No. 633,537. Patented Sept. 19, 1899.

S. M. STEWART.

LEAK STOPPER.

(Application filed Jan. 18, 1899.)

(No Model.)

Fig. 1.

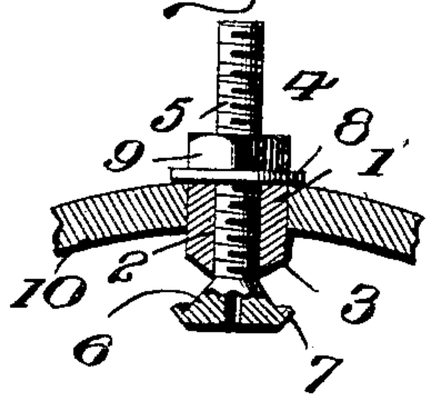


Fig. 2.

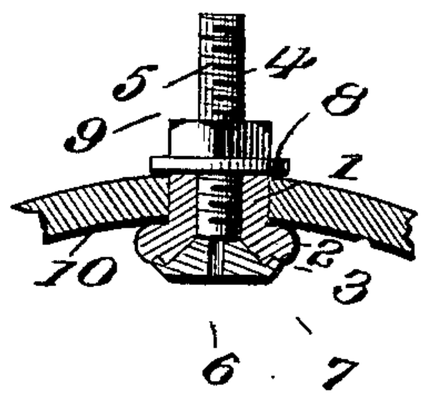


Fig. 3.

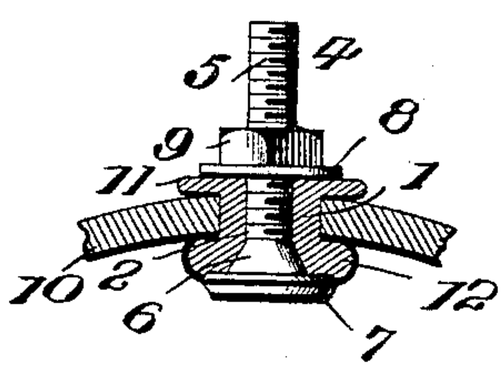


Fig. 7.

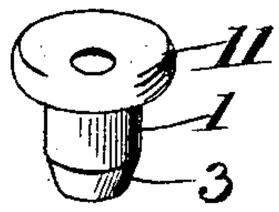


Fig. 4.

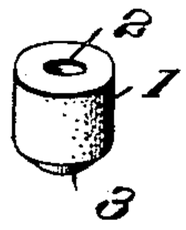


Fig. 5.

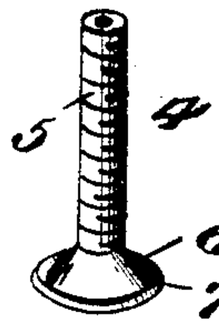


Fig. 8.

Fig. 6

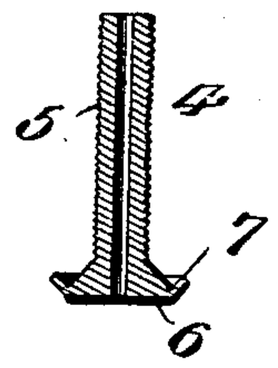
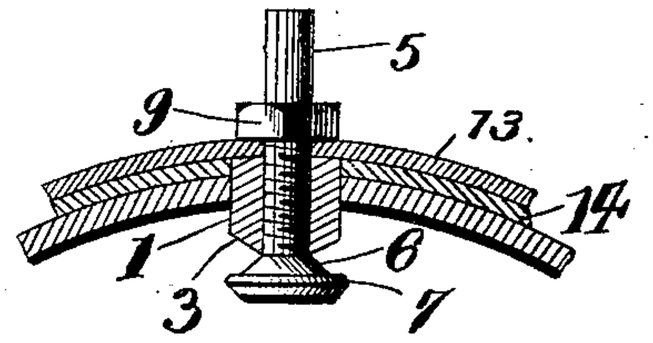


Fig. 9.



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UNITED STATES PATENT OFFICE.

SAMUEL M. STEWART, OF ESCONDIDO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO ROUDOLPHUS PEET, OF SAN DIEGO COUNTY, CALIFORNIA.

LEAK-STOPPER.

SPECIFICATION forming part of Letters Patent No. 633,537, dated September 19, 1899.

Application filed January 18, 1899. Serial No. 702,584. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL M. STEWART, a citizen of the United States, residing at Escondido, in the county of San Diego and State of California, have invented certain new and useful Improvements in Leak-Stoppers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to leak-stoppers; and the purpose of the same is to provide means for quickly closing leaks in watermains, pipes, boilers, or other devices to which the stopper may be applicable and effectually cover the puncture or leak-opening, without unnecessary delay, in a simple and durable manner.

The present form of stopper has many superior advantages over similar devices heretofore used, and particularly its retention in the original desired position in which it is placed and the convenience arising from substituting a hollow or tubular securing-bolt, adapting it for use as a tap through which water, steam, or other motive material may be fed for operating small mechanisms.

The invention consists of the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of the improved leak-stopper and a part of the device to which it is applied, showing the arrangement before compression has been instituted thereby. Fig. 2 is a similar view of the same parts, showing the head of the bolt brought up firmly against the inner end of the plug. Fig. 3 is a similar view showing the form of plug illustrated by Fig. 7 after the plug has been compressed and as it appears in the completed operation, the plug being completely headed on each side of the wall of the leak-opening. Fig. 4 is a detail perspective view of the plug as shown in Figs. 1 and 2. Fig. 5 is a detail perspective view of the bolt when used as a tap. Fig. 6 is a transverse vertical section of the bolt illustrated by Fig. 5. Fig. 7 is a detail perspective view of a washer having a head-flange and as shown applied in Fig. 3. Fig. 8 is a detail perspective view of a solid bolt. Fig. 9 is a sectional elevation of the device, showing the washer used as a patch.

Referring to the drawings, wherein similar numerals are utilized to indicate corresponding parts in the several views, the numeral 1, Figs. 1, 2, 4, and 9, designates a plug of ductile material and having a central bore or opening 2 therethrough and preferably an inner beveled end 3. As shown by Figs. 3 and 7, it has an outer end 11. For use with this plug a bolt 4 is provided having a screw-threaded exterior surface 5 and a flat or conical head 6 and preferably a head combining the desirable features of each in that it contains the compressing power of the flat and the expanding power of the conical and formed with a circumferential flange 7, which connects with the said head at its greatest diametrical extent and inclines outwardly from the face thereof. For convenience in the operation of the device a washer 8 is preferably employed and fitted over the bolt, and engaging the threads 5 of the latter is a clamping-nut 9. At times, however, the washer 8 may be made in the form of a patch 13 and secured by the use of one or more bolts, with gasket 14 for stopping one or more leaks, as shown by Fig. 9, or may be dispensed with and the nut 9 alone used, and which will be sufficiently large to accomplish the same purpose as the washer, as will be more fully hereinafter set forth.

The leak fracture or opening in part 10, which may represent a portion of a water main, pipe, boiler, or other device, is reamed or cut out by a suitable implement or other means to permit the conical head 6 of the bolt to be inserted therethrough and receive either form of plug. The said plug will be made in different sizes, and the proportions of the screw-bolt will also be varied to compensate for variations in dimensions of openings. The plug, however, will preferably have a diametrical extent corresponding to a predetermined size of opening, and when in place in said opening will closely fit the same, as clearly shown in Figs. 1 and 9. At this time also the lower conical end 3 of the plug will be adjacent the beginning-point of the swell of the head 6, and the washer 8, if used, is placed over said

bolt and rests on the exterior of the device having the leak-opening therein and against the outer end of the plug. The nut 9 is then turned on the threads 5 of the bolt, and the head 6 of the latter is gradually drawn against the inner conical end of the plug. By turning the nut 9 gradually it compresses and expands the inner end of the plug, as at 12, Fig. 3, and a secure binding of the inner, outer, and center portions of the said plug is attained, and a leak-proof closure results. As the conical head 6 of the bolt is drawn against the inner end of the plug the flange 7 embeds itself gradually and becomes firmly seated, when the parts are in position shown by Fig. 2, thereby preventing any lateral play or tendency to displacement and also more thoroughly effecting the sealing of the stopper and obviating a leak at the point where the bolt passes through the plug.

The operation of the nut 9 on the outer end of the plug when the washer is dispensed with is precisely similar to the action of said washer as just described, and the advantage in using a conical head-bolt is that a tight reliable joint is formed, which could not be readily secured if the part of the bolt-head coming against the plug were straight.

The flange 7 constitutes a stop-shoulder at the base of the conical head 6 and engages with the conical end 3 of the plug 1 and limits its outward or longitudinal movement relative to the bolt and insures the lateral expansion of the plug when giving the final turns to the nut 9, as clearly indicated in Figs. 2 and 3. The synclinal trough formed at the base of the conical head 6 by the inwardly and outwardly inclined flange 7 receives the arris of the plug 1, as shown in Fig. 2, thereby preventing further longitudinal movement of the plug in the continued rotation of the nut and compelling a lateral displacement of the inner terminal of the plug 1, which is essential to the success and efficiency of the invention.

As shown in Figs. 5 and 6, the bolt is tubular or formed with a bore extending from end to end and which is the form of all bolts used when a tap is wanted for any purpose, as hydrants, water-wheels, or other motors. Said bolt when so used may be provided with proper cut-off for the purpose of controlling or stopping said water, steam, or other substance.

Under ordinary conditions the solid bolt shown by Fig. 8 is used. The flanged plug shown by Figs. 3 and 7 adds materially to the effective sealing of the leak-opening and in many instances will be used instead of the other plug.

For various applications the dimensions and proportions of all parts of the stopper can be changed without departing from the nature or spirit of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed as new is—

1. In a leak-stopper, a bolt having a conical expanding head, the sides of which have a rapid or quick slope, and an inwardly and outwardly flaring restraining-flange at the base of the conical head, a ductile plug slipped upon the bolt and having its inner end made conical, the slope being approximately conformable to the flare or inclination of the said restraining-flange, and a clamp-nut for forcibly moving the conical end of the ductile plug over the conical expanding head of the bolt and against the restraining-flange, substantially as and for the purpose set forth.

2. In a device of the character set forth, a tubular bolt having a conical expanding head, the sides of which have a rapid or quick slope, and an inwardly and outwardly flaring restraining-flange at the base of the conical head, a cylindrical plug of ductile material slipped upon the bolt and having its inner end made conical, the slope being approximately conformable to the flare or inclination of the restraining-flange, and a clamp-nut for forcibly moving the conical end of the ductile plug over the conical expanding head of the tubular bolt and against the restraining-flange thereof, as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL M. STEWART. [L. S.]

Witnesses:
LORENZO SLOCUM,
F. P. WILLARD.