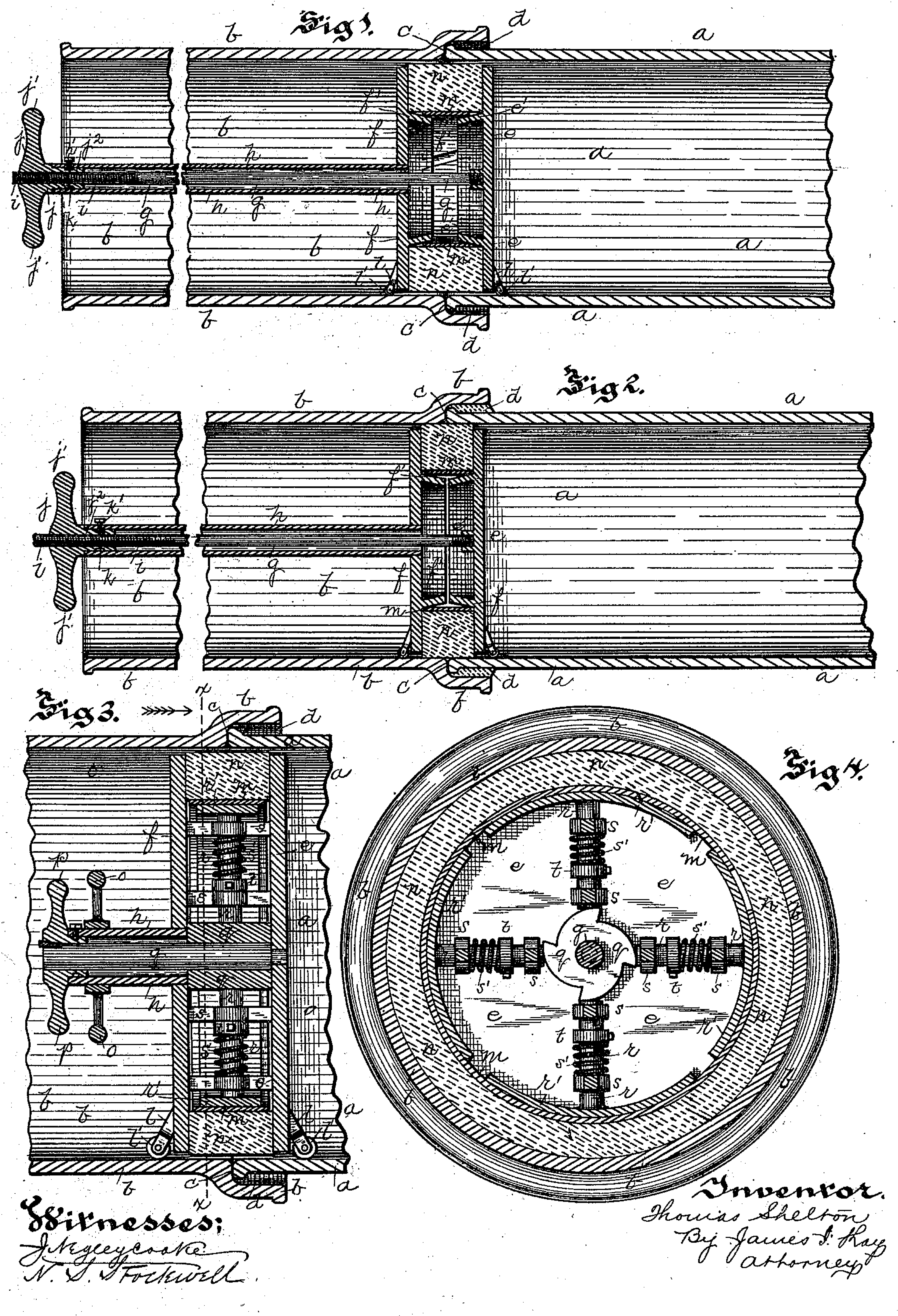
(No Model.)

T. SHELTON.

APPARATUS FOR SEALING PIPE JOINTS.

No. 413,737. Patented Oct. 29, 1889.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SEALING PIPE-JOINTS.

SPECIFICATION forming part of Letters Patent No. 413,737, dated October 29, 1889.

Application filed June 16, 1887. Serial No. 241,489. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SHELTON, of McKeesport, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Sealing Pipe-Joints; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an apparatus for the sealing of pipe-joints, its object being to prevent the calking material from running through the crevice or crevices of the joint into the interior of the pipe without the use of any permanent packing material. With almost all pipe-joints, and especially in cast-iron pipe, there is between the spigot end and the bowl end a crevice, through which the calking material will run into the interior of the pipe when poured into the calking-recess. In connecting the sections of cast-iron pipes there is always inserted in the rear end of the calking-recess formed between the spigot end and the overlapping bowl some packing material to pack the base of the calking-recess, and thus prevent the calking material, when poured into the recess, from running through the crevice between the ends of the pipe-sections into the interior of the pipes; but this is objectionable, in that it requires a longer bowl on the pipe to give sufficient depth of recess for both the packing and the calking material, and when the material is to be calked to render the joint tight it has to be driven against a yielding backing, and for this reason cannot be spread or calked so perfectly. Where wrought-iron or steel pipes are connected by lead or like joints when no packing is used, there is also more or less difficulty with the calking material running through the crevice between the end of one pipe and the abutting pipe or the pipe and the coupling, and when any deviation takes place in the line, so that the pipe does not rest true within the coupling, the leakage becomes quite troublesome.

To these ends my invention consists in certain improvements and combination of parts, all of which will be more fully hereinafter set forth in the claims.

The invention also consists in an apparatus for closing the crevice or crevices of the pipe-joints, consisting of an expansible ring and means for expanding the same against the crevice of the joint.

And the invention also consists in an expansible ring, two disks, one on each side of the said ring, each carrying a conical frustum on its inner face, a split ring resting on said frusta and between them and the expansible ring, and means for forcing said disks toward and from one another, so as to expand the ring.

And the invention also consists in certain other improvements, all of which will be more fully hereinafter set forth.

To enable others skilled in the art to make and use my invention, I will describe the same, referring to the accompanying drawings, in which—

Figure 1 is a vertical longitudinal section of a pipe-joint with my improved apparatus inserted therein, showing the device contracted. Fig. 2 is a similar view showing the apparatus expanded against the edges and adjacent surfaces of the crevice of the pipe-joint. Fig. 3 is a vertical central section of a pipe of larger diameter, with a modified form of my apparatus shown in position ready to be expanded against the crevice of the joint; and Fig. 4 is a section of Fig. 3 on the line x x, showing the parts expanded.

Like letters refer to like parts in each of the figures of the drawings.

In the ordinary form of cast-iron-pipe joint such as shown in the drawings, when the spigot end a is inserted in the bowl end b, there is always a crevice c leading from the calking-recess d into the interior of the pipe, through which the calking material may run into the interior when it is poured into the calking-recess. With the ordinary sizes of cast and wrought iron pipe, to prevent this running of the calking material into the pipe, I prefer the form of apparatus shown in Figs. 1 and 2. This apparatus consists of two disks e and f, of somewhat smaller diameter than that of the pipe in which it is to be used, the disk e having rigidly attached thereto the rod or shaft g, which passes through an opening in the disk f and through a hollow

rod *h*, rigidly secured to the outer face of the disk *f*, both of said rods being of sufficient length to extend out beyond the pipe-section. The outer end of the rod *g* projects a little beyond that of the rod *h*, and is threaded, as at *i*, and is engaged at this threaded portion by a nut *j*, provided with the projecting arms *j'* and the reduced portion j^2, which portion fits within the hollow rod *h*, and is provided with a groove *k* in its periphery, which is engaged by the set-screw *h'*, carried by the rod *h*, to hold the nut from longitudinal movement; or, in other words, the nut is swiveled to the hollow rod *h*.

On the outer surface of each disk, near their peripheries, are lugs *l*, in which are journaled small guide-rollers *l'*, which project slightly beyond the periphery of disks and serve to support and guide the apparatus while it is being inserted in the pipe, and overcome friction between the apparatus and interior of the pipe. Each disk has on its inner face, and concentric with one another, the conical or inwardly-tapering flanges *e'* and *f'*, on which rests the split ring *m*, preferably of spring metal, and having a diagonal division-line, and being of a width about that of the distance between the two disks when they are drawn to their closest position—that is, when the ring or annular disk *n*, hereinafter described, is expanded to its maximum extent, as shown in Fig. 2. On this ring *m*, and held between the disks *e* and *f*, is the annular expansible ring or disk *n*, of suitable material, which is capable of being expanded so as to increase its diameter and be pressed against the surfaces of the pipe-joint adjacent to the crevice *c*. I prefer to use asbestus or rubber for this ring, as they are non-conductors and will chill the calking material as soon as it comes in contact therewith. The asbestus or rubber is also capable of being made in suitable form to expand readily. By this combination of the split ring and ring of expansible material fitting around and expanded by the split ring I am also enabled to force the expansible ring against the interior of the pipe and form an absolutely tight joint therewith, which could not be accomplished if the outer surface of the sealing apparatus were metal.

When the two ends of the pipe have been fitted together and the joint is to be sealed, the nut *j* is turned so as to force the disk *e* away from the disk *f*. The threads of the nut acting on the threads of the rod *g* thus allows the spring-metal ring *m* to contract, and with it the asbestus ring *n*, as shown in Fig. 1. The apparatus is then thrust into the pipes until it is in position—that is, laps over the adjacent surfaces of the crevice *c* of the joint—suitable guide apparatus being employed to direct the head of the apparatus to the proper position within the pipes. The nut *j* is then turned to draw the disks *e* and *f* together, the tapering flanges *e'* and *f'* thereon thus expanding the split ring *m*, and with it the outer asbestus ring *n*, until the latter is forced against the surfaces of the pipes on each side of the crevice *c* of the joint, as shown in Fig. 2. Molten lead or other calking material is now poured into the calking-recess *d* in the usual manner, and that which runs through the crevice *c* toward the interior of the pipe is retained and chilled by the outer surface of asbestus ring *n* and a smooth surface formed where the lead fills this crevice, so that a uniform and continuous surface is obtained on the interior of the pipe-line at these points instead of annular depressions where the pipes meet, and I thus obtain the well-known advantages of a continuous unbroken interior to the pipe-line, overcoming a large amount of friction in the flow of the fluids, as these depressions necessarily disturb the flow of the fluid and form eddies or cross-currents therein. After the setting of the lead or other calking or filling material the apparatus may be contracted and withdrawn, the disks *e* and *f* being forced apart, thus permitting the contraction of the spring-metal ring *m* and the asbestus ring *n*, as shown in Fig. 1. When the lead is calked to obtain as nearly tight joint as possible, the work is done against a firm backing—to wit, the flange on the spigot end and the inner surface of the bowl—and not, as heretofore, against packing of hemp or other yielding material at the base of the bowl and back of the calking material, and therefore the labor of calking is reduced and a much more perfectly calked joint can be formed. For the same reason the length of the bowl can be reduced, as no space is required for this hemp or like packing. When a large-size pipe-joint is to be sealed—such as the joint of a twenty-inch to thirty-six-inch pipe—I prefer to use the form of apparatus shown in Figs. 3 and 4. In this construction the two disks *e* and *f* are rigidly attached to each other at a suitable distance apart, and swiveled or journaled in the disk *e* is the inner rod *g*, which projects through an opening in the disk *f*, and also through the hollow rod *h*, and carries keyed to its outer end the hand-wheel *p*. The hollow rod *h* has a similar hand-wheel *o* secured to it, and it is rigidly attached to the disk *f*, as in the other form of the device heretofore described. The shaft or rod *g* carries between the disks *e* and *f* the tappet-cam *q*, which acts on the ends of rods or bars *r*, sliding in suitable guides *s*, attached to the disks, these rods having on their outer ends or attached thereto the segments *r'*, on which rests the split ring *m*, heretofore described, and outside of this ring is the expanding asbestus ring *n*. To insure the return of segment-arms *r* to their normal position, a coiled spring *s'* is placed around each rod, one end of the spring bearing against the upper guide *s* and the other against a collar *t*, attached to the rods *r* between the guides *s*. In this case, as the pipes are sufficiently large to allow a boy or man to enter within them, the

rods *h* and *g* need not be very long, as there is no necessity for them to project beyond the end of the pipe to operate the apparatus. When this joint is to be sealed, the boy or man crawls into the pipe, pushing the device ahead of him, and when the device is in proper position he holds by one hand on the hand-wheel *o* the device in position, while with the other he turns the hand-wheel on the rod *g*, which causes the cam *q* on the shaft to act on each one of the rods *r*, forcing them outward and expanding the ring *n* against the contiguous surfaces of the crevice of the joint. The joint is now ready for the calking material to be poured in the recess, as heretofore described. When the operation has been completed, by turning the hand-wheel *p* a little farther, the cam *q* allows the rods to be forced backward by their springs until the ring *n* is contracted sufficiently to be out of contact with the inner surface of the pipe, and thus the device can be readily withdrawn.

This method of calking pipe-joints has the advantage that all liability of the calking material running into the interior pipe is avoided without the use of any permanent packing material, and hence a much tighter joint is obtained. At the same time the crevice of the joint is filled and a smooth surface formed on the interior of the pipe. The reduction in the length of the bowl or bell on the pipe is also an advantage incident to this method, as well as the quickness with which the joints can be sealed.

Having now described my invention, what I claim is—

1. In apparatus for closing the crevice of a pipe-joint during the pouring of the calking material, the combination of a ring of expansible material, a split ring within the expansible ring, two conical frusta fitting within said ring, and means for forcing said cones toward and from one another to expand said split ring, and with it said expansible ring, against the inner surface of the joint, substantially as and for the purposes set forth.

2. In apparatus for closing the crevice of a pipe-joint during the pouring of the calking material, the combination of the ring *n*, of expansible material, the disks *e* and *f*, having the conical frusta or cones thereon, and the split ring *m* between said frusta and the expansible ring, substantially as and for the purposes set forth.

3. In apparatus for closing the crevice of pipe-joints during the pouring of the calking material, the combination of the ring *n*, of expansible material, the two disks *e* and *f*, the inner shaft *g*, and the supporting outer hollow shaft *h*, its outer end forming a journal or bearing for the inner shaft, substantially as and for the purposes set forth.

In testimony whereof I, the said THOMAS SHELTON, have hereunto set my hand.

THOS. SHELTON.

Witnesses:
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