\frac{1}{2}$ in. The tenons on these rails should be cut about $1\frac{1}{2}$ in. in length, as they, if mortised through end grain, would look unsightly; the mortises should be stopped accordingly, so that they do not go through the stile. A tenon going two-thirds through the stile, if well fitted and glued, will be a perfectly sound and lasting joint.

Work the moulding and rebate as shown in Fig. 82. Rebate out the two end stiles in pairs, $1\frac{3}{8}$ in. on and $\frac{1}{2}$ in. deep; plough in the centre for an eighth tongue, and work the bead on the edge, also the one on the face which is sunk. Square the moulding lines of the top and bottom rails of sash across the face, and work the ovolo moulding on the angle, stopping it at the lines mentioned with a bevelled stop, as shown in Fig. 83. Be careful to leave sufficient on either end of the stiles for forming the 1-in. tenons. The hook joint on the left-hand stile must be worked, as previously described, with a $1\frac{1}{2}$-in. hook-joint plane. It is imperative that the stiles should be well fixed, in order that the whole thing may be rigid when finished. Work the ovolo moulding on the angle and stop it as before explained. In preparing the hanging stile, all that will be necessary beyond the usual procedure will be to plough for the air-tight bead.

Before glueing up the side sashes, make sure that the outer edges of the rails are perfectly square, so that they form a perfect joint when in their places. After they have been glued up and allowed to dry, clean off on both sides and form the tenons on each end of the stiles, the shoulders being the outer edge of the rails; then work on the inside the hollow to receive the round of the air-tight fillet. If any difficulty is experienced in getting these sashes in their places, shorten the tenon to $\frac{3}{4}$ in. For the sash for the opposite end (Fig. 82), the material required will be two stiles $1\frac{3}{8}$ in. square, one rail $1\frac{1}{2}$ in. by $1\frac{3}{8}$ in., and another $1\frac{3}{8}$ in. by $1\frac{3}{8}$ in. Frame them together, plough the outer edges for the tongue in the rebate, and form the tenons in all respects similar to those for the side sashes. Next prepare the front hanging sash with the hook joint and bead stile, allowing the stile sufficient width to form the joint. Put a double tenon on the ends of the left-hand rails. No tenons will be required on the stiles. When all the sashes have been prepared and fitted, put them into the mortises prepared for them. The fixed sash at the end may be secured by means of screws through the stile of the side sash, turned pateræ being provided to cover the screw-heads. This joint should not be glued unless it is to be fixed permanently, as the tongued joint itself is, if properly made, sufficient to exclude all air. Fix both side sashes in this way and drop on the cornice and fit in the hanging sash. This done, put in the glass, which should fit tightly and be bedded on a thin layer of putty. Fix packing pieces where required to keep the case square and the frame perfectly straight. Fix on the beads with fine panel pins, clean off all superfluous putty; the case will then be ready for the polisher. The inside of the top should be lined with white lining-paper, the bottom with velvet plush or other suitable material. Brass standards may be erected in the centre to carry glass shelves, if required.

(To be continued.)



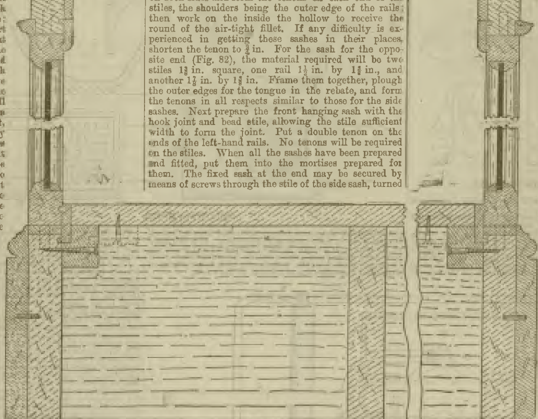


Fig. 81.

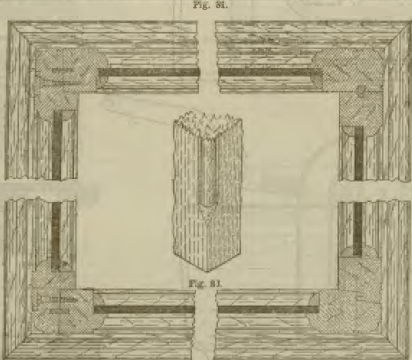


Fig. 83.

Fig. 82.

Air-tight Case Making. Fig. 81.—Vertical Section of Case. Fig. 82.—Horizontal Section of Case made in Sections. Fig. 83.—Stopped Moulding on Angles of Case.

The Main Drainage of South London.—The main drainage of South London is effected by three large intercepting sewers and their branches. The southern high level sewer drains a part of Wandsworth, as well as Clapham and Camberwell, and then passes by way of New Cross to the west side of Deptford Creek, where it unites with the Effra branch sewer, which passes through Streatham, East Dulwich, and Nunhead. The length of the high level sewer is $5\frac{1}{4}$ miles, and its size varies from $4\frac{1}{2}$ ft. by 3 ft. to a diameter of $10\frac{1}{2}$ ft. The Effra branches are $7\frac{1}{2}$ miles long, and the size varies from 1 ft. to $10\frac{1}{2}$ ft.; while the area drained by these two sewers amounts to 20 square miles. After this junction these sewers are carried under Deptford Creek in four large cast-iron pipes, and the sewage then flows along the southern outfall sewer to Crossness, where it is raised from 10 ft. to 30 ft., according to the state of the tide, and is thus carried into a reservoir, from which it eventually reaches the river. The remaining sewer, known as the southern low-level sewer, drains the low-lying districts extending from Putney, Wandsworth, Battersea, Lambeth, Walworth, and Camberwell to Deptford, while the low ground around Rotherhithe and Bermondsey is drained by the Bermondsey branch sewer. The length of the southern low-level sewer is $9\frac{1}{4}$ miles, and that of the Bermondsey branch $2\frac{3}{4}$ miles. The size of the low level varies from a diameter of 4 ft. to two culverts each 7 ft. by 7 ft., and the diameter of the Bermondsey branch varies between 5 ft. and 5 ft. 6 in. The area drained by the two combined is about 20 square miles. Both pass under Deptford Creek, and at the adjacent pumping station the sewage is raised by steam power to the height of 18 ft., and discharged into the southern outfall sewer. At the pumping station there are four engines, each of 125 horse-power, and the amount of sewage which can be raised each minute is 13,723 cub. ft. The length of the southern outfall sewer is $7\frac{1}{2}$ miles, and it is uniformly $11\frac{1}{2}$ ft. in diameter. Several defects in this system are plainly stated in the Joint Report on the Main Drainage of London, which was presented to the London County Council in 1891 by Sir Benjamin Baker, K.C.M.G., and Mr. A. R. Binnie, the present Chief Engineer to the Council. This states that "The collective discharge of the southern low level and Bermondsey branch sewers is about 11,000 cub. ft. a minute, which is lifted easily by the existing pumping plant of the Deptford station. The total discharging power, however, of the high level and Effra branch sewers is about 34,000 cub. ft. per minute, of which only 8,000 cub. ft. per minute can pass through the cast-iron pipes under Deptford Creek, so that when these two sewers are fully charged there must occur an overflow into the river at Deptford to the amount of 26,000 cub. ft. per minute. The total discharging power of the southern outfall sewer, extending from the pumping station at Deptford to Crossness, is about 19,000 cub. ft. per minute, but as this outfall sewer receives from the districts of Greenwich, Charlton, Woolwich, and Plumstead, between Deptford and Crossness, an estimated flow of about 4,000 cub. ft. per minute, its capacity to carry forward from Deptford to Crossness sewage flowing from the southern low level, high level, and Effra branches is only about 15,000 cub. ft. per minute." It is evident that in these two cases there is a very potent source of sewage pollution of the river.

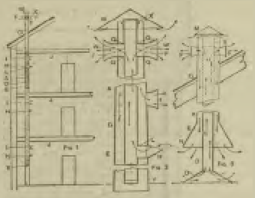
BUILDING WORLD PATENTS.

Complete Specifications Accepted and Published 13th March, 1897.

Persons interested in opposing the grant of a Patent on any of the undermentioned applications should give notice at the Patent Office, 25, Southampton Buildings, Chancery Lane, before April 19th, 1897.

Ventilating apparatus.—W. HEATON and J. RUMBALL, Bridgnorth. [5014—1896]

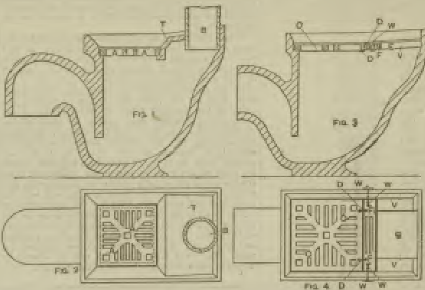
It is claimed that by the employment of the means of ventilation provided by this invention excessive down-draughts are remedied, an efficient and regulated circula-



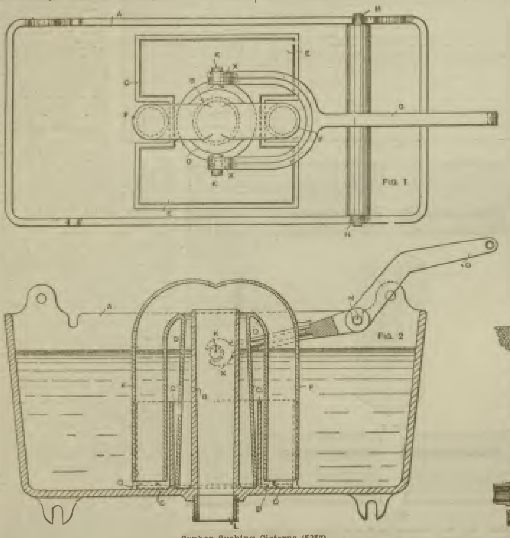
Ventilating Apparatus (5014).

tion of air is maintained, and the vitiated fumes are expelled.

Fig. 1 represents a sectional elevation of a three-roomed building with the improved apparatus applied thereto; Fig. 2 is also a sectional elevation, on a larger scale, showing the principle of the invention; Fig. 3 represents the apparatus as constructed for one room. A denotes a cylindrical metal tube (known as the "outer shaft") extending from the basement up and through roof C. D denotes a cylindrical metal tube (known as the "inner shaft") of less diameter than A; it extends the whole length or nearly so of the outer shaft, thus forming the intervening space E, D being provided with caps X at the top and Y at the bottom for closing the ends. Each of the shafts is provided with bell-mouthed tubes F, the ends being secured to inner shaft D at G, and they serve as inlets for cold air (as indicated by arrows), which is conveyed to inner shaft D, the ends of the inlets being covered with a network of wire. Each of the shafts is provided in each room with an inlet H and an outlet I; inlet pipes H pass through outer shaft A and are secured to inner shaft D at L. When a current of air enters tubes F from outside the building, it passes into inner shaft D and downwards, and through each inlet H into the room or rooms, and forces the vitiated air through each inlet I into outer shaft A. Ascending, it is expelled between the terminal cap M and the top of A. As shown by Fig. 3, which represents an arrangement more suitable for one room, the body of outer shaft A is shortened, the bottom of the same being converted into a funnel-shaped body N, which serves as an outlet. It is provided at its edge with a ridge, in order to receive any moisture that may arise from condensation in connection with the inner shaft D, at the bottom of which is a perforated dish O for the entrance of cold air to the room.



Gully Traps (10037).



Syphon-flushing Cisterns (5257).

Syphon-flushing cisterns.—J. P. O'DONNELL, Westminster, S.W. [5257—1896]

The object of the improvements in flushing cisterns effected by this invention is to obtain a more rapid discharge of water.

Fig. 1 represents a plan and Fig. 2 a sectional elevation of the improved apparatus. A denotes the cistern provided with a standpipe B and internal chamber C, the whole being formed in one casting. D is the cylinder surrounding standpipe B, and provided with a bottom plate E formed to fit in chamber C. F F represent the two suction pipes formed in one with cylinder D and joining at its top, the said pipes projecting downwards, outside chamber C, to near the bottom of main cistern A. G denotes the lever to which the chain is connected; the said lever has fulcrum pins or projections H H, which bear in notches formed in the sides of cistern A. The lever G has forked ends X X, which engage with pins K K formed on the sides of cylinder D. L is a screwed neck to which the usual discharge pipe is connected. When the cistern is full and it is desired to discharge its contents, the movement of lever G raises cylinder D with its suction pipes F F, and as long as the cylinder is in a raised position no discharge takes place; but as soon as the pull is released, allowing the cylinder to drop by gravity, the bottom E of the cylinder forces the water between the cylinder and the stand pipe B, and down the latter to the discharge pipe L at the bottom of the cistern, a syphonic action being thereby set up and the water drawn up each of the suction pipes F F until the cistern is completely emptied.

Gully traps.—J. RICHARDS, Cardiff. [10037-1896]

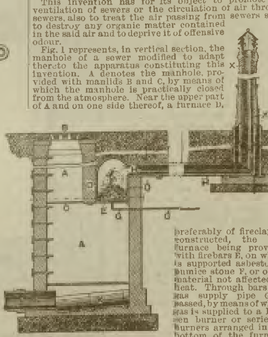
The claims made in respect of this invention refer to the movable grated part and the fixed part of the cover; also to the method of delivering waste water from a fall pipe into trap, below the cover thereof.

Fig. 1 represents in vertical section, and Fig. 2 in plan, a gully trap made in accordance with one arrangement comprised in this invention. The cover consists of a movable grating A and a fixed part T, which latter may be made in one with the body of the trap. In the fixed part is an aperture through which the fall pipe B is passed and extended down to a suitable length below the cover of the trap. By this means the trap is, therefore, self-scouring. When more than one pipe discharges into such a gully, separate apertures for each are provided in the fixed part T. Fig. 3 represents in vertical section and Fig. 4 in plan a modification. The grating is divided into two parts C and F, of which the part C is hinged by wires D to part F, which latter is secured by wires W to the sides of the trap. The aperture E for the fall pipe is provided in the fixed part V of the cover. The aperture is shown as rectangular to take a rectangular fall pipe, but it would be otherwise shaped to take a different shaped fall pipe. The part C of the grating can be raised on hinges D to give access to the interior of the gully trap without necessitating removal, and the whole grating C and F cannot be removed from the trap without detaching it from the fastenings W which secure it to the body of the trap.

Ventilation of sewers.—E. HOLMES, Birmingham. [7148—1896]

This invention has for its object to promote the ventilation of sewers or the circulation of air through sewers, also to treat the air passing from sewers so as to destroy any organic matter contained in the said air and to deprive it of offensive odour.

Fig. 1 represents, in vertical section, the manhole of a sewer modified to adapt thereto the apparatus constituting this invention. A denotes the manhole, provided with manlids B and C, by means of which the manhole is practically closed from the atmosphere. Near the upper part of A and on one side thereof, a furnace D,



Ventilation of Sewers (7143).

preferably of fireclay, is constructed, the said furnace being provided with firebars E, on which is supported asbestos or pumice stone F, or other material not affected by heat. Through bars E a gas supply pipe G is passed, by means of which gas is supplied to a Bunsen burner or series of burners arranged in the bottom of the furnace. The upper part of the furnace is connected by a flue H, preferably of glazed earthenware, to a vertical shaft X. The contaminated air from sewer K can only escape into the atmosphere through the furnace D, flue H, and shaft X. The gas supplied to the burners being ignited, the asbestos or pumice stone F is raised to a state of incandescence, so that the vitiated air from sewer K, in passing through furnace D, is raised to such a temperature that all organic matter is burned, and any oxidisable material and other offensive gases are, by their oxidation, converted into inodorous compounds.

BUILDING WORLD,

AN ILLUSTRATED WEEKLY TRADE JOURNAL.

NO. 76.—SATURDAY, MARCH 27, 1897.

All communications intended for insertion in this Journal should be addressed to the Editor of BUILDING WORLD, CASSELL & Co., *Limited, London, E.C. The name and address of the writer must always be given, not necessarily for publication.*

Correspondents should be brief, write on one side of the paper, and send drawings on separate slips. Editorial and publishing matters should be kept distinct.

Contributions are always welcome, but the Editor does not undertake to return manuscripts or drawings unless stamped and addressed envelopes are enclosed for the purpose.

BUILDING WORLD *is published at La Belle Sauvage, Ludgate Hill, London, at 2 o'clock every Thursday afternoon, and should be obtainable throughout the United Kingdom on Friday at the latest.*

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(*Sent post free weekly to any part of the world.*)

3 months, 1s. 8d.; 6 months, 3s. 3d.; 12 months, 6s. 6d.

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LETTERS TO THE EDITOR.

PAINTING A RUSTY DRINKING-WATER TANK.

SIR,—The contention of Mr. WHYATT (see No. 75, p. 383) is very pertinent if the cistern is to contain soft water. The same objections would hold good to a cistern lined with sheet lead, or to an iron cistern galvanised or coated with zinc. Residing in a limestone district where we have no lead-poisoning troubles, I must admit that my reply (No. 74, p. 333) was written without reference to soft water and its possible corrosive action upon the paint; but if the cistern is prepared as advised by me, and given a couple of coats of bath enamel (enamels are not usually, I believe, prepared with a lead basis), I do not think even soft water will be very seriously affected, if at all. The objection to the use of an oxide of iron paint is its colour: it is preferable to coat a cistern with some light colour, so that the presence of impurities may be easily detected.—SANITAS.

CUTTING POCKETS IN SASH FRAMES.

SIR,—In reply to T. W. (*Birchfield*), whose letter appeared in No. 72, p. 335, I should like to suggest that T. W. should put my method to practical proof, as it seems to me very probable that he has not done so, judging from the manner in which he criticises it. He will then find that in cutting the ends of the pocket with the chisel the grain will become compressed; so that if he adopts that "novel idea" of mine—namely, dipping the ends in hot water (not soaking them in it for an hour or two), he will find that the so compressed fibres will swell to their proper size.

On reading the letter by H. (*Walsall*), in No. 73, p. 351, I find his greatest difficulty is to select stuff suitable to have the pocket in the centre of the stile; yet there is really no difficulty in obtaining suitable stuff. If it were necessary to rigorously avoid knots, as H. states it is, then I could understand his trouble, but there is no such necessity. We have often to cut through knots in the sides of the pocket piece, and with a little care in arranging the pockets, knots may be easily avoided at the ends; for there is no hard and fast rule as to the height of the pocket from the sill, or as to the length of the pocket, which may be varied an inch or two, to suit the circumstances.

I may say that hundreds of frames are made in our shop annually, and I have not yet seen a new pocket piece got out for one of them.

H. (*Walsall*) also states that in good work the pocket may be cut out of the centre; and yet he supports T. W. by saying that the paint will crack off the edge that is not hidden by the bottom sash. It appears to me that if this be the case the method would be more suitable for cottage work than for work of superior quality.

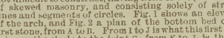
I have seen the centre method adopted in mansion and hospital throughout the buildings, and have renewed the cords; but I have never had the misfortune to find it make such a ragged mess of the paint as T. W. and H. suppose.

If the frames H. is making were of pitch pine, and he had to match the grain of the stile with his new pocket pieces, I am inclined to believe that he would try a method by which he could make the same piece do; and I would strongly recommend him to try mine in preference to T. W.'s with the oak cleat, as that would be much more expensive, and then not superior. I should also advise him to dip the ends in hot water, as in the result he would find that proceeding a very happy 'subterfuge" instead of a "sorry" one.—W. H. S. (*Northampton*).

HOW TO MAKE AND FIX A HALL DOOR AND FRAME.

SIR,—Referring to the criticism of H. (*Walsall*) in No. 74, p. 367, upon the article headed as above, it appears to me that the mistake is in the illustration, where the elevation of the door and framing shows the top of the lock rail carried in a line with the top of the rail of framing E E (Fig. 1, p. 253, No. 68), which is set out as 3 ft. 3½ in. high, including the 2¼ in. allowed as thickness of the rail. This appears to me to have been set out wrongly—for, taking the height of the lock rail of the door to be 3 ft. 1 in. (a convenient height), and taking into consideration the fact that the top of the rail of the framing E E should carry the line of the rail of the door, then, in setting out the framing, the 2¼ in. allowed for the thickness of the rail should have been set back within the height of 3 ft. 1 in. and not beyond it, as shown. This would then make the elevation of the door agree with Fig. 7 and the text of the article; Fig. 3 would also have to be altered to correspond.

I agree with H. (*Walsall*) that some of the sizes of material are exceptional; but I would point out that he

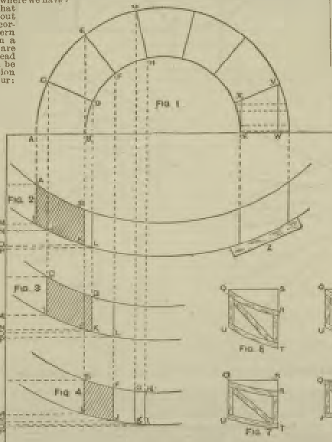


Method of Cutting Diminished Stiles.

is mistaken in assuming that the two door stiles, each 4½ in. wide, could not be cut out of 9-in. material, because it is easily done, as a glance at the accompanying sketch will show, and in most shops it is the common practice to rip out diminished stiles in this way. The sketch shows that even wider stiles than those required in the present instance can be cut from 9-in. stuff.—KENTISH JOINER (*Maidstone*).

ARCH UPON CIRCLE STONECUTTING.

SIR,—The arch shown in the accompanying sketch is not difficult to construct, having none of the peculiarities of skewed masonry, and consisting solely of straight lines and segments of circles. Fig. 1 shows an elevation of the arch, and Fig. 2 a plan of the bottom bed of the first stone, from A to B. From I to J is what this first stone gains on the circle to the joint C; from K to L is the projection to D on the joint; from J to L equals the projection at C D; and M N and O P show what is gained on going round the circle. By dropping perpendicular lines from the bottom bed to I, and from C to J, B to K, and from D to L, and squaring from these lines where



Arch Upon Circle Stonecutting.

they intersect with the plan, the proper curves for all the different moulds are obtained. Figs. 3 and 4, showing the second and third stones, are produced in the same way. Fig. 5 is the bed-mould of the first arch stone. Q R equals A B, S R equals M O, R T equals B K, and U T equals I K. Fig. 9 is the arch face mould; and the first stone is shown wrought, the two upright lines X Y and V W being draughted straight and square with the bed both ways, and out of twist. The curved rule or template Z (Fig. 2) is applied, also out of twist, in the two places shown by the dotted lines, always parallel to the horizontal; when these lines are run, the arch stone can be cleaned off. Every horizontal line on the whole arch must be worked to the mould Z, and every perpendicular is a straight line; and, if these instructions are followed, when the centre of the keystone is reached it will be found to be straight, plumb, and square with the soffit.—EX-CRAFT (*Glasgow*).

"BUILDING WORLD" CALCULATED TO RAISE THE STANDARD OF EFFICIENCY IN WORKMEN.

SIR,—BUILDING WORLD is, I think, a most excellent trade paper, and in these competitive days it supplies a long-felt want. It is a great boon to all who carefully study its interesting pages, as it imparts valuable information hitherto difficult to obtain; and it is, in my opinion, well calculated to raise the standard of efficiency in workmen who study its pages. It would be to the advantage of workmen of every degree to read the paper, as anyone cannot fail to benefit from it. If you will send me a few specimen copies, I shall be pleased to distribute them in this district, as I am in constant touch with many country mechanics who would be very glad, no doubt, to obtain a copy.—Wishing BUILDING WORLD the success it so richly deserves,—SHOP FOREMAN (*Loose*).

[The parcel of specimen copies has been sent, as requested; and we shall be pleased to forward a similar parcel, carriage paid, to any reader who will undertake to distribute the contents among persons likely to become subscribers.—ED.]

POLISHES, VARNISHES, AND STAINS, AND HOW TO APPLY THEM.

SIR,—Having gained much valuable information and instruction from BUILDING WORLD, I, in my turn, should like to contribute a few recipes which joiners, undertakers, etc., may find useful when unable to obtain the ready-made liquids. Having worked from these recipes for the last seventeen years, I can testify that they are trustworthy.

In polishing, first saturate a rubber of cotton wadding with polish, covering the wadding with linen to prevent dragging. Add a few drops of raw linseed oil when the rubber commences to click, and rub smartly until a good body and face appear on the work, which should then be left for five or six hours, when the polishing is repeated with soft rubber (not using too much oil), until the face is obtained. In spiriting off, take a new rubber, saturate it with methylated spirits or wood naphtha, and pass it lightly and smartly over the work from one end to the other until the rubber appears dry, continuing until the face is restored and the work appears satisfactory. The spiriting hardens the work, which should not afterwards shrink.

To make *brown polish*, dissolve 4 oz. of orange shellac in 1 pt. of methylated spirits. For *red polish*, dissolve 4 oz. of shellac in 1 pt. of methylated spirits, adding 1 oz. or more of dragon's blood, according to the depth of colour required. For *white polish*, dissolve 4 oz. of white shellac in 1 pt. of methylated spirits; this is for black or white work. In preparing these polishes, break up the shellac and dry it well before a fire, then put in the methylated spirits, allowing time for the shellac to dissolve before using. The polish should be kept in a well-corked bottle, and used in a room of moderate temperature. Wood naphtha may be used instead of methylated spirits when it is found impracticable to keep the polish in a room, as, for instance, when polishing the handrail of a staircase. In polishing, the rubber may be followed with a warm iron, keeping it a suitable distance from the work to prevent it from turning green.

For *glazing*, prepare the rubber in the same manner as for polishing, but make it much wetter, and pass it smartly over the work from right to left, always commencing at the same end of the work, bringing the rubber straight from one end to the other in one stroke, and not going too often over one spot, or the work may "tear up." Glazing is used for common work in place of spiriting, or in cases of emergency. A rubber of spirits passed quickly over a job that has been glazed improves it very much, and makes it smooth; but the rubbing must be done lightly and quickly from one end to the other. The glaze may be made by mixing 1 oz. of benzine in ½ gill of methylated spirits.

For *black stain*, boil together 4 oz. of logwood, 1 pt. iron liquor, 1 dram of copperas. *To stain light mahogany dark*, mix 2 drams of bichromate of potash in 1 qt. of water. *A mahogany stain for deal* consists of 4 oz. of Venetian red, 1 oz. of glue, and 1 qt. of water, boiled together; this should be applied lightly with a brush, and, when dry, should be sand-papered off, as it looks better when the grain can be discerned. Colour the putty to suit, then varnish. *Red varnish* consists of 1 pt. of methylated spirit, 4 oz. of shellac, 3 oz. of resin, 1 oz. of benzoin, 1 oz. of dragon's blood. This must be applied with a camel-hair brush or mop, rubbing the work with very fine sand-paper before giving the last coat of varnish; two, and sometimes three, coats are required. *Brown oak stain* consists of 4 oz. of vandyke brown, 1 pt. liquor ammonia, 1 oz. of bichromate of potash. *Brown varnish*, 1 pt. of methylated spirit, 4 oz. of shellac, 3 oz. of resin, 1 oz. of benzoin. *Walnut stain*, 4 oz. of vandyke brown, 1 pt. of liquor ammonia. *Rosewood stain:* Stain first with strong logwood water, and put the figure in with a feather and a little copperas water, then use red varnish. *Bronze:* Give a coat of white or brown varnish, then dust over with bronze powder, with a sheet of paper beneath to catch all that falls.

White varnish: 4 oz. of white shellac, 1 pt. of methylated spirit, 1 oz. benzoin, 1 oz. of white resin, 1 oz. gum mastic, ½ oz. gum sandarach. *Black varnish:* 4 oz. of white shellac, 1 pt. of methylated spirit, 1 oz. of benzoin, 1 oz. of white resin, 1 oz. gum mastic, ½ oz. of gum sandarach, 1 oz. vegetable or gas black. *Black polish:* 4 oz. of white shellac, 1 pt. of methylated spirit, 1 oz. of vegetable or gas black. *Transparent varnish:* put 4 oz. of gum thus into a pot and simmer it in an oven, let it get cold, then crush it up. Put into a pint of methylated spirit with 2 oz. of gum sandarach. This varnish must be used in a warm room, and is for paper and oil paintings. For bleaching and taking stains out of wood, use 1 oz. of oxalic acid, 1 gill of boiling water. This should remove any stain; but should it fail, try a little spirits of salts. *Bismarck brown* may be used for staining red polish; 1 oz. of this is enough to colour a gallon. *Reviver:* 1 gill of methylated spirit, 1 gill of vinegar, ½ gill of raw linseed oil. All varnishes or polish should be strained before using. If used in too cold a room, the work will turn of a greenish cast. Red sanders wood or cam wood may be used in place of dragon's blood.—A JOINER (*Merbro'*).

[Readers interested in this subject are informed that the new WORK handbook on "Wood Finishing," comprising Staining, Varnishing, Polishing, etc., with illustrations, is now ready, bound in cloth, price one shilling. It contains full instructions upon staining (see the advertisement, p. 15 of supplement).—ED.]

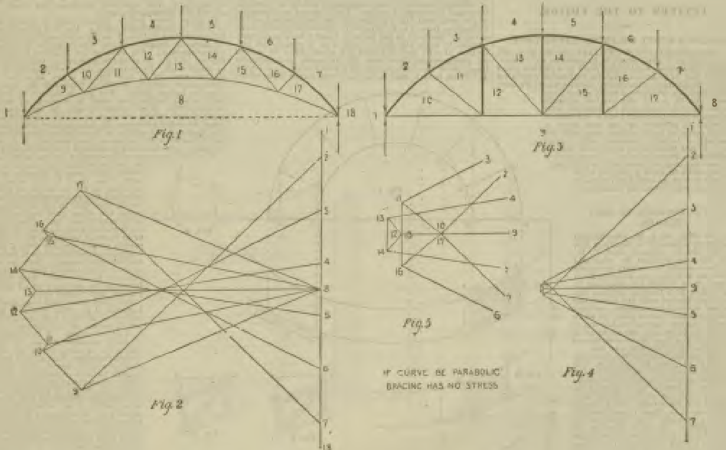
QUESTIONS AND ANSWERS.

Readers are invited to avail themselves of this section for information of any kind within the scope of BUILDING WORLD. Selected questions of general interest will be printed together with concise replies furnished by reliable authorities. Questions considered to be of merely personal interest will be answered by a personal note in "Answers to Correspondents." Answers are not sent by post. Questions not satisfactorily answered should be repeated.

[964] **Action of Mineral and Sea Waters on the Metals used by Plumbers.**—OSWALD (*Oswestry*) writes: —"Please advise as to the action of mineral and sea waters on the metals used by plumbers."

— The action of mineral waters on lead varies according to the properties of the matter in solution. If water contains any chlorides, nitrates, or ammonia, a corrosive action is set up, but the corrosion is diminished by the sulphates, the phosphates, and the carbonates. The metal is dissolved in water highly charged with carbonic acid, owing to the solubility of plumbic carbonate in excess of carbonic acid. Sea water has very little action upon lead, as an insoluble compound forms on the surface which protects the metal beneath.—J. WRIGHT CLARKE.

[965] **Calculating Stresses and Strains on Braced Iron Roof Truss.**—E. JACQUET (*Liége*) writes:—"Please explain the method of calculating the stresses in the braced iron roof truss of which a sketch is enclosed."



Calculating Stresses and Strains on Braced Iron Roof Truss. By Henry Adams (No. 965).

— In the first case (Fig. 1) all the members except the principal rafter are in tension, as shown by stress diagram (Fig. 2). In the second case (Fig. 3) the principal rafter and the vertical bars will be in compression, the remainder in tension. Fig. 5 is an enlargement to show the junctions of Fig. 4 more clearly. If the load lines be drawn to scale, the stresses under any given loads may be measured off. If allowance is to be made for wind blowing sideways, the funicular polygon must be used.—HENRY ADAMS.

[966] **Measuring Painting Work to Window.**—B. H. K. (*Ilfracombe*) writes:—"What is the method of measuring the painting work to a window, inside and outside: (1) with boxing shutters, elbows, and back; (2) with merely a window board and architrave?"

— The face of a window is sometimes measured superficially, as though it was a plane surface, and doubled for outside. If the panes are small, they may be reckoned at so much a dozen per coat—say, 1s. All surfaces under 12 in. wide to be measured as though a foot wide. Boxing shutters are measured superficially.—DOM PEDRO.

[967] **Truncated Span Roof, with Asphalt Top and Slate Slopes.**—J. D. (*Edinburgh*) writes:—"Please supply details of construction of the roof, of which a rough sketch is enclosed [not reproduced]. The roof is slated, and, in shape, a truncated span, the flat top being covered with asphalt."

— If this is an existing structure, obtain the details by inspection; if not existing, its adoption cannot be recommended, as trusses must be formed, or the joists must be trussed, or heavy and deep-rolled iron joists must be used; and it would be difficult to get a satisfactory joint between the edge of the asphalt and top of the slates. A lead flat might be used instead of asphalt.—HENRY ADAMS.

[968] **Painting Sheet Copper.**—W. T. P. (*Freemantle*) writes:—"Please describe the best way to mix paints to lay on sheet copper."

— For painting sheet copper, the colours required should be ground in linseed oil, or the paint may be bought in this condition from a colour shop. It should be mixed with about an equal quantity of boiled oil, and then made rather thin with turpentine. The paint adheres better if both the copper and the paint are made hot before application. Enamel paints, such as Aspinall's, are suitable for protecting sheet metal; and, as transparent coatings and for decorative purposes, the coloured spirit varnishes are largely used.—H. B. S.

[969] **Coil Failing to Heat.**—ONE IN A FIX (*no address*) writes:—"In the cylinder system hot water apparatus, with coil connected up, as shown in the enclosed sketch, the coil will not heat. Please advise as to cause and remedy."

— The sketch is not reproduced, as it shows only an ordinary apparatus on the cylinder system, with a coil connected off the primary flow and return just before they enter the cylinder. The fault is that the cylinder offers the freest way for the circulation, and the coil, which is 24 ft. away horizontally, is neglected. Probably the hot water would come along to the coil after the contents of the cylinder were hot; and it is possible that the coil could be made hot if the fire was forced. The boiler, being only 12-in., and of the ordinary square kind, the 35-gallon cylinder will demand from it all the work it can well do without the coil. A boot boiler, with a slight alteration to the coil branch (to favour the circulation that way), would effect a cure; but if this is not possible, then a stop valve should be put in the main flow-pipe to check the circulation into the cylinder, and make the water pass along to the coil. A stop-valve in the flow-pipe only is not a source of danger in itself, but it should be accompanied by a safety valve on the boiler. Is the stop valve that exists in the coil service a full straight-way one? If not, it may be one that stops the circulation unless it is fixed on its side.—F. DYE.

[970] **Details of Wooden Roof Construction.**—J. E. C. (*Bradford*) writes:—"Kindly say if it is necessary, in a building construction examination, to represent the king and queen posts as cut to the shape shown in the diagrams that appear in BUILDING WORLD—in No. 73, at p. 347, Fig. 304, for instance. In Yorkshire the king and queen posts are not cut at the sides, nor are the ceiling joists notched to the tie-beam."

— The method of using the king and queen posts without cutting at the sides is common throughout Yorkshire, but is never seen in London except in the roughest work. It adds to the weight of the truss, does not increase the strength, and is considered unsightly, but saves a little labour. The purlins should be at right angles to the principal rafter, to take the load from the common rafters, which, being held at the top, press in that direction, and not vertically. With regard to ceiling joists, the standard text-book, "Notes on Building Construction," vol. i., says: "When a ceiling is required, the joists to support it are generally notched and nailed to the under side of the tie-beam." This is, however, seldom done, as the only advantage is the saving of an inch of head-room.—HENRY ADAMS.

[971] **London County Council and the Testing of Drain Pipes.**—J. J. (*Southall*) writes:—"What are the London County Council regulations as to testing sanitary earthenware pipes?"

— The London County Council have not yet issued any regulations with regard to drainage, but they have such rules under consideration, and on p. 365, No. 74, of BUILDING WORLD, will be found a paper on the subject that was read by Mr. J. P. Barber, M.I.C.E., at a meeting of the Society of Engineers at the United Service Institution on March 1.—J. WRIGHT CLARKE.

[972] **Stresses in Girders.**—F. D. (*London, S.W.*) writes:—"In reply to Question 917, in No. 72, p. 336, it is said concerning the second diagram that 'Bar 1-7 has first the two tons over it passing directly through to the support, and then it has three-fifths of the load 3-4.' Why should it not also have some part (say four-fifths) of load 2-3?"

— In the answer to question 917, p. 336, bar 1-7 has no portion of the load on 2-3 passing through it, as the latter is transmitted by the struts downwards on the other series of triangulations. It will be observed that there are two independent sets of bars, or, as it were, two Warren girders superposed.—HENRY ADAMS.

[973] **Capacity of Pipe for the Drainage of a 12-Roomed House.**—J. R. K. (*Kimberley*) writes:—"Please supply a solution to the following examination question: 'What sized pipe would you recommend for the drainage of a 12-roomed town house; at what inclination should it be laid? Give its discharging capacity when running full; the maximum quantity likely to pass through it at any period of the day, under ordinary circumstances, and the velocity of the maximum flow.'"

— In dealing with the first part of the question, the number of people living in the house has first to be considered. In a 12-roomed town house there would probably be six bedrooms, and allowing two people to each of these would show twelve residents. Taking 30 gal. per head as the daily consumption of water, there would be 360 gal. (plus about 1 gal. for excreta and similar matters) to get rid of. Of this quantity the greater portion would pass through the drains in the morning part of the day, when baths and sinks are being used. In the middle of the day, or in the evening, according to the hour of dining, another considerable quantity would be used, and between those times there would be very little. The size of the drains should be judged from the maximum discharge. Assuming that both a sink and a w.c. are all used at the same instant of time, and that a 40-gal. bath takes about three minutes to empty, this gives 13⅓ gal. to get rid of in one minute; a water-closet using 3 gal. usually takes about five seconds to flush, or a discharge at the rate of 36 gal. per minute; and a 3-gal. pailful of water would take about ten seconds to run through the grating of a flat-bottomed sink and down the waste pipe, giving a discharge rate of 18 gal. per minute. These amounts added together = 13⅓ + 36 + 18 = 67⅓ gal., and the drain must be large enough to discharge that amount per minute. Drains should be laid to a fall which would give sufficient velocity to scour away sand and other sediment, but not to such a great fall that the water would travel at a high speed in a thin attenuated stream which would not have sufficient depth to float fæcal and similar matters away. By experiment it has been found that a 4-in. drain with a fall of 1 in 92 gives a velocity of 3 ft. per second and discharges 96 gal. per minute, and a 3-in. drain with a fall of 1 in 69 gives the same velocity and discharges 54 gal. in the same time. But in town houses the rainfall has to be dealt with in addition, and the drain must be increased in size, in proportion to the area of the house and surroundings which catch the rainfall. In practice it has been found that a 5-in. coated cast-iron pipe drain laid to a fall of 1 in 50 is equal to the requirements of an ordinary 12-roomed terrace house. Mr. Hawksley's formula for calculating the discharge through drains is:—

$$V = \cdot 77 \sqrt{\frac{H D}{L + 2\frac{1}{2} D}}$$

Where
V = velocity in yards per second.
H = head in inches.
D = diameter of drain in inches.
L = length of drain in yards.

—J. WRIGHT CLARKE.

ANSWERS TO CORRESPONDENTS.

All querists should consult this column. Questions not satisfactorily answered should be repeated.

*** Back numbers of BUILDING WORLD out of print:—Nos. 1, 2, 3, 4, 5, 6, and 7; also Part I. and Vol. I. All other back numbers may be obtained for 1½d. each, post free from the publishers.

THE INDEXES to Vols. I. and II. may be ordered through any newsagent, price 1d. each, or may be had post free from the publishers, price 1½d. each.

THE SIX SUPPLEMENTARY PLATES issued with the monthly parts forming Vol. II. may be obtained through any newsagent for 1s., or post free from the publishers for 1s. 1½d.; or they may be obtained separately for 3d. each through a newsagent; or for 3½d. each, post free, from the publishers.

CASES FOR BINDING the volumes of BUILDING WORLD can be had to order through any bookseller, price 1s. 3d. each.

ALL COMMUNICATIONS should be addressed to *The Editor*, BUILDING WORLD, La Belle Sauvage, London, E.C. We cannot undertake to deal with letters directed to any contributor. It is particularly requested that no stamp be enclosed, as we do not reply by post.

L. J. R. (Dover).—Information upon bronzing gas-fittings will be found in No. 387, p. 83, of *Work*.

A. B. (Glasgow).—The only method is to calculate the superficial area of the section, and multiply this by the circumference (equal to 3⅐ times the diameter), and the product in cubic feet by 450 for cast-iron, 480 for wrought-iron, and 489·6 for steel. The answer will be in pounds.

FIBULA (Church Stretton).—Your sketches are not very clear; but cutting back the tiling and inserting a small lead gutter behind the skylight will probably overcome the trouble.

T. F. (Wigton).—Purchase's "Practical Masonry," 7s. 6d. (Crosby Lockwood & Son), will be useful to you. Glad to know you find "good information" in BUILDING WORLD.

MASON (Todmorden).—The Newcastle Chilled Shot Co., Ltd., 4, Bishopsgate Street Within, London, E.C., are makers of chilled shot. Steel saw plates may be obtained from J. Marx & Co., 133, Finsbury Pavement London, E.C.

AJAX (Aintree).—As far as can be said, according to the meagre details supplied, an equal opposite force will be requisite.

RIGHTAWAY (Bodmin).—(1) The ground would probably be sold by its surface measurement. (2) Box's "Hydraulics" (Spon) may suit you.

J. E. (Liverpool).—The calculations mentioned are what are termed "short cuts," and are not usually found in any book on arithmetic. Howard's "Art of Reckoning" (Cassell & Co.); and "The Timber Merchant and Builder's Vade Mecum," 4s. (Riders & Son), will be useful.

SHOP FOREMAN (Loose).—The specimen copies have been sent as desired. Thank you for undertaking to distribute them.

R. H. B. (Nottingham).—We cannot at present spare room to comply with your suggestion.

IMPROVER (Bayswater).—As you will doubtless have seen, your question was answered in No. 75, at p. 384.

H. B. (Pudsey).—Multiply the length of the trench by its breadth and the result by the average depth, when, if the measurements are feet, the answer will be in cubic feet. In the case mentioned $30 \times 15 \times 2\frac{1}{2}$ $(3 + 2 \div 2 = 2\frac{1}{2}) = 1{,}125$ cub. ft. $\div 27 = 41$ yd. 18 ft. See question and answer 631 in No. 51, p. 393.

J. S. (Glasgow).—We hope presently to be able to deal with the subject named in your letter.

J. R. (Torquay).—Glad to know you consider BUILDING WORLD "a complete guide for the building trade." The specimen copies have been sent, as requested.

M. H. A. (Gateshead-on-Tyne).—In ordinary circumstances the receiving of the keys by the proprietor would be evidence that the building was finished fit for habitation.

OLD SUBSCRIBER (Liverpool). If the slates are selected for size, and the widest are used at the eaves, the width of the courses must diminish as they approach the ridge.

VERITAS (Nelson).—Perhaps a cap in the shape of an inverted saucer will suffice. Try it upon one of the tubes and note the result.

W. J. D. (Wigan).—"How to Make and Fix a Hall Door and Frame" is the subject of an article in No. 68, p. 253.

GRAPHICS (Devonport).—We are at all times glad to receive items of practical interest to BUILDING WORLD readers.

ANXIOUS (Bensham).—We cannot undertake to give advice upon the subject of investments; but information about the material is given in No. 67, p. 246.

B. T. (Sheerness).—We should be glad to consider really practical articles upon the subject you mention.

W. H. S. (Bridgnorth).—Apply to L. Upcott Gill, 170, Strand, London.

DUST BAG (Oldham).—We do not think any such book as you inquire about has been published, but articles that will be useful will be found in No. 11, p. 161; No. 16, p. 245; No. 22, p. 341; No. 34, p. 370; and No. 31, p. 65, of BUILDING WORLD.

C. J. (Edinburgh).—Local considerations govern prices, but some information may be gleaned from a study of Laxton's, Lockwood's, or Spon's price books for builders, obtainable through any bookseller for 4s. each.

W. T. (Midsomer Norton).—It is usually stipulated that the lowest or any tender will not necessarily be accepted; but if there has been a breach of any agreement in the matter inquired about there is ground for claiming compensation, which, however, cannot be estimated at a percentage upon the tender. Better consult a solicitor.

A. E. (Huntingdon).—Add ½ pint of linseed oil to the pail of wash.

TONY (Carmarthen.—Put a layer of lime concrete (better use cement if exposed to the weather), 9 in. to 12 in. thick over the crown. This will conserve the heat.

C. H. (Abergavenny).—See notices in the supplement to this issue of Hermann's and the Cameo Wood Carving Co.'s exhibits at the Building Trades Exhibition.

TIMBER (London, W.).—In hard woods the average waste might be calculated at about 20 per cent.

PERPLEXED (Birkenhead).—Lengthening the flue pipes might improve matters; but in the peculiar circumstances a local expert should be called in to advise as to what is best to be done.

PERSEVERANCE (Hayward's Heath).—"The Slide Rule and How to Use It," 2s. 6d. (Crosby Lockwood & Son), is the book you inquire about.

ANXIOUS ONE (Shipley).—Purchase's "Practical Masonry," published at 7s. 6d. by Crosby Lockwood & Son, of Stationers' Hall Court, would probably serve your purpose.

OIL (Bournemouth).—Apply to the Britannia Works, Colchester, stating your requirements.

COMMUNICATIONS received up to the first post on Wednesday last and not otherwise acknowledged in this issue:—

W. J. G. (South Shields), J. W. G. (East Dulwich), J. W. N. (Strood), G. A. (Grimsby), P. McG. (Glasgow), J. W. (Frensham), F. G. I. (Bensham), T. P. (London, N.W.), J. T. (Midhurst), C. S. (Stratford), B. T. (Sheerness), C. H. L. (Edenbridge), L. H. (Nottingham), H. G. R. (Nottingham), J. H. (Brimscalf), J. H. I. (Camborne), J. G. C. (Maidstone), H. H. (Edgbaston), J. McG. (Partick), H. B. (Pudsey), A. R. (Scorrier), J. G. (Edinburgh), H. C. W. (Shipley), A. W. S. (Bristol), F. C. (Bournemouth).

NOTICE TO NEW READERS.

"Pipes and Pipe Joints" are treated upon in Nos. 20, 23, 24, 26, 28, 30, 33, 34, 36, 38, and 40.

A full set of London Priced Quantities is given in Nos. 10, 11, 12, 13, 14, 15, 16, 17, and 18.

"How to Take Off Quantities" appears in Nos. 51, 53, 61, 65, 67.

A series of solutions to questions set at recent examinations in Building Construction appears in Nos. 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 57, 60, 62, 64, 66, 69, 71 and, 73.

WORK, No. 419, March 27th, 1897, price 1d., The Illustrated Weekly Journal for Mechanics,—contains

HOW TO CORE HOLES IN CASTINGS.
SKINNING, PRESERVING, AND MOUNTING BIRDS.
HOW TO RE-LINE COLLARS AND SADDLES.
A WARDROBE MADE OF MATCHED BOARDING.
HOW TO MAKE A REVOLVING COAL VASE.
AMERICAN ORGAN CONSTRUCTION.
WORK WORLD NOTES. LETTERS TO THE EDITOR. QUESTIONS AND ANSWERS. ANSWERS TO CORRESPONDENTS.

CASSELL & CO., LIMITED, AND ALL BOOKSELLERS.

BUILDING TRADES EXHIBITION: SPECIAL DOUBLE NUMBER OF "BUILDING WORLD."

THE International Building Trades Exhibition at the Royal Agricultural Hall, Islington, N., which was opened by the Lord Mayor of London on Saturday, March 20, and will close on March 27, is described and illustrated in the 16-page Supplement issued with the present number of BUILDING WORLD, the whole forming a

Special Double Number.

As there is no extra charge for the Supplement, which, while affording a graphic account of the Exhibition, conveys a large amount of valuable practical information, this week's issue of BUILDING WORLD consists of

Thirty-two pages for One Penny.

During the Exhibition, our representatives will be glad to welcome BUILDING WORLD and WORK readers at the

"Building World" Stand,

which is seen immediately inside the Hall (eastern end), on approaching by the Arcade entrance in Upper Street, Islington. The nightly Craftsmanship Competitions in Masonry, Bricklaying, Carpentry, Joinery, Decoration, Plastering, Plumbing, and Lathing, should prove additionally interesting to BUILDING WORLD readers from the fact that a

"Building World" Medal

will be presented by the Editor to the most successful competitor in each division. The awards will be distributed on March 27 by Sir Arthur Arnold. A list of the competitors will be found on p. 1 of the Supplement.

BUILDING WORLD NOTES.

New retorts for the Llandudno gasworks are to be erected by Messrs. Drake & Son, of Halifax, at a cost of £3,313.

"Building World" competitive designs for houses that have cost about £150 to build are omitted this week, for want of space.

The Central London Railway, for which the underground boring is now in progress, is expected to cost about £500,000 a mile.

The winners of the £50 worth of prizes awarded to readers of BUILDING WORLD (see No. 75, p. 381) are informed that catalogues, from which they may select their prizes, are now being despatched to their addresses.

The Rustington Convalescent Home at Littlehampton, of which the memorial stone was laid on March 20 by the Bishop of Chichester, will be entirely for the use of working men, and is being built at a cost of £50,000, the gift of Mr. Harben, J.P., of Hampstead and Horsham. The same gentleman and his family have endowed the home with a further sum of £20,000.

A proposed college for Scarborough, to be built on a site belonging to the Corporation at the junction of Filey Road and Jackson's Lane, is estimated to cost more than £7,000. The plans selected are those sent in by Messrs. Hall, Cooper and Davis, of 24, Westborough, Scarborough, and the work, for which the contracts have not yet been arranged, is to be finished within the next twelve months.

"Architectural Photography" was the subject of a lecture delivered before the Exeter branch of the Devon and Exeter Architectural Society by Mr. Charles Cole, president of the Exeter Camera Club, who urged that photography gave the architect valuable facilities for the study of buildings, but that it should not supersede the sketch-block and pencil, as skill in sketching was a necessity for the architect; the camera, however, would assist the architect in training his faculty of artistic perception.

Lecturing on "The Architectural Outlook," on March 15, before the Architectural Section of the Glasgow Philosophical Society, Mr. David Barclay remarked that former ages had left a legacy of great works in architecture, which were possible under the conditions of civilisation then existing; but present conditions, while spreading general culture and comfort among the people, were not likely to demand, and therefore would not give opportunities for creating, buildings which would rival those of the past. Mr. Barclay thought that the abused system of architectural competition had reached the lowest possible level, and showed some signs of mending.

Concerning the Crystal Palace, of which the Lord Mayor, in opening the Building Trades Exhibition on March 20, said that it was perhaps a more remarkable structure than any invented by the mighty builders of the past—the Egyptians, Greeks, and Romans—and that it remains a monument to the imaginative genius of England, it may be interesting to recall that the famous glass structure was first erected in Hyde Park, opposite Prince's Gate, as the Great Exhibition building of 1851. It was re-erected, with a few modifications, on its present site at Sydenham in 1853-54, at a cost of £1,450,000. Sir Joseph Paxton, the author of the design, who was a landscape gardener, died in 1865.

The proposed new offices for the Commissioners of Sewers were commenced nearly three years ago upon a site near the Guildhall. The walls were raised well above the ground level, when an injunction was obtained respecting ancient lights enjoyed by the owners of premises opposite. After necessary alterations in the plans—providing for the setting back of the upper floors—the work was resumed; but difficulties with the builders have now arisen, in consequence of the advances in prices and in wages that have occurred during the suspension of the work, and the Commissioners have resolved to cancel the contract. Whether the building will ever be finished, or, at least, whether it will ever be applied to the purpose for which it was originally intended, is quite an open question, as a Bill is now before Parliament, providing for the transference to the City Corporation of the powers and duties of the Commissioners of Sewers; and if that Bill is passed, the building scheme will in all probability be abandoned.

ACCIDENTS.—On March 15, William Hector, apprentice mason, while helping to unload some blocks of stone from a lorry, in Forest Road, Aberdeen, had his left leg broken by one of the blocks, which was being slid down a plank that suddenly snapped.—Harry Bugg, 56, painter, while at work on a ladder in Bemerton Street, Caledonian Road, N., on March 1, overbalanced, and fell a distance of 10 ft., breaking a leg and eight ribs. Bronchitis and inflammation of the lungs set in, and he died on March 12 at the Royal Free Hospital. At the inquest held on March 16 the jury returned a verdict of "Accidental death."—A boy, named George Shipman, aged 15, was working on a building in Nottingham on March 17, when he stepped on a loose brick and fell to the ground, breaking his thigh.

BOOK NOTICE.

"Plastering, Plain and Decorative: A Practical Treatise on the Art and Craft of Plastering and Modelling with an Account of Historical Plastering in England, Scotland, and Ireland; accompanied by numerous examples." By William Millar, Plasterer and Modeller. With an Introductory Chapter by G. T. Robinson, F.S.A. London: B. T. Batsford, 94, High Holborn. 1897. Price 18s., net.

Art, as well as craftsmanship, enters so largely into the more delicate operations of plastering, that an adequate treatise on the subject could not fail to possess artistic and even literary interest, as well as practical utility; and Mr. Millar's volume, of which we have received an advance copy, appears to do justice to the subject from every point of view. The work consists of about 600 pages, which, 11 in. long by 8½ in. wide, are printed in clear type on stout paper; fifty-two full-page plates reproduce many notable examples of ancient and modern plasterwork as applied to external or internal decoration; and 231 smaller engravings (comprising more than 500 figures) illustrate chiefly and fully, but not exclusively, the tools, appliances, and methods employed in the art and craft, some examples of Mr. Millar's own work proving his possession of artistic taste as well as craftsmanlike skill. The book is the outcome of the many years of practical experience, close observation, and laborious note-taking of an exceptionally shrewd and intelligent craftsman; and his admirable digest of the mass of material so patiently accumulated forms a comprehensive treatise which probably will at once take rank as the standard work upon the subject. A summary of the history of plastering, by G. T. Robinson, F.S.A., forms an interesting introductory chapter. As indicated by the chapter-headings, the subjects dealt with in detail by Mr. Millar are—historical plastering, materials, lime plastering, decorative ceilings, running diminished and circular mouldings, exterior plastering, modelling, moulding and casting, model and running mould making, gelatine moulding, fibrous plaster work, reverse moulding, compositions, scagliola, foreign plaster work, terra-cotta, concrete, rudimentary geometry and architecture, tools and appliances; whilst useful memoranda for plasterers, a number of practical recipes, and a glossary of architectural and plastic terms are included in an appendix. We may possibly have a future opportunity of referring at greater length to this work, in which the industry of the author and the enterprise of the publisher are equally conspicuous.

LAW CASES.

Readers are invited to send us marked copies of reports of cases interesting to BUILDING WORLD *readers.*

Disputed Claim for Preparing Plans and Specifications.—At Bangor County Court, Robert Griffith, of Llanfairfechan, sued Henry Jorse, of the same town, for £3 12s. 6d., the cost of preparing plans and specifications for a house. For the defence, it was contended that plaintiff's plans and specifications were unsuitable, and that defendant was unable to make use of them. In cross-examination, defendant admitted having written to plaintiff's solicitor to the effect that plaintiff "had not had the manliness to call for his small account," adding, "Kindly inform him that it is here ready for him." The judge held that this was an admission of liability, and therefore gave judgment for plaintiff for £2 2s.

A Firm of Bricklayers and Dust Contractors Unsuccessfully Indicted for Nuisance.—In the Queen's Bench Division, on March 16, the Tottenham Urban District Council, sought to restrain Williamson & Sons, Ltd., from carrying on their business in the Green Lanes, Hornsey, as to create a public nuisance.—The defendants had carried on the business of brickmakers for many years at the place in question, and they were also dust contractors for a part of the parish of St. Pancras. The plaintiffs alleged that it was this latter part of the business that was so carried on as to be a nuisance. In particular, it was said that the burning of vegetable and animal matter, and the decomposition going on in such substances, the state of the ponds upon the defendant's premises, and other things, gave rise to offensive smells, and to the assembling of vast quantities of flies.—For the defence, it was contended that the defendants so conducted their business that there was no serious inconvenience to anybody, and that, in fact, the defendants had had no complaint whatever from anybody, except that from the local County Council. It was also said that since the defendants commenced business at the place in question a great number of houses had been built around their property, and, among other things, it was said that two or three years ago the Asylums Board put up one of their establishments close by the defendants' premises. It was suggested that these structures would hardly have been put up had it been thought that the defendants' works were a nuisance. As to one of the ponds specially complained of, it was said that a jack of 14 lb. weight had recently been caught in it, and the ponds were fast being filled up.—The jury stopped the case, and there was a verdict and judgment for the defendants.—Notice of appeal was given.

Bricklayer's Labourer Obtains Compensation for an Injured Knee.—At Yarmouth County Court, on March 11, Charles Edward Rayner, bricklayer's labourer, sued William Cork, builder and contractor, of Yarmouth, for £75 as compensation for injuries received.—For the plaintiff it was alleged that on May 20, 1896, a tank weighing two tons was being hauled into position when, owing to a plank breaking, the tank fell, injuring plaintiff's knee. Plaintiff was confined to his house for eight weeks, and defendant (his employer) had allowed him £1 a week for twenty-five weeks. Plaintiff was still unable to do anything beyond light work.—After the accident it was discovered that the plank which, by giving way, had caused the accident, had a knot in it.—For the defence it was contended that there was no evidence of negligence.—The jury awarded plaintiff £20 compensation; and as £25 had been paid into court, this verdict entitled the defendant to costs, which, however, he consented to forego.—The action was defended by the Employers' Liability Association.

The Cornish Viaduct Disaster: The Foreman and Ganger Charged with Manslaughter and Acquitted.—Before the Liskeard magistrates, on March 16, Foreman Blewett and Ganger Pearce were charged with the manslaughter of the twelve men killed by the collapse of the staging at Coldrenick viaduct, Menheniot, Cornwall, on February 9.—Counsel appearing on behalf of the Public Prosecutor contended that negligence was shown in selecting defective timber for staging on which men were working, and in omitting supporting chains.—For the defence, it was submitted that no evidence whatever had been adduced to inculpate the ganger Pearce, and that Blewett's only fault lay in neglecting to use the chains. Blewett, however, had never received any instructions to do so, and the previous practice had been not to use them.—The Bench, after five minutes' deliberation, dismissed the case.

Strange Charge of Theft of Timber: Case Dismissed.—At Blyth Petty Sessions, on March 8, Henry Richardson, farmer, Bedlington, was charged with stealing 360 ft. of flooring deals, and other timber, of the total value of £1 5s., the property of Thomas Weatheritt, builder, of Newcastle.—For the prosecution it was stated that between October and December last Weatheritt was carrying out a contract at Bedlington, and missed the above-mentioned timber. On January 12 a police-constable found a quantity of timber upon Richardson's premises, and noticed an outhouse that had been constructed of new wood. Richardson then admitted that the timber had belonged to Weatheritt, but explained that it had been given to him by Weatheritt's foreman, who, however, denied that he had given Richardson a single inch of timber.—Thomas Weatheritt admitted, under cross-examination, that timber had been laid in Richardson's fields to dry; and a foreman of Weatheritt's stated, under examination, that he (the foreman) had given Richardson leave to take a few deals, but had not stipulated the number, and had sold others without reporting the sales to his employer.—The chairman said that the Bench were not satisfied that any of the wood, which had been allowed to lie about in Richardson's fields, had been taken with felonious intent.—Case dismissed.

WORK AND WAGES.

Items of Interest to BUILDING WORLD *readers are inserted under the above heading. Early information of all intended Meetings, Reports, and other Items is invited.*

ABERDEEN.—At the annual social meeting of the Aberdeen Branch of the Scottish National Federation of House and Ship Painters, the chair was occupied by Mr. Adam Buchan, President of the Masters' Association, who testified to the cordial relations existing between the masters and men, and congratulated the men upon the strength and successful working of their union.

AUSTRALIA.—A strike has occurred at Perth, West Australia, where about 300 men are out; and at Kalgoorlie the carpenters and joiners and masons had, when the mail left, decided to strike unless the masters conceded their demand for an increase from 11s. a day to 12s.

BELFAST.—At a meeting of the Belfast Plasterers' Society, held on March 15, it was decided to grant donations of £10 each to the new Queen Victoria Hospital and to the Mater Infirmorum.

BIRMINGHAM.—Colonel John Ord Hasted, Inspector to the Local Government Board, held an inquiry at the Council House, on March 17, with respect to the application of the Birmingham City Council for leave to borrow £25,586 for purposes connected with their markets and slaughter-houses; £15,500 for the Digbeth improvements; £1,600 for the erection of a police-station at Harborne; and £2,500 for the extension of the chief fire-station in the Upper Priory.

COVENTRY.—The dispute here, which affected at least 5,000 men, has been settled by compromise, the masters granting an increase of ½d. an hour to skilled operatives, while the men have made certain concessions with regard to the bye-laws that had been put forward.

DONCASTER.—The carpenters and joiners have decided to apply for an increase of ½d. an hour in wages, and for certain alterations in the bye-laws.

DUNDEE.—At a meeting of the Dundee Trades Council, held on March 10, it was announced that the master plumbers had agreed to sign new bye-laws, and to grant the operatives an advance of ½d. an hour, as from June 21. It was stated that this was the first occasion upon which a general dispute in the plumbing trade in Aberdeen had been settled without a strike; the present agreement having been arrived at by reference to the Arbitration Board.

FORFAR.—The operative plumbers have issued a notice to the employers demanding an advance of wages from 6½d. an hour to 7d., with revised bye-laws, the notice to expire on the first Monday in August.

PENRHYN QUARRIES.—On March 18 a conference was held at the Port Penrhyn offices between Lord Penrhyn and the deputation recently appointed to confer with him on the question of bringing to an early termination the lock-out which has now lasted for six months. There were present Lord Penrhyn, Mr. Douglas Pennant, M.P., and Mr. Young, chief manager of the quarries, representing the employer's interest; and, representing the men, Mr. Robert Davies, chairman of the deputation which acted before the lock-out, Mr. W. H. Williams, known as "the quarrymen's Gladstone," and Mr. Henry Jones, another member of the original deputation. The sitting, which lasted for several hours, was held with closed doors, no representatives of the press being admitted. When the meeting was concluded, all the members and officials on each side were pledged to secrecy as to the actual results of the conference. It was believed, however, that the initial difficulty which the conference had to face, that of the right of the men to combine for trade purposes, had been successfully overcome. This rumour, however, turned out to be erroneous.—An open-air meeting of the men was held at Bethesda on Saturday, March 20, under the presidency of Mr. W. R. Evans, chairman of the quarry committee, when the following resolution, which is in identical terms with that passed at the commencement of the strike, on September 30th, 1896, was read by the chairman, and it was moved and seconded from the audience, and enthusiastically agreed, that the same resolution should be issued as the declaration of the meeting:—"That we, the general body of men employed at the Caebraycafn Quarry, consider that we are to-day out of employment on the all-important question of the right of working men to combine together, and to act by committee and deputation for the purpose of securing our fair and reasonable rights, and we trust the whole body of working men throughout the kingdom will extend us their support in this conflict." Mr. W. H. Williams, the leader of the deputation to Lord Penrhyn, who was received with immense cheering, said the kernel of the negotiations on the preceding Thursday was the difference between the two words "permit" and "recognise." On everything else the parties were practically agreed; but while Lord Penrhyn said "permit," the men said "recognise," and on that rock they had split. A committee which would not be recognised would not be worth having. He urged the men to stick to their principles without losing control of their temper. Let those who had yet stayed at home set out on Monday morning and seek work elsewhere, accepting what was offered them if they could not get exactly what they wanted. In conclusion, he could only tell them that they had left open the door of communication between themselves and Lord Penrhyn, and he had not yet given up all hope of securing an honourable settlement.—At Carnarvon a special meeting of the Executive Council of the North Wales Quarrymen's Union was held on March 20, under the presidency of Mr. W. Thomas, Chairman of the Union. There was a full attendance of delegates. The case of the Penrhyn Quarry dispute occupied the attention of the Council, and the following resolution was unanimously adopted:—"That this Executive Council of the North Wales Quarrymen's Union, having read the full account of the Conference between Lord Penrhyn and the representatives of his late employees, consider that the struggle in which our fellow-workmen at Bethesda are engaged is in defence of the fundamental principles of Trade Unionism. The Executive, therefore, call upon all the Lodges of this Union to continue to extend to the Penrhyn quarrymen their hearty and practical support."—The Friendly Society of Ironfounders have contributed £300 to the quarrymen's fund.

PERTH.—The Perth Master Painters' Association, at a meeting held in the Grand Hotel on March 13, unanimously agreed to grant the advance in wages for which the men had applied—namely, ½d. an hour, from 7d. to 7½d. The increase, however, is not to take effect until May 1, in order that existing contracts based upon the old rates may be completed without loss to the employers.

SCARBOROUGH.—A commencement has now been made upon the work of constructing the new marine drive, which is to cost £70,000. Messrs. B. Cooke & Co., of Battersea, the contractors for the work, hope to have everything ready for the laying of a memorial stone on the day upon which the Queen's Diamond Jubilee is to be celebrated (June 22).

SULLY, NEAR BARRY.—It is understood that the Wimborne estate, comprising about 1,200 acres, and situated between the new docks at Barry and Sully Island, is about to be laid out for building purposes, under the management of Mr. H. Kay, of the Wimborne Estate Office, Pontyclun; and that Messrs. Veall & Sant, of Cardiff, have been appointed architects to the estate. Superior houses are to be erected, a large residential hotel is to be built on a site near Sully Station, and it is anticipated that the little village will gradually develop into a high-class seaside resort.

New works that will shortly be taken in hand, are:—ADDIEWELL, construction of a reservoir.—ABERDEEN, additions at No. 33, Alleyn Place; erection of two dwelling-houses on the south side of Hamilton Place; erection of dwelling-houses on the west side of Balmoral Place; erection of four dwelling-houses on the west side of Marquis Road; rebuilding of business premises on the west side of King Street; erection of a stable at No. 23, Short Loanings; erection of dwelling-house on the north side of Rubislaw Den South; erection of four dwelling-houses on the west side of Walker Road, Torry; erection of dwelling-house on the east side of Great Northern Road; erection of dwelling-house and shop on the west side of Skene Square; erection of four dwelling-houses on the west side of Forest Avenue; erection of church on the north side of Victoria Road, Torry.—BALLYMENA, alterations to fever hospital.—BRIGHTON, enlargement of the workhouse.—CHESTER, erection of baths in Union Street.—COATES, water-supply works.—EDINBURGH, erection of a hall.—FARNBOROUGH, erection of memorial hall.—FLEETWOOD, private street works.—HALIFAX, sewerage works; water-supply works.—HORNCASTLE, sewerage works.—HUDDERSFIELD, street works.—HULL, extension of the workhouse.—LINCOLN, wood-paving works.—LISKEARD, erection of infirmary.—LITTLE HOUGHTON, sewerage works.—MALVERN, sewerage works.—NORWICH, repair of Wroxham Bridge.—NUNEATON, construction of streets and sewers.—PENISTONE, sewerage works.—PLYMPTON ST. MARY, drainage works.—POTTER'S BAR, erection of an isolation hospital.—POULTON, sewerage works.—RIPON, erection of market hall.—SHARDLOW, drainage works.—SHELDON, street improvements.—SOUTHGATE, erection of mortuary.—SOUTHWICK, street works.—STANHOPE, erection of town hall.—URMSTON, private street works; drainage works.—WAKEFIELD, erection of a laundry.

In replying to advertisements appearing in BUILDING WORLD, readers will oblige by mentioning the name of this journal.

COMING EVENTS.

Sat. Mar. 27.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Inspection and Demonstration at Harrison and Barber's Knacker Yard, Whitechapel. 3 p.m.—INTERNATIONAL BUILDING TRADES EXHIBITION, Royal Agricultural Hall, Islington, N. Closing day. Distribution of prizes by Sir Arthur Arnold.

Mon., Mar. 29.—ROYAL INSTITUTE OF BRITISH ARCHITECTS, 9, Conduit Street, W.—General Meeting (ordinary). Paper and Discussion, under management of Science Standing Committee.—LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY, Mechanics' Institute, Leeds.—Presentation of the annual report. 7.30 p.m. SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—J. Priestley, M.D., etc., Medical Officer of Health, Lambeth, on "Ventilation, Warming, and Lighting." 8 p.m.

Tues., Mar. 30.—SOCIETY OF ARTS, John Street, Adelphi.—W. R. Lethaby, on "Lead Work." 4.30 or 8 p.m.

Wed., Mar. 31.—SANITARY INSTITUTE, Parkes Museum, Margaret Street W.—Inspection and Demonstration in the Parish of St. George's Hanover Square, conducted by A. Taylor, Chief Sanitary Inspector 2 p.m. Number limited.

Thurs., Apr. 1.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—J. W. Peggs, A.M.I.C.E., on "Principles of Calculating Areas, Cubic Space, etc.: Interpretation of Plans and Sections to Scale.

Fri., Apr. 2.—ARCHITECTURAL ASSOCIATION, 9, Conduit Street, W.—T. G. Jackson, R.A., on "Architecture in Relation to the Crafts." 7.30 p.m.

Sat. Apr. 3.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Inspection and Demonstration at Aylesbury Dairy Company's premises, Bayswater. 3 p.m. Number limited.

Mon. Apr. 5.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Professor T. R. Smith, F.R.I.B.A., District Surveyor, West Wandsworth, on "Sanitary Building Construction." 8 p.m.

Wed. Apr. 7.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Inspection and Demonstration at the Disinfecting Station, Chelsea, conducted by Louis Parkes, M.D., 3 p.m.—Inspection of the West London Paper Mill Company's Works, Fallopian Wharf, Lott's Road, Chelsea. 4 p.m.

Thurs., Apr. 8.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Fri., Apr. 9, *and Sat., Apr.* 10.—SANITARY INSTITUTE, Margaret Street, W.—Examinations in Practical Sanitary Science, and for Inspectors of Nuisances at Birmingham.

Sat., Apr. 10.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Inspection and Demonstration at the Sewage and Destructor Works, Ealing, conducted by C. Jones, M.I.C.E., Engineer and Surveyor, Ealing Urban District Council. 2.30 p.m.

Mon., Apr. 12.—SANITARY INSTITUTE, Parkes Museum, Margaret Street W.—G. Reid, M.D., etc., Medical Officer of Health, Staffordshire County Council, on "Sanitary Appliances." 8 p.m.

Tues., Apr. 13.—SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS, 17, George Street, Sheffield.—Annual General Meeting. 7 p.m.

Wed., Apr. 14.—SANITARY INSTITUTE, Parkes Museum, Margaret Street, W.—Inspection and Demonstration of Artisans' Dwellings, Boundary Street Area, Bethnal Green, conducted by O. Fleming, Architects' Department, London County Council. 3 p.m.

MARKET PRICES.

METALS.

		£ s. d.	£ s. d.
Iron—Pig, Scotch war.	ton	2 5 3	2 5 7
Middlesbrough	"	2 0 7½	2 0 10½
Hematite	"	2 8 3	2 9 7½
Copper—Chili bars	"	49 13 9	50 8 9
Tough	"	52 10 0	52 15 0
Strong sheets	"	61 0 0	—
Lead—English Sheet	"	12 5 0	—
Tin, Straits	"	60 1 3	61 3 9
Australian	"	61 12 6	62 2 6
Zinc—English sheet	"	—	—
Vieille Montagne	"	20 10 0	—
Silesian, f.o.b. Stettin	"	20 0 0	—
Tinmen's strip solder	cwt.	3 17 0	—

TIMBER.

		£ s. d.	£ s. d.
Ash, Canada	load	3 0 0	4 5 0
Battens, all kinds	std.	5 0 0	12 10 0
Birch, Canada	load	3 15 0	4 10 0
Box, Turkey	ton	4 0 0	15 0 0
Cedar, Cuba	ft. sup. as 1 in.	0 0 4½	0 0 5
" Honduras	"	0 0 4	0 0 5
Deals—Finland 2nd & 1st	std.	7 0 0	8 10 0
" 4th & 3rd	"	7 0 0	8 0 0
" " Riga	"	7 0 0	8 0 0
St. Petrsbrg., 1st yellow	"	9 10 0	12 0 0
" 2nd "	"	7 10 0	9 0 0
" white	"	8 0 0	9 10 0
Deals—Swedish	"	7 0 0	15 10 0
White Sea	"	7 5 0	14 0 0
Canada Pine, 1st	"	21 0 0	24 0 0
" " 2nd	"	16 0 0	17 0 0
" " 3rd, &c.	"	9 0 0	10 0 0
" Spruce, 1st	"	9 0 0	10 10 0
" " 3rd & 2nd	"	6 10 0	7 10 0
New Brunswick	"	6 0 0	7 0 0
Elm, Canada	load	3 15 0	5 0 0
Fir, Dantzig, &c.	"	2 5 0	3 0 0
Kauri pine	ft. cube in log	0 2 0	0 2 6
"	" " plank	0 2 3	0 2 9
Jarrah	" " "	0 2 6	0 2 9
Flooring boards, 1st	sq.	0 9 6	0 14 6
" " 2nd	"	0 6 6	0 11 6
" " Other qual.	"	0 4 6	0 7 6
Greenheart, B. G.	ton	8 0 0	—
Lath, Dantzig	fath.	4 10 0	5 10 0
" St. Petersburg	"	5 0 0	6 10 0
Mahogany, Cuba	ft. sup. as 1 in.	0 0 3	0 0 6
St. Domingo, cargo arr.	"	0 0 4	0 0 6
Mexican	"	0 0 4	0 0 5
Tabasco	"	0 0 5	0 0 7
Honduras	"	0 0 5	0 0 6½
Oak, Dantzig	load	2 15 0	4 15 0
" Canada	"	6 5 0	7 15 0
Odessa, crown	"	2 15 0	5 0 0
Pine, Canada, red	load	—	—
" yellow	"	2 10 0	4 15 0
Rose, Bahia	ton	8 0 0	15 0 0
" Rio	"	7 0 0	16 0 0
Satin, St. Domingo	ft. sup. as 1 in.	0 0 7	0 1 0
" Porto Rico	" "	0 0 7	0 1 6
Sequoia (Californian Redwood)	" "	0 1 7	0 1 10
Teak, E.I.	load	11 0 0	16 0 0
Wainscot, Riga, &c.	log	2 15 0	5 0 0
Walnut, Italian	ft. sup. as 1 in.	0 0 3	0 0 7

OILS, ETC.

		£ s. d.	£ s. d.
Linseed	per cwt. in pipe	0 14 0	—
"	" " " brls.	0 14 6	0 15 7½
White lead	cwt.	0 18 0	1 2 0
" " Jointing	"	0 14 6	—
Red lead	"	0 13 10½	—
Driers (patent)	gal.	0 6 0	—
Terebene	"	0 7 0	—
Varnishes—Oil	"	0 5 6	1 0 0
" Spirit	"	—	—
" Knotting	"	0 7 0	—
Ochre, raw	cwt.	0 5 0	0 7 0
" In oil	"	1 0 0	1 4 0
Umber, raw	"	0 6 9	0 8 0
" In oil	"	1 2 0	1 6 0
Sienna, raw	"	2 0 0	—
" In oil	"	1 10 0	1 16 0
" Burnt	"	2 5 0	—
Red, Venetian	"	0 7 0	0 8 0
Ultramarine	lb.	0 0 5	0 0 8
Drop black	"	0 0 6	0 0 9
Vegetable black	"	0 0 6	0 0 9
Tar, Stockholm	brl.	1 15 0	—
" Archangel	"	0 14 6	—
Turpentine, American	"	1 0 9	1 0 10½
Pitch, Archangel	cwt.	0 10 9	—
Glue	lb.	0 0 3	0 1 0
Roofing Felt	yd.	0 0 5	—

CONTRACTS OPEN.

Information to be inserted under either of these headings should be vouched for by the Architect or Surveyor of the Work.

BUILDING.

Alford.—March 27. Works at the epidemic hospital, for the District Committee. Particulars of J. Duncan & Son, architects, Turriff.
Atherton.—March 27. Erection of a cotton-spinning mill, for the Howe Bridge Cotton Spinning Co. Particulars of Bradshaw & Goss, architects and surveyors, 19, Silverwell Street, Bolton.
Auchnagott.—March 29. Alterations to the parish church, Savoch. Particulars of W. Clark, architect, Methlick, N.B.
Brandon.—Alterations and additions to the High Street Board schools, for the School Board. Particulars of F. G. Wood, clerk to the Board, High Street.
Cardiff.—March 29. Extensions to the House of Nazareth, including the erection of a new chapel. Particulars of E. W. M. Corbett, architect, Bute Estate Office.
Catford.—Erection of eight terrace houses on land situate on the west side of Beechfield Road. Particulars of Philipps & Norfolk, architects, Catford Bridge, S.E.
Chapwell.—March 27. Erection of caretaker's house at the High Spen schools, for the School Board. Particulars of J. Oswald, architect, 33, Mosley Street, Newcastle-on-Tyne.
Chatham.—April 26. Erection of Town Hall and Municipal Offices, for the Corporation. Particulars of G. E. Bond, architect, High Street, Rochester.
Clacton-on-Sea.—Erection of three houses in Carnarvon Road. Particulars of T. H. Baker, architect, Town Hall.
Cockfield.—March 27. Additions to the infants' school. Particulars of Mr. Weldop, National School.
Cork.—April 3. Erection of new shop-front and sundry alterations to No. 6, Patrick Street, for W. Clarke & Son. Particulars of R. Walker, architect, 17, South Mall.
Crawley.—March 27. Erection of a house and shop, and other works. Particulars of W. Buck, architect, 6, West Street, Horsham.
Devizes.—March 30. Altering cottages to almshouses, for the Municipal Charity Trustees. Particulars of J. A. Randall, Exchange Place.
Fleet.—March 27. Restoration of the roof of the nave and the north and south aisle roofs of a church. Particulars of W. M. Fawcett, 1, Silver Street, Cambridge.
Hampton Wick.—March 27. Repairs to Lansdown House, Lower Teddington Road, for the U.D.C. Particulars of J. N. Horsfield, surveyor, District Council offices.
Haverfordwest.—March 31. Erection of a class-room, etc., at the National schools. Particulars of A. A. Thomas, architect.
Irthlingborough.—Erection of a villa residence, for J. Stott and. Particulars of H. Adnitt, architect, High Street, Rushden.
Kingston-upon-Hull.—March 31. Erection of a new junior department, for the School Board. Particulars of W. Batterill, surveyor, 23, Parliament Street.
Knowlton Court, Kent.—March 27. Rebuilding the hop oast, and works in connection therewith, at the Home Farm. Particulars of W. J. Jennings, architect, St. Margaret's Street, Canterbury.
Leeds.—March 31. Alterations to the Queen Hotel, Roundhay Road, for G. Wood. Particulars of T. Winn, architect, 90, Albion Street.
Liskeard.—April 3. Erection of a police station, constables' house, and appurtenances, for the Cornwall County Council. Particulars of H. J. Snell, architect, 13, Courtenay Street, Plymouth.
London, S.E.—March 31. Execution of works required in underpinning the isolation ward, South Eastern Fever Hospital, Hatfield Street, Old Kent Road, for the Metropolitan Asylums Board. Particulars of T. D. Mann, Norfolk House, Norfolk Street, Strand, W.C. **N.E.**—March 31. Repairing chimney stacks and ventilating flues of the old pavilion at the infirmary at Homerton, for the Hackney Board of Guardians. Particulars of F. R. Coles, clerk, Union Workhouse, Homerton. **W.**—April 1. Erection of a greenhouse for the Paddington Burial Board. Particulars of H. Cecil, clerk to Burial Board, Vestry Hall, Harrow Road, W.
Middlesbrough.—March 31. Erection of six houses in Newport Road and eighteen houses in Victoria Street. Particulars of R. Lofthouse & Sons, architects, 62, Albert Road.
Monmouth.—April 12. Erection of engine house, boiler house, boiler seatings, flues, chimney shaft, and concrete races, for the turbines at the generating station; also collecting tanks and pump chamber at the sewage pumping station for the Town Council. Particulars of Bramwell & Harris, engineers, 5, Great George Street, Westminster, London, S.W.
Newcastle.—March 31. Execution of masonry and other work in connection with the widening of Whitfield Bridge, for the Northumberland County Council. Particulars of the county surveyor, Moat Hall.
Newtown.—March 31. Erection of a school, for the Newtown County Intermediate Governors. Particulars of H. Teather, architect, Andrew's Buildings, Queen Street, Cardiff.
Paisley.—March 27. Erection of a new volunteer drill hall, in High Street. Particulars of T. G. Abercrombie, 13, Gilmour Street.
Parsonstown.—March 27. Erection of a residence for the medical officer at Kinnetty, for the Board of Guardians. Particulars at the Union workhouse.
Pontypridd.—April 3. Erection of a school in the Llan Wood, for the School Board. Particulars of A. O. Evans, Post Office Chambers.
Salford.—March 31. Erection of a shed and boundary wall behind the Broughton baths, for the Corporation. Particulars of the engineer, Town Hall.
Sandbach.—April 2. Erection of a branch shop at the Hill, for the Sandbach Industrial Co-operative Society. Particulars obtainable at the central office Bold Street.
Selby.—March 31. Erection of engine shed, coaling stage, etc., for the North Eastern Railway Co. Particulars of W. Bell, Company's architect, York.
Sheffield.—March 27. Erection of a drapery establishment, covering about three-quarters of an acre, for J. Walsh. Particulars of Flockton, Gibbs & Flockton, architects, 15, St. James' Row.—March 31. Construction of public baths in Sutherland Road, for the Corporation. Particulars of C. F. Wike, city surveyor, Town Hall.—April 3. Construction of a roof (350 ft. long by 70 ft. span), and fixing slate laths and cast-iron guttering at the retort house at Grimesthorpe works, for the Gas Light Co. Particulars of F. W. Stevenson, engineer, company's offices, Commercial Street.
Southam.—April 3. Enlarging and rebuilding schoolroom, and renovation of Congregational church, inside and outside. Particulars of A. J. Sinnett, London House.
South Moor.—April 3. Erection of twelve cottages in John Street. Particulars of J. Errington, Ox Inn, Oxhill, Durham.
Stoke Gabriel.—Erection of a house and stables. Particulars of W. T. Allen, architect, Kingswear.
Stranraer.—March 29. Erection of the Garrick Hospital. Particulars of R. Park, architect, Newton Stewart.
Strathdearn.—April 7. Erection of a shooting lodge and offices at Coignafearn Deer Forest. Particulars of W. L. Carruthers, architect, 42, Union Street, Inverness.
Uppermill.—March 27. Masonry works required in rebuilding the bridge over the river Tame, for the West Riding County Council. Particulars of — Rowbotham, clerk to the U.D.C.
Walton-le-Dale.—March 30. Erection of six houses in School Lane. Particulars of F. E. Dixon, architects, Bank Chambers, Preston.
West Ham.—April 13. Erection of sewage pumping engine, boiler houses, and electric light building at the Abbey Wharf, Stratford, for the Corporation. Particulars of L. Angell, engineer, Town Hall, Stratford.
West Hartlepool.—April 2. Erection of a post office, for H.M. Commissioners of Public Works. Particulars of R. B. Brett, secretary, H.M. Office of Works, 12, Whitehall Place, London, S.W.

ENGINEERING.

Aberdare.—March 31. Supply of sundry cast-iron and steel work, including a light lattice girder footbridge of three spans, 57 ft. 6 in. each, to be erected at the reservoir at Nant-Melyn Valley, for the U.D.C. Particulars of W. Fox, 5, Victoria Street, London, S.W.
Antwerp.—April 26. Construction of a quay and various works in connection with the Scheldt, for the Provincial Government. Particulars of the Musée Commerciale, 17, Rue des Augustins, Brussels.
Hythe.—April 3. Erection of a steel footbridge over the Royal Military Canal, for the Town Council. Particulars of E. Hulme, engineer, 47, Victoria Street, Westminster, London, S.W.
India.—April 6. Supply of locomotive boilers, etc., for the Secretary of State for India. Particulars of E. G. Burls, Director-General of Stores, India Office, Whitehall, London, S.W.
Leeds.—March 23. Supply, delivery, and erection of steam, water, and exhaust pipes, valves, etc., for the Town Council. Particulars of Dr. J. Hopkinson, 5, Victoria Street, Westminster, London, S.W.
Leigh, Lancs.—April 7. Supply and erection of a boiler, engine, and laundry plant at the Astley sanatorium, for the Joint Hospital Board. Particulars of Banks, Fairclough & Stephen, architects.
Ostend.—April 17. Execution of the new harbour works, for the Provincial Government. Copy of despatch may be seen at the Commercial Department, Foreign Office, London, S.W., between 11 a.m. and 6 p.m. daily.
Pembroke Dock.—Supply of a steam boiler. Particulars of the Gas Manager, King William Street.
Romford.—April 17. Supply of 20-horse-power steam engine, with belting, tank, pump, and girders, for the U.D.C. Particulars of E. Winmill, engineer, Britton's Farm, Hornchurch.
West Cheshire.—April 7. Work of sinking a bore hole, 15 in. to 12 in. diameter and 450 ft. deep, for the West Cheshire Water Company. Particulars of G. Millar, secretary, 9, Hamilton Square, Birkenhead.

IRONWORK, ETC.

Aldershot.—Supply of about three miles of 10-in. spigot and socket cast-iron pipes, usual stock size and weights, for the Aldershot Gas and Water Co. Particulars of the Secretary, Gas and Water Co., 103, Victoria Road.
Belper.—March 31. Erection of iron roofs, columns, gutters, etc. (about 310 tons), connected with the new moulding and fitting shops, Derby Road, for the Park Foundry Co. Particulars of M. Hunter, engineer, Bridge Street.
Cork.—March 29. Supply and delivery at Albert Quay of about 300 tons of cast-iron pipes, and special castings, from 3 in. to 8 in. in diameter, for the Corporation. Particulars of H. A. Cutler, city engineer, Municipal Buildings.
Dundee.—April 3. Supply of a quantity of cast-iron pipes, for the Dundee Gas Commissioners. Particulars of the engineer, gasworks.
London, N.E.—April 1. Supply of 100 lamp columns, and 160 gully gratings, for the Bethnal Green Vestry. Particulars of F. W. Barratt, surveyor, Vestry Hall, Church Row, Bethnal Green.
Margate.—April 3. Supply of wrought iron unclimbable hurdles (about 1,400 lineal yd.), for park fencing, for the Corporation. Particulars of A. Latham, borough engineer, 15, Cecil Square.

LIGHTING.

Lockerbie.—March 29. Supply of fire-clay retorts, bricks and fireclay, to be delivered, carriage paid, at Lockerbie Station, for the Gas Commissioners. Particulars of D. McJerrow, town clerk.—March 29. Supply of a gas exhauster (new or second-hand) to pass 3,000 cub. ft. per hour, complete with disc valves, automatic by-pass valve regulator and throttle valve, and connection for a 5 in. main, also three 5-in. valves, and one pump for ammoniacal liquor, for the Gas Commissioners. Particulars of D. McJerrow, town clerk.
Longford.—Supply of five oval clay retorts, 8 ft. 6 in. by 21 in. by 15 in., delivered at the station, for the Gas Company. Particulars of W. A. Reid, secretary to the Company.
Saint Paul, Brazil.—April 30. Construction of gasworks and working same for forty years. Particulars at the Brazilian Consulate and Embassy, London.
Warrington.—Supply of the following for the Corporation:—Wrought-iron hydraulic and foul mains, ascension and top pipes, seal regulating valves, cast-iron main pipes, exhausters, and self-sealing mouthpieces. Particulars of F. Taylor, secretary, Gasworks.
Wells.—March 27. Construction and equipment of an electric light station, supply of underground cables, etc., for the Town Council. Particulars of R. L. Foster, town clerk.

PAINTING.

Bradford.—Painting the whole of the outside wood and ironwork of the Mechanics' Institute. Particulars of J. Reddie, secretary, Mechanics' Institute.
Hull.—Painting twenty-one houses in Fielding Street, Holderness Road. Particulars of — Hausine, 37, Hedon Road.
London, S.W.—April 1. External and internal painting and other general repairs to the Tate Central Library, Brixton Oval, for the Lambeth Library Commissioners. Particulars of H. J. Smith, Vestry Hall, Lambeth.
Lutterworth.—April 8. Inside painting and repairs at the workhouse, for the Board of Guardians. Particulars of T. C. Bodycote, clerk.

ROADS.

Ashby-de-la-Zouch.—April 2. Work of establishing a main-drainage system in the parish of Bardon, for the R.D.C. Particulars of J. B. Everard, 6, Millstone Lane, Leicester.
Axminster.—March 31. Supply of materials and the ordinary repairs for two years from April 1 of the district roads or highways and footpaths in the northern division of Chardstock, and the main roads in Chardstock and Hawkchurch, for one year from April 1, for the R.D.C. Particulars of J. G. Pinney, district surveyor.
Aylesbury.—March 27. Supply of about 15,000 tons of granite for ensuing six months at various stations and wharves, for the Bucks County Council. Particulars of R. J. Thomas, surveyor, County Hall.
Batley.—April 5. Levelling, paving, flagging, channelling, and completing St. James Street, for the Corporation. Particulars of O. J. Kirby, borough surveyor, Market Place.
Beckenham.—March 29. Supply of 850 cub. yd. of 1½-in. broken Guernsey granite and 350 cub. yd. of 1½-in. Cherbourg quartzite, for the U.D.C. Particulars of J. A. Angell, engineer to the Council.
Blaydon-on-Tyne.—March 31. Paving and flagging back James Street East, for the U.D.C. Particulars of the Council surveyor.
Branston.—March 31. Supply of 6,040 tons of broken granite—viz. 4,520 X and 1,520 XX at per ton; also 4,350 tons of slag broken to 2 in. at per ton, for the R.D.C. Particulars of W. B. Danby, clerk, 2, Bank Street, Lincoln.
Bristol.—March 31. Relaying footpath in Church Road, for the St. George U.D.C. Particulars of T. L. Lewis, surveyor, Parochial Offices, St. George.
Gloucester.—March 27. Laying about 3,510 yd. of 15-in., 12-in., and 9-in. pipe sewers, with manholes, flushing tanks, etc., in the parishes of Wotton, St. Mary Without, Barnwood, and Hucclecote, for the R.D.C. Particulars of J. F. Trew, C.E., County Chambers.
Hartlepool.—April 8. Supply of materials for roads in the district, for the R.D.C. Particulars of W. Burton, road surveyor, Billingham.
Inverness.—March 31. Construction of underground conveniences in Academy Street, for the Corporation. Particulars of the borough surveyor.
Kingston-on-Thames.—March 31. Levelling, making, kerbing, channelling, paving, and lighting Gloucester Road and Young's Buildings, for the Corporation. Particulars of the borough surveyor, Clattern House, Kingston.
Lancaster.—April 2. Supply of limestone (about 7,000 tons), whinstone (1,200 tons), slag (500 tons), for the R.D.C. Particulars of W. Cumming, surveyor.
London, N.—March 29. Work of sewering, levelling, paving, metalling, channelling, and making good portions of Hillfield Avenue and Queensmore Road, Weston Park, for the Hornsey U.D.C. Particulars of E. J. Lovegrove, C.E., engineer, Council Offices, Southwood Lane, Highgate, N. **S.W.**—March 31. Supply of road and path materials at Victoria Park, Hackney, for the London County Council. Particulars at the Parks Department, Spring Gardens, S.W. **N.**—March 29. Sewering, levelling, paving, metalling, channelling, and making good Hatherley Gardens, for the Hornsey U.D.C. Particulars of E. J. Lovegrove, C.E., engineer, Council offices, Southwood Lane, Highgate, N.
Long Eaton.—Sewering, metalling, and making two streets, for E. T. Hooley and J. L. Attenborough. Particulars of E. R. Ridgway, M.S.I., architect.
Macclesfield.—March 29. Supply of road stone, slag, edging stones, glazed socketed pipes, drain pipes, gravel, and setts, for the R.D.C. Particulars of the assistant clerk, Union Offices.
Maldon.—April 3. Supply and delivery of granite, gravel, flints, and picked stones, for year ending March 31, 1898, for the R.D.C. Particulars of A. Sims, surveyor, Southminster.
Manchester.—Supply of 500 tons dressed grit crossing setts, for the Corporation. Particulars of the chief clerk, Highways Office, Town Hall.
Middleton.—March 31. Supply, during year ending March, 1898, of 700 tons of setts, 760 yd. of flags, sanitary tubes, 300 yd. of kerbs, 1,600 tons of macadam, and cast-iron manhole and street grids, for the Corporation. Particulars of W. Welburn, borough surveyor.
Oystermouth.—April 1. Supply of broken stone and haulage of road scrapings for one year from March 31, for the U.D.C. Particulars of C. Bennett, surveyor, Board Room, Mumbles.
Pontefract.—April 1. Supply of material for the repair of the highways for one year from April 1, for the R.D.C. Particulars of J. D. Smith, assistant clerk, Union Offices.
Prestwich.—April 6. Forming, ballasting, paving (with tar macadam), kerbing, channelling, and flagging Bailey Street, Heaton Park, from Newton Street to Kenyon Street, for the U.D.C. Particulars of T. Nuttall, surveyor, 20, Market Street, Bury.
Rochester.—March 27. Construction of a new road, with cross roads and drainage works, in continuation of Dale Street, Ordnance Place, Chatham, for the trustees of Watts' Charity. Particulars of J. W. Nash, surveyor, High Street.
St. Neots.—April 6. Supply of 2,000 tons of granite, 500 tons of slag, and 2,000 yards of gravel, for the R.D.C. Particulars of J. Ennals, clerk, Eaton Socon, near St. Neots.
Selby.—March 29. Supply of whinstone, granite, drains, etc., for the year ending March, 1898, for the R.D.C. Particulars of E. Townend, clerk, Council Offices, New Lane.
Shardlow.—April 6. Supply of broken granite, gravel, limestone, and slag for the highways in the district for year ending March 25, 1898, for the District Council. Particulars of W. G. Briggs, surveyor, Alvaston.
Sibsey.—March 29. Supply of 1,400 tons to 1,700 tons of broken X and X X granite at per ton, and 1,000 tons to 1,400 tons of X and X X slag, for the R.D.C. Particulars of J. M. Simpson, clerk to the Council, Boston.
Southampton.—April 13. Construction of brick and concrete egg-shaped sewers, 4 ft. 6 in. by 3 ft., 4 ft. by 2 ft. 8 in., and 3 ft. 6 in. by 2 ft. 4 in., stoneware pipe sewers, 9 in., 12 in., 15 in., 18 in., and 24 in., cast-iron pipe sewers, and ejector chambers, for the Corporation. Particulars of W. B. Bennett, borough engineer, Municipal offices.
Stonehaven.—March 27. Paving, macadamising, and channelling New Street, for the Burgh Commissioners. Particulars of the surveyor.
Sunbury-on-Thames.—April 1. Construction of buildings precipitation tanks, laying of carriers for irrigation land, fencing, etc., for the U.D.C. Particulars of J. Ainsree, engineer, 17, Victoria Street, Westminster, S.W.
Thame.—March 30. Supply of 860 tons best selected hand-broken Hartshill granite, broken to 2-in. cube gauge, for the R.D.C. Particulars of J. Gooderough, district surveyor, Thame.
Truro.—March 27. Supply of the following materials for 12 months from April 15, for the U.D.C. Glazed stoneware drain pipes, 24, 18, 15, 12, 10, 9, 8, 7, 6, 5, 4, and 3 in., with junctions and bends, at per foot; granite stone for pavement, at per foot (superficial); granite stone for kerb, at per foot run; granite channelling, 1 ft. 4 in. wide, with 10-in. curved channel, at per foot run, and granite channelling, flat, 1 ft. 4 in. wide, 6 in. deep, at per foot run. Particulars of W. Clemens, surveyor, Quay Street.
Tunbridge Wells.—March 30. Formation of roads and footways, also laying about 3,900 ft. of 12-in. or 9-in. glazed stoneware pipe sewers, with manholes, etc., for the High Brooms Brick and Tile Co. Particulars of W. Harmer, 137, London Road, Southborough.
Wanstead.—April 2. Tar-paving and laying kerb in roads in the district, for the U.D.C. Particulars of the surveyor, Council offices.
Wellingborough.—March 29. Supply of Hartshell Mount-sorrel and other granite for the R.D.C. Particulars of W. Jackson, clerk.
Whickham.—March 30. Supply and delivery of broken slag, whinstone, and limestone for the half year ending September 29, for the U.D.C. Particulars of T. Lambert, clerk, Town Hall, Gateshead.
Wick.—April 2. Repair of the road leading from the County Road to Weydale Quarry, and extension of same to Hillside Road. Particulars of J. Harrison, surveyor of roads.
Withington.—March 30. Supply of about 500 tons of good footpath gravel, for the U.D.C. Particulars of A. H. Mountain, surveyor, Town Hall.
Wolverhampton.—March 27. Supply of the following for one year from March 31, for the Corporation: Paving setts, macadam, Yorkshire and Haslingden flags, kerbs, paving bricks, etc. Particulars of J. W. Bradley, Town Hall.

SEWERAGE.

Greenock.—April 12. Construction of an outfall and relief sewer, with other incidental works, for the Board of Police. Particulars of the town clerk, Municipal Buildings.
Harrogate.—March 31. Construction of about 1,340 lineal yd. of pipe sewers and drains, and underdraining about four acres for irrigation at the Oatlands Estate. Particulars of Martin & Fenwick, 1, Park Place, Leeds.
Horfield.—March 30. Construction of about 400 yd. of pipe sewer, with manholes, etc., for the U.D.C. Particulars at the offices of the Council, 298, Gloucester Road.
Llandrindod Wells.—Extension of sewerage system, as follows, for the U.D.C.:—(1) Cutting and filling sewer; (2) Materials; (3) Carrying out the works completely. Particulars of D. C. Davies, clerk.
London, N.—March 29. Supply and construction of (1) 2,300 ft. 12-in. and 1,400 ft. 9-in. stoneware pipe surface water sewer in Fortis Green Road and Muswell Hill Road; (2) 880 ft. 9-in. stoneware pipe surface-water sewer in Jackson's Lane, Highgate; (3) 450 ft. 12-in. stoneware pipe surface-water sewer in High Street, Hornsey; (4) 560 ft. 9-in. stoneware pipe surface-water sewer in Falkland Road, Hornsey; (5) 200 fire hydrants and covers; (6) construction of 150 fire hydrant pits, for the Hornsey U.D.C. Particulars of E. J. Lovegrove, C.E., engineer to Council, Southwood Lane, Highgate, N.
Milnrow.—March 31. Laying out of about six acres of land for sewage filtration purposes; also construction of stores room, distributing wells, screening chambers, and other works for the U.D.C. Particulars of J. Diggle, C.E., 20, Alexander Street, Heywood.
Oporto.—July 31. Construction of drainage works in the city, for the Municipality. An English translation of the notice may be seen at the Commercial Department of the Foreign Office, London.
Rugby.—April 8. Construction of a 21-in. main outfall sewer (about 380 yd. in length), together with the manholes, junctions, and other works, from Wood Street through the Cattle Market to Abbey Street, for the U.D.C. Particulars of D. G. Macdonald, surveyor.
Stowmarket.—April 5. Laying of certain pipe sewers, etc., for the U.D.C. Particulars of Pollard & Tingle, engineers, 31, Old Queen Street, Westminster, London, S.W.
Woking.—April 22. Construction of about twenty-nine miles of sewers (cast-iron, concrete, and stoneware), diameter varying from 8 in. to 30 in., 473 manholes, lamp-holes, and flushing tanks on the lines of sewers; five miles of cast-iron power mains, 3 in., 4 in., and 5 in. diameter; four automatic pumping stations, settling tanks, and main pumping station, roads, fencing, etc., for the U.D.C. Particulars of J. Taylor, Sons, & Santo Crimp, 27, Great George Street, Westminster, London, S.W.

WATERWORKS.

Birmingham.—March 31. Construction of a lined service reservoir, to hold 200,000,000 gals., 18 filter beds, etc., for the Corporation. Particulars of J. Mansergh, 5, Victoria Street, London, S.W.
Edinburgh.—March 31. Laying and jointing 22-in. and 15-in. cast iron water-pipes at Mayfield Road, for the Edinburgh and District Water Trustees. Particulars of J. Wilson, C.E., 72A, George Street.
Stourport.—April 1. Excavating and laying a water main 928 yd. long, Bewdley Road, and providing materials, for the U.D.C. Particulars of the surveyor, Mitton Street.

CONTRACTS CLOSED.

Colchester.—For the supply and erection of cast-iron standards, Bessemer steel bars, and gates, for the reconstruction of C. M. Stanford's auction mart in the Colchester Cattle Market, for the Estate and Cattle Market and Executive Committee of the Corporation. Lloyd & Co., Abercarn; £341 4s.
Combs.—For erection of six cottages on the Needham Road, for J. Bird. Lowest tender, J. Death & Sons, Bildeston; £996.
Crosby.—For the execution of works of sewerage, for the Cockermouth R.D.C. J. T. Watson, Allonby; £187 14s. 3d.
Crosshaven.—For erection of a dwelling-house and business premises. J. Sisk, Cork; £600.
Dartford.—For the construction, kerbing, and paving with artificial stone of a footpath of about 206 super. yd. in Mill Road, for the U.D.C. J. Mowlem & Co., London, S.W.; £74.—For the laying of about 713 yd. of 10-in. stoneware pipe sewer, and constructing the manholes and other works connected therewith on East Hill, for the U.D.C. G Bell, Tottenham; £697.
Derby.—For rebuilding the branch post office and sorting office at Midland Road, for the Commissioners of H.M. Works and Public Buildings. Groom & Co. Ltd.; £6,020.
Dewsbury.—For erection of seven dwelling-houses on the Northfields Estate. W. Oates, Mirfield, masonry and bricklaying; J. Richardson & Sons, carpentry and joinery; J. Shipley, plumbing; F. Grange, Heckmondwike, plastering; J. Thornton, slating; Porrit & Bray, painting.
Dukinfield.—For erection and completion of a detached villa residence in Old Road, for T. W. Stansfield. C. Keswick, Ashton-under-Lyne.
Farnborough.—For alterations to the "George and Dragon" public-house, for Page & Everton, Ltd. Graham & Co., Beckenham; £192.
Folkestone.—For erection of mortuary buildings. J. Q. Petts & Son; £335 12s.
Friern Barnet.—For kerbing, channelling, making up, etc., portions of Friern Barnet Road, Colney Hatch Lane, and Oakleigh Road South, for the U.D.C. W. Griffiths; £883 11s. 2d.
Gainsborough.—For supply of granite and slag during year ending March 31, 1898, for R.D.C. Granite: Kaltenbach & Schmitz, Hull; Ord & Maddison, Darlington; Ellis & Everard, Bardon Hill; Chainwood Granite Co., Loughborough; Groby Granite Co., Leicester. Slag: Frodingham Iron Co., Frodingham; W. Prestwich, Dronfield; Renishaw Iron Co., Renishaw.
Halifax.—For the construction of about 200 lin. yd. of 12-in. pipe sewer, for the Halifax R.D.C. J. Balmforth, Elland; £73.
Harrogate.—For flagging and kerbing the footpath in Parliament Street, adjoining the new baths, for the Corporation. J. L. Matthews; £110 12s.—For draining, levelling, paving, metalling, kerbing, channelling, and lighting St. Mary's Avenue, for the Corporation. T. Park; £423 16s. 1d.
Hastings.—For the supply and delivery to Hastings Station of 350 cast-iron ornamental standards, for the Corporation. J. Page & Co., Dereham; £149.
Keighley.—For erection of a new pavilion at the hospital, Morton Banks, for the Keighley and Bingley Joint Hospital Board. W. Foster, Bingley, masonry; Foster & Fortune, Ingrow, joinery; T. Nelson, Bradford, slating; H. Walker, Bingley, plumbing; J. Pickles, Bingley, plastering; H. Walker, Bingley, painting.
Hereford.—For erecting a hall and other buildings for the parish of St. Peter. Beaven & Hodges; £1,173.

CONTRACTS CLOSED (*continued*)—

Hexham.—For proposed buildings at Lionel Mill. G. A. King, Newcastle-on-Tyne; £890.

Horsham.—For erection of shops etc. West Street, for Colonel J. Clifton Brown. Potter Bros.; £1,973.

Kidsgrove.—For erection of public offices, for the U.D.C. C. Cope, Tunstall; £2,946.

Knaresborough.—For street works, etc., for the R.D.C. F. W. Simpson, Leeds, Starbeck Street, £416 15s. 8½d.; New Park, Park Street, £190 0s. 10d.

Leyton.—For erection of sheds for water van and steam road roller, for the U.D.C. F. J. Coxhead, Leytonstone; £485.—For construction of a sewer in Boundary Road, for the U.D.C. — Jackson; £297.

Littlehampton.—For alterations and additions to the "Nelson and Victory" hotel in Pier Road. — Ayling, Arundel.

Liverpool.—For supplying and fixing wrought-iron balcony at the City Hospital in Netherfield Road, for the City Council. W. H. Peake & Sons; £38 10s.—For alterations and enlargement of the second police court, for the City Council. Brown & Backhouse; £1,930.—For alterations to entrance to St. John's Market, for the City Council. W. Tomkinson & Sons; £157.

London.—For sundry alterations, additions, and decorations to St. Mildred's House. General Builders, Ltd.; £981 15s.—For repairing stoves at Hammond Square school, for the School Board. Hendry & Pattison; £8.—For erection of school, Ambler Road, for the School Board. Lowest Tender, C. Cox; £16,447.—For heating Gipsy Road school, for the School Board. Lowest tender, Duffield & Co.; £40. **N.**—For painting and decorating Manhattan Mansions, Holloway. Wilkinson Bros.; £245. **N.W.**—For sanitary and decorative repairs to 12, Uppedans Road, Regent's Park. J. Sims, Regent's Park; £304. **S.E.**—For erection of new business premises in Offley Road, Kennington Road, for J. A. Sharwood & Co. Edward & Medway; £3,223.

Martley.—For drainage works at Upper Wick, St. Johns, for the R.D.C. J. Butler, Worcester; £131 10s.

Middleton.—For sewering, levelling, paving metalling, flagging, channelling, etc., of Booth Street for the Corporation. T. Kilburn, Bolton; £521 17s.

Midsomer Norton.—For the execution of certain works of sewerage and sewage disposal at Welton and Midsomer Norton, for the U.D.C. Thomas & Webb, Bristol; £1,995 4s. 1d.

Moulton.—For erection of a cookery room at the Board schools, for the School Board. J. Rylance & Sons, Northwich; £293.

Needham Market.—For erection of a house, for G. Cooper. Lowest tender, H. Plummer, Rattlesden; £1,599.

New Barnet.—For erection of a villa residence, for J. Rowley. Lowest tender, — Butcher; £1,085.

Omagh.—For building a bridge across the river Strule, for the Grand Jury of Co. Tyrone. J. Neilly; £2,400.

Orpington.—For additions and drainage works to a private residence. Somerford & Son; £166—For erection of infants' school, and alterations to existing school buildings, at the Chiselhurst Road Board schools. Lowest tender, Somerford & Son; £2,473.

Oxenhope.—For erection of store and seven houses in Station Road, for the Uppertown Industrial Co-operative Society, Ltd. J. & J. Crabtree, masonry; H. Whitaker, joinery; Hill & Nelson, Bradford, slating; G. Edmondson, Lees, plastering; F. Raw, plumbing.—For erection of six houses at Goose Green. J. & J. Crabtree, masonry; W. Wright, joinery; W. Thornton, Bingley, slating; J. Brearley, Keighley, plastering; F. Raw, plumbing. Total, £1,200.

Paignton.—For erection of a police station and sessions hall in Palace Avenue, for the Devon Standing Joint Committee. Dart & Pollard; about £3,900.

Plymouth.—For the reconstruction of the sewer in Hoste Park Road, for the Corporation. T. Shaddock; £756 13s. 6d.

Purley.—For erection of a small pox hospital, for the City Council. J. Isaac & Sons, Coventry; £3 169 13s. 6d.

Rawtenstall.—For supply of materials during twelve months ending March 25, 1898, for the Corporation. Lupton & Co., Liverpool, road metal, Bold Venture Lime Co. and Threekeld Granite Co.; chippings; Brooks & Pickup, Burnley, earthenware pipes; J. Hargreaves & Co., gully grate castings; J. Duckett & Sons, cement.

Retford.—For converting buildings into two houses, for F. Bannister. F. Fenton; £246.—For construction of about 2,050 yd. of sewers, consisting of 12-in. and 9-in. pipe sewer, with manholes, etc., for the City Council. A. Braithwaite & Co., Leeds; £1,567 8s. 9d.

Rochdale.—For alterations and additions to the "John Street" tavern, for the Phœnix Brewery Co., Ltd. R. Robinson & Son.

Rushden.—For erection of two houses, Oakley Road, for Mrs. Southam. F. K. Henson, Finedon; £565.

St. Albans.—For new printing works for Smith & Co. Lowest tender, C. Miskin; £7,130.

St. Helens.—For enlargement of St. Helens post-office, for H.M. Office of Works. J. Rothwell & Sons; £2,433.

Shipley.—For erection of wool-combing works, shed, warehouse, chimney, etc. W. Dagkin, Manningham, masonry; Rhodes Bros., Saltaire, joinery for shed; W. G. Bogg, Manningham, joinery for warehouse; G. & R. Nunns, Rawdon, plumbing; C. Howroyd & Sons, Bradford, plastering; T. Nelson, Bradford, slating; J. Cliffe & Co., Bradford, cast iron work; R. H. Dewhurst, Bradford, wrought ironwork.

Southampton.—For the supply of about 3,000 tons of 24-in. cast-iron pipes and special castings, for the Corporation. Contract divided between Cochrane & Co., Dudley; J. Oakes & Co., London; T. Stewart & Co., Glasgow; and R. Laidlaw & Son, Glasgow.

Southend-on-Sea.—For erecting the superstructure of the Hotel Victoria. W. Pattenson & Sons, London, S.W.; £17,327.—For the construction of a winter garden on pier, for the Corporation. Dupont & Co.; £5,316, recommended for acceptance.—For the construction of underground conveniences in High Street, for the Corporation. A. E. Symes, Stratford; £2,795 18s.

Stanwell.—For erection of a dining hall at their workhouse. W. Glanville, Bedford; £452 10s.

Stockport.—For private street works, for the Corporation. P. D. Hayes; £701 11s. 1d.

Stowmarket.—For erection of ten cottages in Crown Street, for C. Marriott. Lowest tender, Cheerry & Gillson; £1,800.

Straiton, N.B.—For laying a new water-main, for the Edinburgh and District Water Trustees. J. Young & Sons; £1,207.

Sutton, co. Dublin.—For erection of three new dwelling-houses. R. Johnson; £2,150.

Swanwick.—For erection of a dwelling-house. Taylor & Parkin, Leabrooks; £297.

Swords, co. Dublin.—For erection of a dispensary, for the Balrothery Board of Guardians. J. Reid, Garristown; £490.

Tadcaster.—For supply of broken granite, road metal, etc., for the R.D.C. Granite: Ord & Maddison, 11s. 1d. per ton for 1,000 tons; Bradley Bros., 11s. 1d. for 1,000; G. Hodsman, 11s. 1d. for 1,000; J. Delnney, 10s. 6d. for 1,000; Shap Granite Co., Ltd., 10s. 8d. for 1,000; Sommerfield & Mead, 9s. 6d. for 500. Whin: C. Hornsey, 10s. 3d. per ton for 500 tons, G. F. Bolgiase, 10s. 11d. for 1,500. Slag: G. Hodsman, 7s. 3d. per ton for 1,000 tons; Leeds Steel Co., Ltd., 5s. 9d. for 1,000; J. Green & Co., 7s. 5d. for 1,000. Limestone: J. Green & Co., 7s. 1d. per ton for 3,000 tons; Skipton Rock Co., Ltd., 6s. 8d. for 1,000.

Trimley.—For erection and drainage of laundry, for S. L. Harlock. F. C. Thurman, Walton, erection £7 9 19s.; drainage, £87.

Uckfield.—For certain works of sewage disposal, for the U.D.C. Lowest tender, H. Holman, Brighton; £522 3s. 6d.

Walsall.—For constructing a main sewer of 12-in. and 9-in. pipes in Mellish Road, for a total length of 633 yd., together with the necessary manholes, ventilators, etc., for the Corporation. H. Holloway, Wolverhampton; £828 6s.

Wanstead.—For making up Pelham Road and part of Pulteney Road, for the U.D.C. J. Reeves, Walthamstow; £428.

Weymouth.—For erection of a villa residence, for F. A. Risley. — Stevens; £350.

Watford.—For sewering, levelling, paving kerbing, metalling, flagging, channelling, lighting, and making good Francis Road, for the U.D.C. F. Dupont; £323.

APPOINTMENTS OPEN.

Borough Accountant.—March 27. Required by the Devonport Town Council, applications for the position of borough accountant. Salary £208 per annum. Applicants must not be less than twenty-seven years of age, and must have had previous experience in a borough accountant's office. Particulars of A. B. Pilling, town clerk, Devonport.

Building Surveyor.—March 30. Required by the Shoeburyness U.D.C., applications for the appointment of building surveyor. The officer will have no duties in connection with the repair, etc., of the roads. He will be required to examine plans of new buildings and works, and report to the Council as to their being in conformity with the bye-laws, to inspect works during construction, to grant certificates of completion, supervise connections with the sewers and to perform such other similar duties as the Council may from time to time require. Further particulars of F. Gregson, clerk, Southend-on-Sea.

Clerks.—March 27. Required a junior clerk, not less than eighteen years of age. Must be a neat and quick writer, and quick and accurate at figures. A thorough knowledge of shorthand is indispensable. Particulars of the city engineer, Oxford.—March 30. Required by the Tong U.D.C., a clerk to devote the whole of his time to the duties, which will include rate collecting, etc. Particulars of the Council, Tong, Bradford.

Electrical Engineer.—March 29. Required by the St Pancras Vestry (London, N.W.), a competent distributing engineer who has had experience in a cable factory and in the laying and maintenance of electricity cables, etc. Age between twenty-five and forty. Salary £200 per annum, increasing £25 annually to £250 per annum. Particulars of C. H. F. Barrett, vestry clerk, Vestry Hall, St. Pancras Road, London, N.W.

Pavior.—April 6. Required by the Acton District Council, a pavior able to assist in bricklaying and road and sewer repairing. Wages 30s. per week. Particulars of D. J. Ebbetts, surveyor, 242, High Street, Acton.

Surveyor.—March 27. Required by the Upper Axe District Drainage Board, a surveyor. Particulars of S. F. Goodall, clerk, Wells, Somerset.

APPOINTMENT CLOSED.

Heywood.—Borough surveyor. J. A. Settle, Bolton.

COMPETITIONS OPEN.

Christiania.—Norwegian and foreign engineers are invited to take part in a competition for the drawing up of a plan (to be in by March 31) concerning the arrangement of stations for the railways terminating at Christiania. Four prizes of kroner 10,000, 4,000, 2,000, and 1,000 respectively are offered for the best plans. Particulars can be obtained at the railway offices of the Department of Public Works, Victoria Terrace, No. 6.

Elne, France.—Schemes, by July 1, for a water supply for 3,500 inhabitants. Particulars of La Mairie, Elne, Pyrenées Orientales.

Govan.—Plans, by March 31, required by the Commissioners of the burgh of Govan for public halls and municipal offices upon a site recently acquired by them. Particulars of A. Macdonald, town clerk, Hillock House.

Guernsey.—Plans, by April 17, required by the States of Guernsey for a new States assembly hall and adjuncts proposed to be erected adjoining the Royal Court House, at a cost not to exceed £15,000. Premiums of £100 and £50 are offered for the two plans, which may, in their order of merit, be judged by the States most suitable for the purpose, the successful plans and designs to become the absolute property of the States, to adopt in whole or in part as they may deem it necessary or desirable, without further payment to the successful competitors. Further particulars of N. Domville, supervisor of the harbour, etc States Offices.

Halifax.—Designs by April 30 required by the Council for a police station, court house, etc. Premiums of £50 and £25 are offered for the two best designs. Particulars of E. R. S. Escott borough engineer.

Long Buckley.—Schemes, by April 21, required by the R.D.C., for supplying Long Buckley with water. Estimated population 2,000. A premium of thirty guineas will be given for the scheme which, in the opinion of the Council, is the best and most practicable. The successful competitor or his nominee will, on giving satisfactory security to the Council, be employed on the usual terms as engineer of the works if his scheme is carried out. Further particulars of W. Willoughby, jun., clerk, Daventry.

DISSOLUTIONS OF PARTNERSHIP.

CHAPMAN, FRANK, and FENTON, JAMES, trading as Chapman & Fenton, builders and contractors, of 99, Banks Lane, Stockport, Chester. From February 28. Debts by F. Chapman.

CLYRE, HENRY, and BUCKLAND, HERBERT, trading as Clyre & Buckland, surveyors and architects, of 81, Edmund Street, Birmingham. From March 17.

FREND, ALFRED BLACKBURNE, and KEOGH, CHARLES GEORGE, trading as Frend & Keogh architects and surveyors, of Bloomsbury Mansions, 14, Hart Street, Bloomsbury, London, W.C. From December 25, 1896.

HAMILTON, SYDNEY, and BROWN, ALBERT EDWARD, trading as Brown & Hamilton, builders contractors, etc., of Thurnscoe, near Rotherham, York. From March 10. Debts by S. Hamilton.

SYKES, JOHN, and ROSCOE, THOMAS, trading as Sykes & Roscoe, builders, of Stockport. From March 3, 1897.

BANKRUPTCY PROCEEDINGS.

NOTE.—*The following particulars are taken from the* LONDON GAZETTE *and legal records, and the official information is assumed to be correct, but we accept no responsibility for inaccuracies.*

THE following abbreviations are used: P.F., petition filed; R.O., receiving order; Adj., adjudication; 1st mtg., first meeting; Pub. exam., public examination; O.R., official receiver; div., dividend; app., application.

ALLEN CHARLES WILLIAM (trading as C. Allen & Son), builder, plumber, and house decorator, 18, High Street, Barnet, Herts. Claims on or before Ap. 3 to C. Mercer, O.R.'s office, 95, Temple Chambers, Temple Avenue, London, E.C.

BATES, ALFRED and STEVENS, WILLIAM (co-partners), builders, 36, Windsor Road, Willesden Green, London, N.W. App. for discharge Ap. 7, 11 a.m., Bankruptcy Buildings, Carey Street, London, W.C.

BEALE, WILLIAM, builder, 2, Lorne Villas, Hibernia Road, Hounslow, Middlesex. Adj. Mar. 17.

BOWLES, GEORGE, builder, 87, Cornwall Terrace, Glyn Road, Homerton. Claims on or before April 6 to R. T. Tatham, O.R., 9, King Street, Maidstone.

CLARKE, RICHARD BUTLER, the younger, builder, The Hollies, Grove Road, Chichester, Sussex. 1st and final div. of 3d., April 5, offices of trustee, P. A. Boulton, 110, Cannon Street, London, E.C.

CRAGG, SARAH RHODES, plumber and glazier, 59, Bradford Road, Cleckheaton, Yorks. P.F., R.O., and Adj. Mar. 15. 1st mtg. Mar. 31 11 a.m. O.R.'s Chambers, 31, Manor Row, Bradford. Pub. exam, Ap. 9, 10 a.m., County Court, Manor Row, Bradford.

CRAVEN, THOMAS, plasterer and slater, Oak Lane, Manningham, Yorks. 1st mtg. Mar 25, 12 noon, O.R.'s chambers, 31, Manor Row, Bradford. Pub. exam. Ap. 9, 10 a.m., County Court, Manor Row, Bradford.

GOODE, J., builder, 1, Fernlea Villas, Palmerston Road, Walthamstow, Essex. P.F. Mar. 2. R.O. Mar. 19.

GOSLING, WILLIAM, house decorator, Orchard Road, Kingston-on-Thames, Surrey. P.F. and R.O. Mar. 18.

GRIFFIN, WILLIAM, builder, Broadstone, Canford Magna, Dorset. 1st and final div. 2s. 6d. Mar. 31, O.R.'s offices, Salisbury.

GROVER, HENRY, builder and contractor, Laurel Cottage, Mandeville Road, Enfield Highway, Middlesex. P.F. and R.O. Mar. 16. Adj. Mar. 18.

HOLMES, ALLEN, builder and contractor, Railway Saw Mills, Turner Street, Ashton-under-Lyne. Claims on or before Ap. 1 to E. Lawton, 14, Brown Street, Manchester.

LEWIS, HENRY DAVID, builder, 1, Ottawa Terrace, Victoria Road North, Southsea, Hants. App. for discharge April 8, 12 noon, Court House, St. Thomas Street, Portsmouth.

NICHOLLS, ALFRED GEORGE (trading as Nicholls & Co.), plumber, painter, etc., 3, Topsfield Parade, Crouch End, Middlesex. Claims on or before Ap. 3 to H. Brougham, O.R., Bankruptcy Buildings, Carey Street, London, W.C.

ORMROD, WILLIAM, brick and tile manufacturer, Warrington Road, Pemberton, Lancs. Claims on or before April 5 to T. H. Winder, O.R., 16, Wood Street, Bolton.

SAULT, WILLIAM, builder, Wymeswold, Leics. 1st and final div. 1s. 8d., Mar. 30, O.R.'s office, 1, Berridge Street, Leicester.

SHAW, WILLIAM, plasterer, 7A, Greenside, Pudsey, Yorks. P.F., R.O., and Adj. Mar. 15. 1st mtg. Mar. 31, 12 noon, O.R.'s Chambers, 31, Manor Row, Bradford. Pub. exam. April 9, 10 a.m., County Court, Manor Row, Bradford.

SMITH, JOHN HENRY, builder, 47, Potter Street, Worksop, Nottinghamshire. 1st mtg. Mar. 26, 2.30 p.m. O.R.'s offices, Figtree Lane, Sheffield. Pub. exam. Ap. 1, 3 p.m., County Court Hall, Bank Street, Sheffield.

TODD, GEORGE FRANCIS, builder and contractor, 6, Parker Street, Derby. Claims on or before April 6 to T. H. Harrison, 18, Wardwick, Derby.

VICARY, WILLIAM HENRY, builder, 12, Mirabel Road, Dawes Road, Fulham, London, S.W. P.F. Mar. 3. R.O. Mar. 18.

VINE, WILLIAM, builder, William Street, Weymouth, Dorsetshire. 1st mtg. Mar. 27, 12.30 p.m., O.R.'s offices, Salisbury. Pub. exam. 12.15 p.m., County Hall, Dorchester.

WHEELER, ALFRED, builder, Emsworth Road, Lymington, Hants. 1st and final div. 3s. 4½d., Mar. 25, O.R.'s offices, 4, East Street, Southampton.

WILLIAMS, JAMES, builder and contractor, Cenorth House, Pontypridd, Glam. 1st and final div. 1s. 9¾d., Mar. 30, O.R.'s office, 65, High Street, Merthyr Tydfil.

WORRICKER, JOHN, builder, Colchester. Essex. P.F., R.O., and Adj. Mar. 15. 1st mtg. Mar. 25, 11.30 a.m., Cups Hotel, Colchester. Pub. exam. April 2, 2.30 p.m., Town Hall, Colchester.

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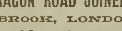
8½" or 9" × ⅞" × ⅛".  350 in 1 cwt.

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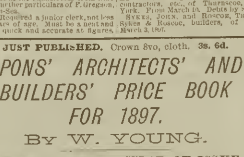

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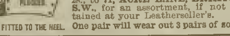

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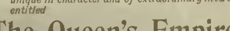

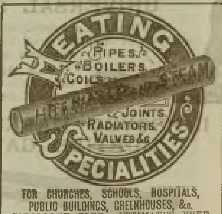

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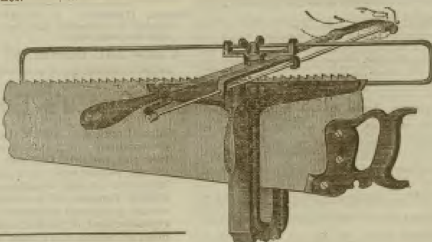

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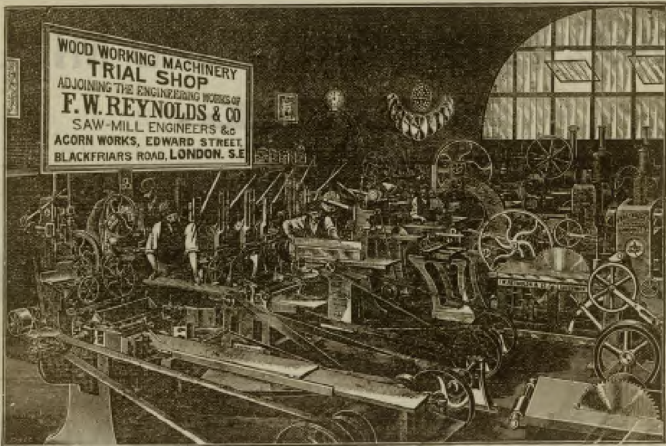

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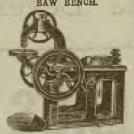

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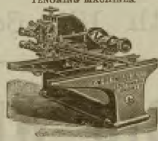

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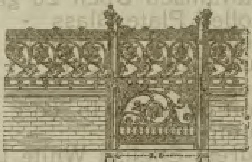

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