C. L. HOLT.

ROOF CONNECTION FOR DRAIN PIPES.

APPLICATION FILED MAY 15, 1916.

1,275,922.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

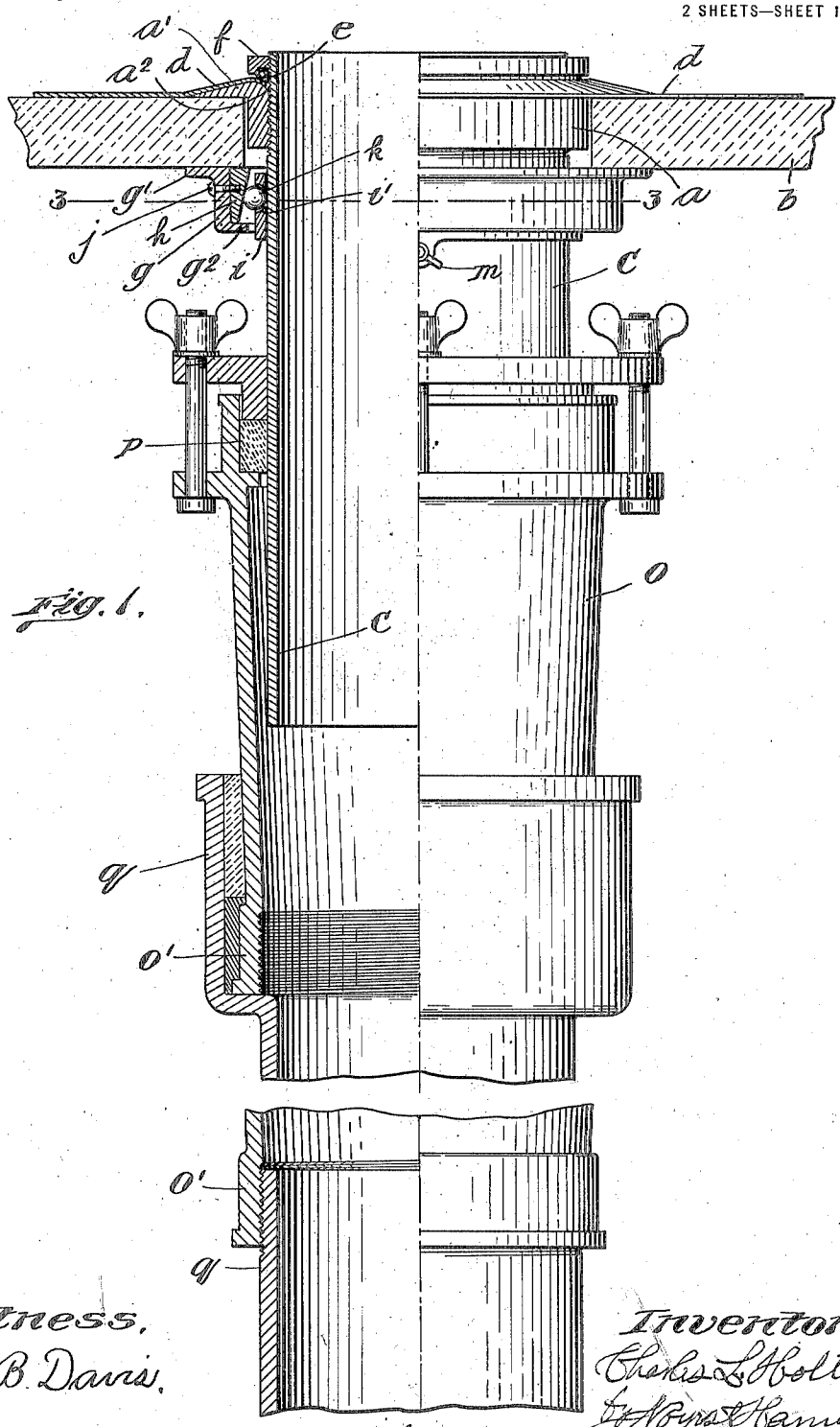



Fig. 1.

Fig. 2.

Witness,
H. B. Davis.

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Atty's

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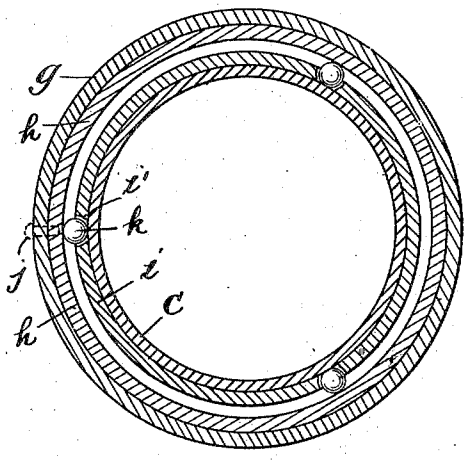



Fig. 3.

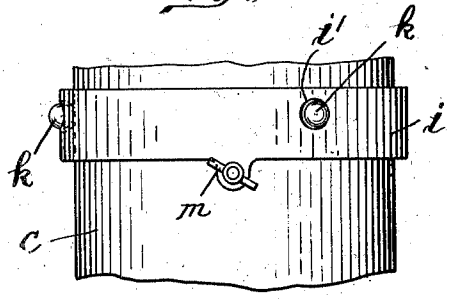



Fig. 4.

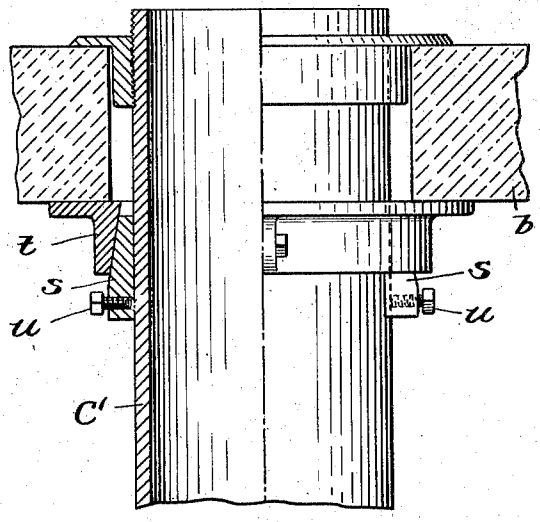



Fig. 5.

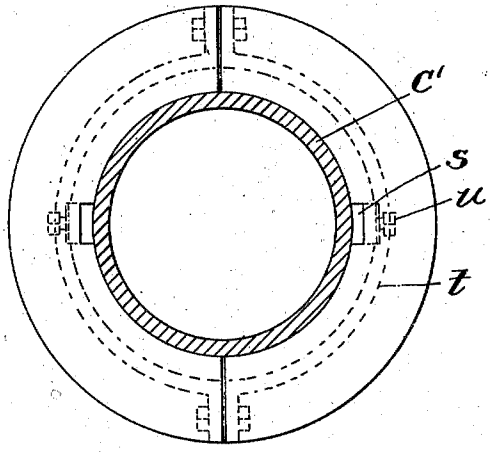



Fig. 6.

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# UNITED STATES PATENT OFFICE.

CHARLES L. HOLT, OF LAWRENCE, MASSACHUSETTS, ASSIGNOR TO HOLT ROOF CONNECTION CO., OF LAWRENCE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## ROOF CONNECTION FOR DRAIN-PIPES.

1,275,922. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed May 15, 1916. Serial No. 97,506.

*To all whom it may concern:*

Be it known that I, CHARLES L. HOLT, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented an Improvement in Roof Connections for Drain-Pipes, of which the following is a specification.

This invention relates to certain improvements in drain-pipe roof-connections of the type disclosed in my prior Patent #1,059,671, and more particularly to certain improvements on the specific device therein shown.

A single roof-fitting, of the specific form illustrated in said patent, is adapted only for roofs of approximately a certain thickness. This fact makes it necessary to provide different fittings for roofs of different thicknesses, in which the roof-engaging means at the upper and lower ends of the fittings are positioned at different distances apart. This results in increased expense, and, in many instances, in inconvenience. Also, if the roof happens to be of greater thickness than the ordinary wooden roof, the length of the casting must be substantially increased, resulting in corresponding increase of the weight of the casting and its cost.

In numerous instances, the under surface of the roof is not in a plane parallel to the upper surface thereof, so that in my said prior device the engaging means for the under side of the roof does not bear evenly thereon, which is to an extent objectionable.

In the device of said prior patent, the roof pipe was made of brass, principally to permit a soldered joint to be made between the upper end of said pipe and the roof flashing, causing a substantial increase in cost over an iron pipe.

The objects of my invention are to obviate the objections to the specific device of my said prior patent, above referred to, and to improve said device by providing a form of roof connection which is adapted to be locked in roofs of widely-varying thicknesses, or roofs having the under side thereof somewhat out of parallel with the upper side.

I accomplish these objects in part by employing a clamping-ring for the under side of the roof, which is adjustable with relation to the fitting which engages the upper side of the roof and is adapted to be locked by a wedging device, which permits the ring to be readily forced up against the under side of the roof, but automatically locks it against downward movement, so that the force of its locking engagement will be increased as the downward pressure thereon is increased, and also by providing a form of connection between the roof pipe and the roof surface, which obviates the necessity of a soldered joint;—these and other objects being accomplished by the means shown in the accompanying drawings, in which:—

Figure 1 is a view, partly in elevation and partly in central vertical section, of a drain pipe roof connection illustrating an embodiment of my invention.

Fig. 2 is a similar view showing its use in connection with screw-threaded pipes.

Fig. 3 is a cross sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a detail view of the ball-retaining ring employed in connection with the wedging device illustrated in Figs. 1 and 3.

Fig. 5 is a view, partly in elevation and partly in central vertical section, illustrating a modified form of my invention.

Fig. 6 is a sectional view on the line 6—6 of Fig. 5.

According to my invention, I provide a roof-collar *a*, having a flange *a'* on its upper end, said collar being adapted to be inserted through an aperture formed in the roof *b*, and its flange being arranged to rest on the upper side of the roof to support the same. The roof pipe *c* which is extended through the roof-collar, may, in the present instance, be made of galvanized iron, instead of brass, the upper end thereof being externally threaded, and the roof-collar being correspondingly threaded, internally, and screwed onto the pipe for a suitable distance, so that the pipe *c* protrudes for a substantial distance beyond the upper surface of the collar. The bore of the collar, at its upper end, is flared outwardly or beveled, to provide a seat $a^2$, and the usual flashing *d*, of thin sheet metal, having an aperture therethrough for the end of the pipe, is placed on the collar and its edge-portion, about its aperture, is bent down against said seat $a^2$.

A tubular lead packing ring *e* is then placed on the upper side of the flashing about the pipe, and a nut *f* is screwed onto

the protruding end of the pipe, until the ring *e* is firmly clamped against the flashing, and wedged into the annular recess about the pipe provided by the beveled seat $a^2$. A perfectly water-tight joint is thus formed between the flashing plate and the upper end of the pipe. The flashing is adapted to extend over the flange of the collar and onto the surface of the roof as customary, so that the tar and gravel covering may be placed thereon, to the level of the upper end of the pipe *c*.

While the collar *a* will hold the pipe *c* against downward movement with relation to the roof, the collar, *per se*, is not provided with means for holding it against upward movement, as in the device of my said prior patent, and in lieu thereof I provide an independent clamping ring which is adjustably mounted on the pipe and is adapted to be pressed against the under side of the roof and locked on the pipe in the position to which it is adjusted, so that the pipe is firmly held against movement either up or down with relation to the roof.

While I have previously employed set screws for holding this clamping ring in place, I have found them to be unreliable, for the reason that workmen, in installing the fixture, are liable not to tighten them sufficiently, sometimes because they do not have a suitable tool conveniently at hand, for the purpose, and for other reasons, and, unless they are set up very firmly, they are liable to slip.

To obviate these difficulties, I have produced a form of clamping ring and locking mechanism therefor, which enables the ring to be locked in place without employing tools, and which, while adapted to be readily moved up into position to engage the under side of the roof, automatically locks the ring against opposite or downward movement with a force which increases as the tendency to dislodge the ring increases.

A preferable form of device for this purpose is illustrated in Figs. 1, 3, and 4, and comprises a clamping ring *g* having an outwardly-turned roof-engaging flange *g'* and an inwardly-turned supporting flange $g^2$ at its under side, the inner surface of the ring above the flange $g^2$ being cylindrical and adapted to receive a wedging ring *h*, having a conically-formed inner peripheral face which converges from the under side upward. I further provide a series of wedging devices in the form of steel balls *k* which are disposed between the inclined surface of the ring *h* and the surface of the pipe *c*, and provide a retaining ring *i* therefor, said retaining ring having openings therein in which the balls are located and being adapted to fit loosely on the pipe and within the edge of the supporting flange $g^2$, so that it may depend therebelow. In placing these parts in position, the ring *i* with the balls therein are placed within the ring *g* from the upper side of the latter, so that the balls rest on the flange $g^2$ and then the wedging ring *h* is dropped into place within the ring *g*, and preferably secured by screws *j*, so that the parts will not become disassociated. When the fitting is installed, the workman places the clamping ring and its associated parts on the pipe *c*, which has already been set in place, and then pushes the ring *g* up against the roof, after which he pushes up the ring *i* until the balls are wedged firmly in between the inclined surface of the ring *h* and the surface of the pipe *c*, locking the ring *g* on the pipe. With this arrangement any tendency to push the ring *g* downward will cause the balls to lock the ring with increasing force. As a matter of additional security, the ball-holding ring *i* is provided with thumb screws *m* for holding it against downward movement on the pipe, so that the balls will be constantly held in wedging position, and tendency to cause upward movement of the pipe in the roof, which might cause a strain on the screws *m* will immediately cause increased wedging action of the balls, thereby increasing the resisting force correspondingly.

As shown in Fig. 1, the internal diameter of the rings *g* and *h* is substantially greater than the external diameter of the iron pipe *c*, so that, in case the underside of the roof should be inclined with relation to the center line of said pipe when the latter is in position, said rings may be correspondingly tilted or inclined, so as to engage the roof uniformly, in which position they may be locked by one or more of the wedging balls.

In Figs. 5 and 6, a somewhat simplified form of adjustable clamping means for the under side of the roof, is shown, which comprises a flanged ring *t*, preferably made in two parts, and adapted to be bolted together, so that it may be placed in position on the pipe *c* after all the pipe connections have been made. In this form of my invention, transverse grooves or slots are formed in the middle of each ring section, the bottom surfaces of which are inclined so that they converge as they extend upward. A wedge-shaped key *s* is provided for each slot which is driven upwardly therein, while the ring *t* is held against the under side of the roof, so that it becomes wedged between the inclined surface of the ring *t* and the surface of the pipe.

Said keys *s* are preferably secured against slipping on the pipe *c'* by thumb or set screws *u*, so that any tendency of the pipe to move up, or of the roof to move down, will tend to cause the collar *t* to ride upon the inclined outer sides of the keys, thereby increasing the locking effect of the keys.

By forming the collar *t* in two sections, it may also be readily adjusted for small variations in the size of the cast iron pipe; that is, if the pipe is too large for the collar, the bolts which clamp the sections together may be loosened, or if it is found that the underside of the roof is inclined with relation to the pipe, if the collar fits the pipe too closely to permit the collar to be tilted thereon to the desired extent, to conform to the inclination of the roof, it will merely be necessary to loosen the bolts and place the collar in such a position that its diameter in the direction of the inclination may be increased sufficiently to permit the collar to be tilted on the pipe to the necessary extent. It will be apparent that the keys or wedges may be driven in, to lock the collar to the pipe, as advantageously and easily, and will lock it as effectively, as if the collar were in a position exactly at right angles to the pipe, while, at the same time, the collar will bear uniformly against the under side of the roof.

It will be observed that either of the above-described forms of clamping means may be readily placed in position, even in places somewhat difficult of access, and that, while a hammer is preferably employed in driving in the keys, no tool whatever need be employed in connection with the installation of the form first described.

In the device of my said prior patent, the roof pipe was arranged to telescope with a cylindrical pipe having a calk joint connection with the iron drain pipe, which extended downward therefrom, so that the inlet to the drain pipe was of smaller internal diameter than the drain pipe. This was objectionable, for the reason that, if the roof pipe was of sufficient size to carry away the roof water, then the drain pipe was of greater diameter than necessary.

To obviate this difficulty, I have provided a form of connection for the roof pipe which enables the latter to be used in connection with a drain pipe having the same internal diameter as the roof pipe.

To this end, I provide an improved form of connection between the iron drain pipe and the roof pipe *c*, in which the stuffing box, or slip-joint connection, is arranged, said fitting consisting of a pipe section *o*, having a stuffing box *p* in its upper end, into which the pipe *c* extends, to provide a slidable connection therewith, said pipe-section *o* being formed to taper from its upper to its lower end, and the internal diameter thereof being sufficient to receive the pipe *c* telescopically and permit movement therein without engaging the walls of the pipe section *o*, and the lower end being contracted sufficiently to permit of its insertion in the hub of a cast iron pipe *q*, the internal diameter of which is the same as the internal diameter of the pipe *c*. To assist in the formation of a calk joint at the lower end of the pipe section *o*, which will be secure, the walls of the lower end of the pipe section *o* are thickened, exteriorly, providing a laterally projecting rib *o'* against which the soft solder may be forced, when the calked joint between the pipe section *o* and the drain pipe is formed, and, on account of the tapering of the pipe *o*, the space between it and the interior wall of the hub is narrower at the top of the hub than at the bottom, so that, when the molten lead is poured into it, a very rigid joint will be formed.

In roof drainage, it is common practice to employ iron pipes which are connected by screwthreads, in lieu of the ordinary pipe having a hub at one end, and to adapt the pipe *o* for both forms of drain pipe, the thickened lower end of said pipe *o* is internally screw-threaded, to receive the threaded end of an iron pipe *q*.

The necessity of providing two different forms of pipe-sections *o*, is avoided, and, at the same time, means are provided whereby a roof pipe may be employed, the internal diameter of which is at least as great as that of either the hub or the screw-threaded pipe.

I claim:—

A roof connection comprising a roof-collar, adapted to be inserted in the roof opening and having a flange adapted to rest on the upper side of the roof, to hold the collar against downward movement therein, a pipe rigidly connected to said collar, a clamping collar, for the under side of the roof, of substantially greater internal diameter than the external diameter of the pipe and adjustable on the pipe to different positions and inclinations relative thereto, a locking wedge adapted to be forced upwardly in the space between said pipe and clamping collar, to hold the latter against downward movement on the pipe from the position to which it may be adjusted, and a yielding connection for the lower end of said pipe.

In testimony whereof, I have signed my name to this specification.

CHARLES L. HOLT.

Witness:

L. H. HARRIMAN.