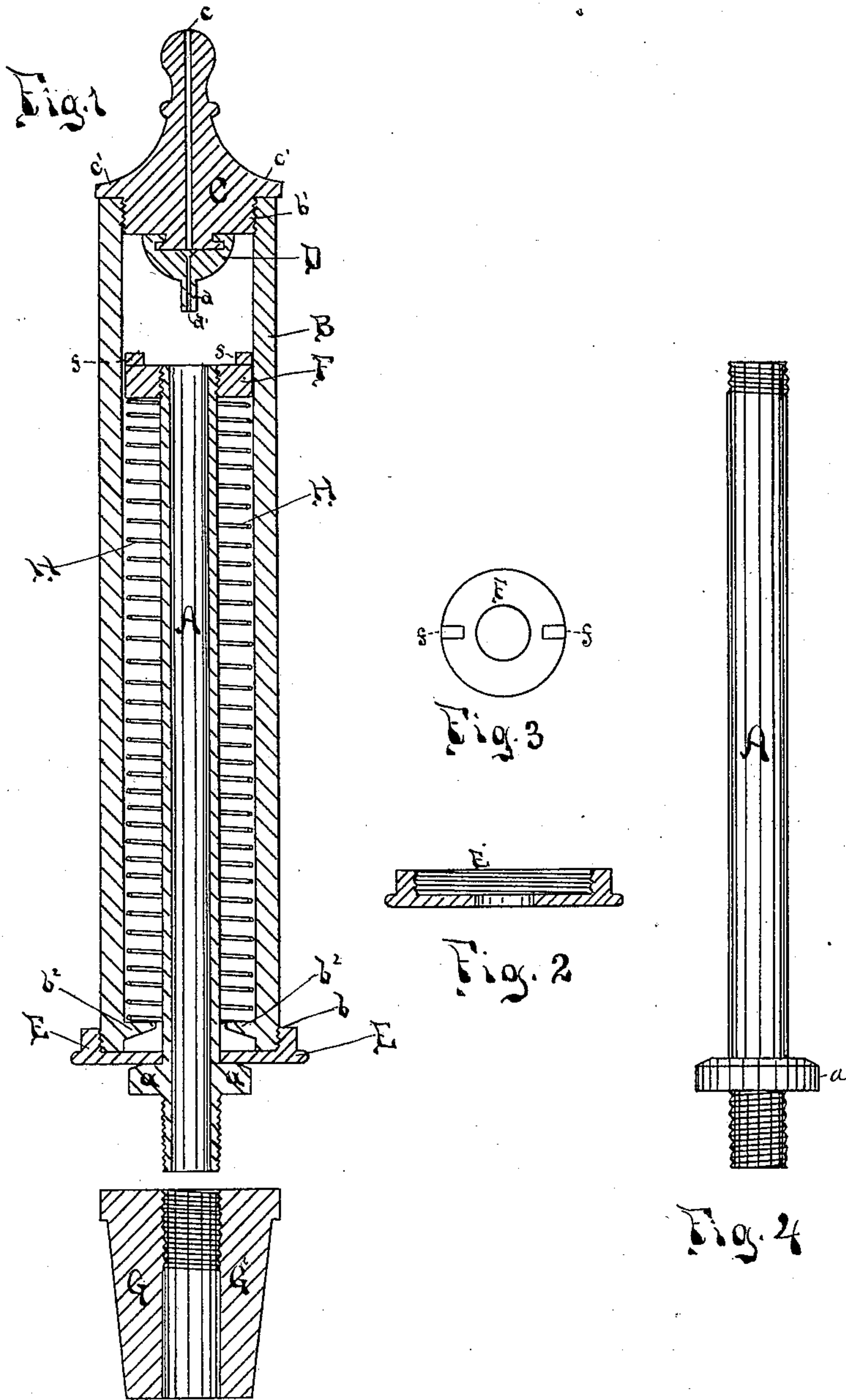


(No Model.)

A. HATTERSLEY.
SAFETY CUSHION FOR WATER PIPES.

No. 404,969.

Patented June 11, 1889.



WITNESSES:

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ALFRED HATTERSLEY, OF FORT WAYNE, INDIANA.

SAFETY-CUSHION FOR WATER-PIPES.

SPECIFICATION forming part of Letters Patent No. 404,969, dated June 11, 1889.

Application filed February 9, 1887. Serial No. 226,999. (No model.)

To all whom it may concern:

Be it known that I, ALFRED HATTERSLEY, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Safety-Cushions for Water-Pipes; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in safety-cushions for water-pipes to protect them from the injurious action of sudden pressures of water caused by turning off open cocks, commonly known as "water-poundings" or "water-hammer;" and also to the combination therewith of an automatic air-vent to afford facilities in the same apparatus to permit the water to pass freely out of the pipes when desired. I attain these objects by the mechanism illustrated in the accompanying drawings, and hereinafter described.

Figure 1 is a vertical section of the entire apparatus. Fig. 2 is a vertical cross-section of the lower cap of the chamber B. Fig. 3 is a top view of the spring-rest and guide-plate; and Fig. 4 is a plan view of the inlet-tube.

Similar letters refer to similar parts throughout the several views.

The chamber B is made proportionally larger than the tube A to provide room for the helical spring H, and to give increased force to the action of the water within the chamber, so that the action of the apparatus shall be prompt and delicate. This chamber is provided with removable caps C and E, fitted on either end with water-tight connections, as shown. Between the cap E and the chamber B is placed a flat rubber or other packing, which fits closely around the tube A, making a water-tight connection. This chamber B is also provided with a circular lug b^2 on its inner periphery at the lower end, as shown, to afford a rest for the helical spring H, and to keep it off of the packing of the tube A just described.

The tube A is provided with a nut a to aid in attaching it to the water-pipes. This tube has also a male screw on the top end, to which

is attached the plate F, which has a corresponding female screw for that purpose, as shown in the drawings, Figs. 1 and 3. This plate F is made to fit loosely in the chamber B, and has two functions—one as a fixed plate against which the spring H rests, and the other as a guide to the chamber B to keep it in relative position when moved by the action of the water. It is essential that it fit in the chamber B loosely enough to permit the water to pass it in either direction freely, otherwise it would impede the action of the spring H. I do not therefore confine myself to the particular form of the plate F, as shown, for it is obvious that a plate with holes through it, or with grooves cut out of its periphery, would answer the same purpose, viz., as a spring-rest and guide-plate permitting water to pass it freely. The helical spring H is placed over and around the tube A, and within the chamber B, as shown in Fig. 1. One end rests against the circular lug b^2 of the chamber B, and the other end of the spring rests against the spring-rest and guide-plate F, its tension tending to keep the rests and the parts to which they are attached apart and in their normal position, as shown in Fig. 1. The tail-piece G is an attachment for lead pipe, to the upper end of which the apparatus is screwed, the lower end being "wiped" on the lead pipe in the usual manner. In iron pipes the apparatus is attached directly.

The cap C is provided with a vent-hole c , extending through it and terminating in or closed by an automatic air-vent D, attached thereto. In the drawings the air-vent D is a rubber valve; but I do not confine myself to the use of the particular valve shown, as it is obvious that any other suitable automatic air-vent attached to the vent-hole c will perform the same function.

The operation is as follows: The apparatus being suitably connected with the water-pipes, the water is turned on and flows into the chamber B through the tube A. The tension of the helical spring is sufficient to resist the normal pressure of the water and hold the parts in place, as shown in Fig. 1. On the occurrence of any pressure in excess of this the chamber B gives way, moving upward on the tube A until the increased tension of the spring equals such increased pressure. On

the subsidence of such excess of pressure the chamber returns to its normal position. This action is very prompt and delicate, as above stated.

5 When it is desired to draw the water entirely out of the pipes, it is turned off in the usual manner at the stop and waste cock, and air is admitted to the pipes through the vent-hole *c* and automatic air-vent *D*, thus permit-
10 ting a free discharge and obviating the necessity of opening any of the upper cocks for that purpose.

I am aware that prior to my invention helical springs have been used to counteract
15 sudden pressures in water-pipes. In one kind of apparatus the spring is made to act against a piston-head in a cylindrical chamber in which it is packed. In another kind two cyl-
20 inders telescope each other with water-tight packing between them, the spring being contained in the interior. In this latter kind of apparatus it is essential that no water be permitted to seep into the space occupied by the
25 spring, for it would retard its action; and if the space were filled with water no action of the spring would be possible.

I do not therefore claim, broadly, the use of a helical spring for such purpose; but

What I do claim, and desire to secure by Letters Patent, is—

1. In a safety-cushion for water-pipes, the combination of a movable chamber *B*, having caps *C* and *E*, with a fixed inlet-tube *A* passing through cap *E*, and having a spring-rest and guide-plate *F*, constructed to permit the
35 water to pass it freely, secured to its inner end, and a spring arranged between said guide-plate and the cap *E*, substantially as described.

2. In a safety-cushion for water-pipes, the combination, with a fixed and movable portion, one of them constituting a chamber, of a spring interposed between them, one of them
40 constituting a water-receiving chamber, a cap *C* on said chamber provided with a vent-hole
45 *c*, and an inwardly-opening valve covering said vent-hole, substantially as described.

In testimony whereof I do hereto subscribe my name, in the presence of two witnesses, this 5th day of February, A. D. 1887.

ALFRED HATTERSLEY.

Witnesses:

ALFRED ILLION HATTERSLEY,
H. C. HARTMAN.