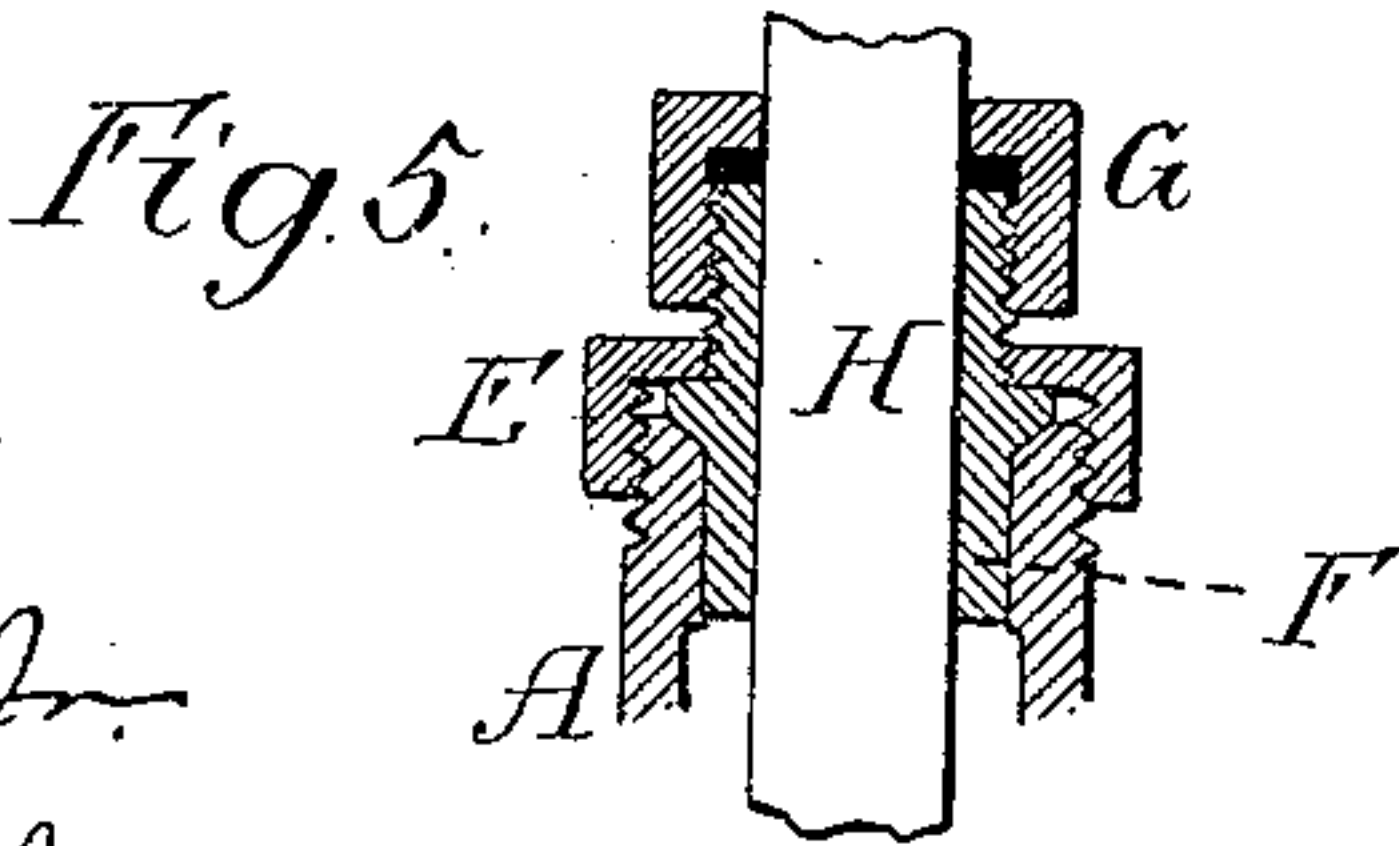
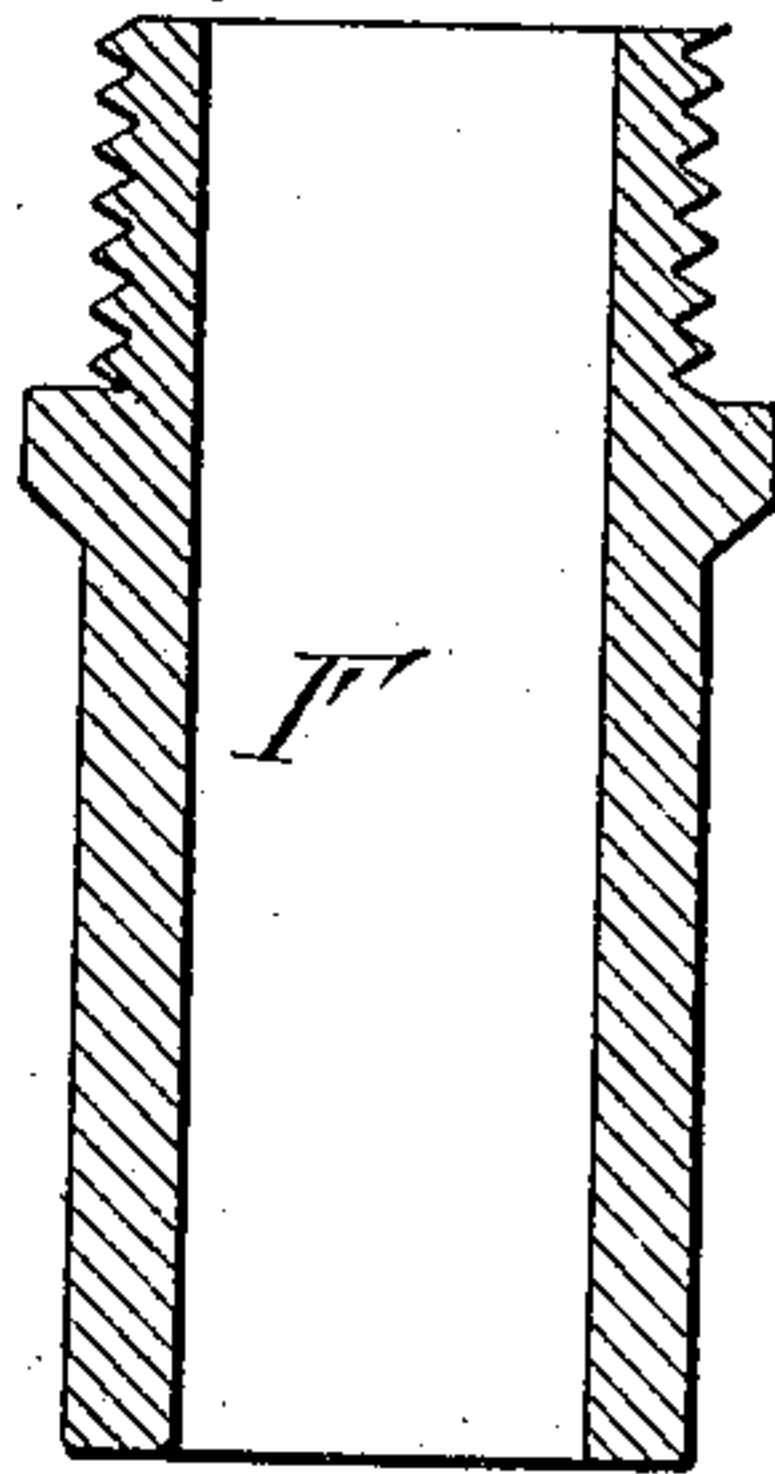
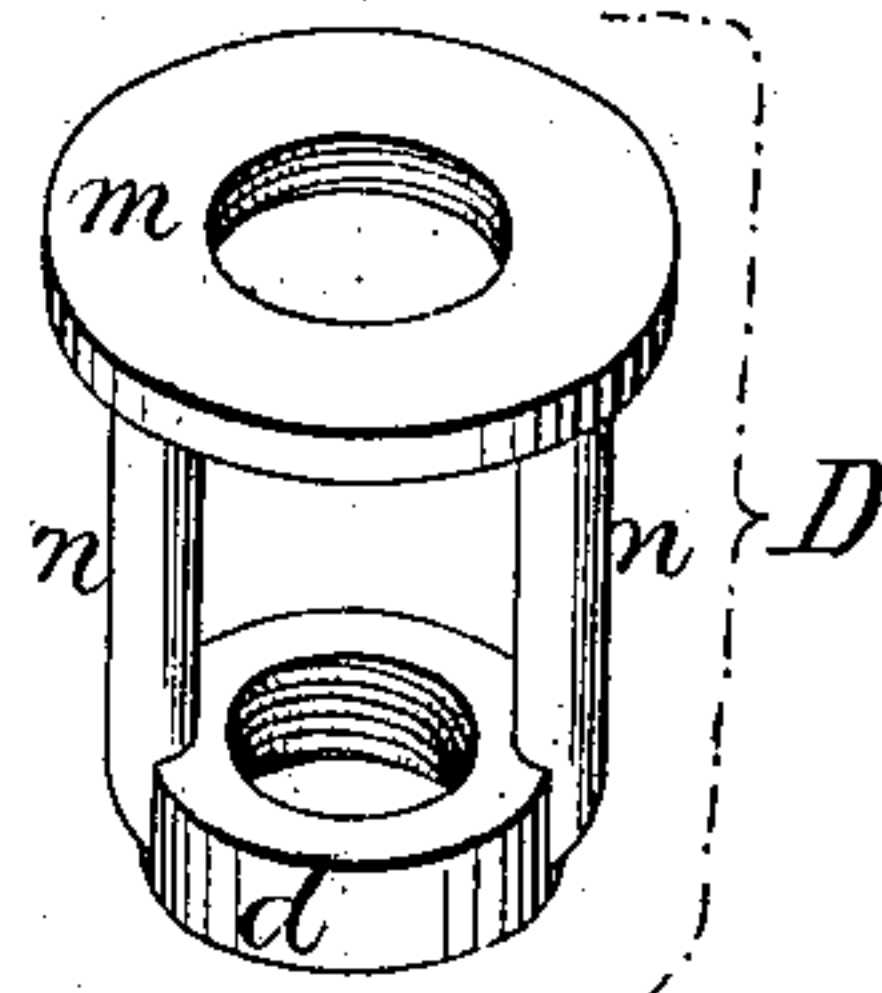
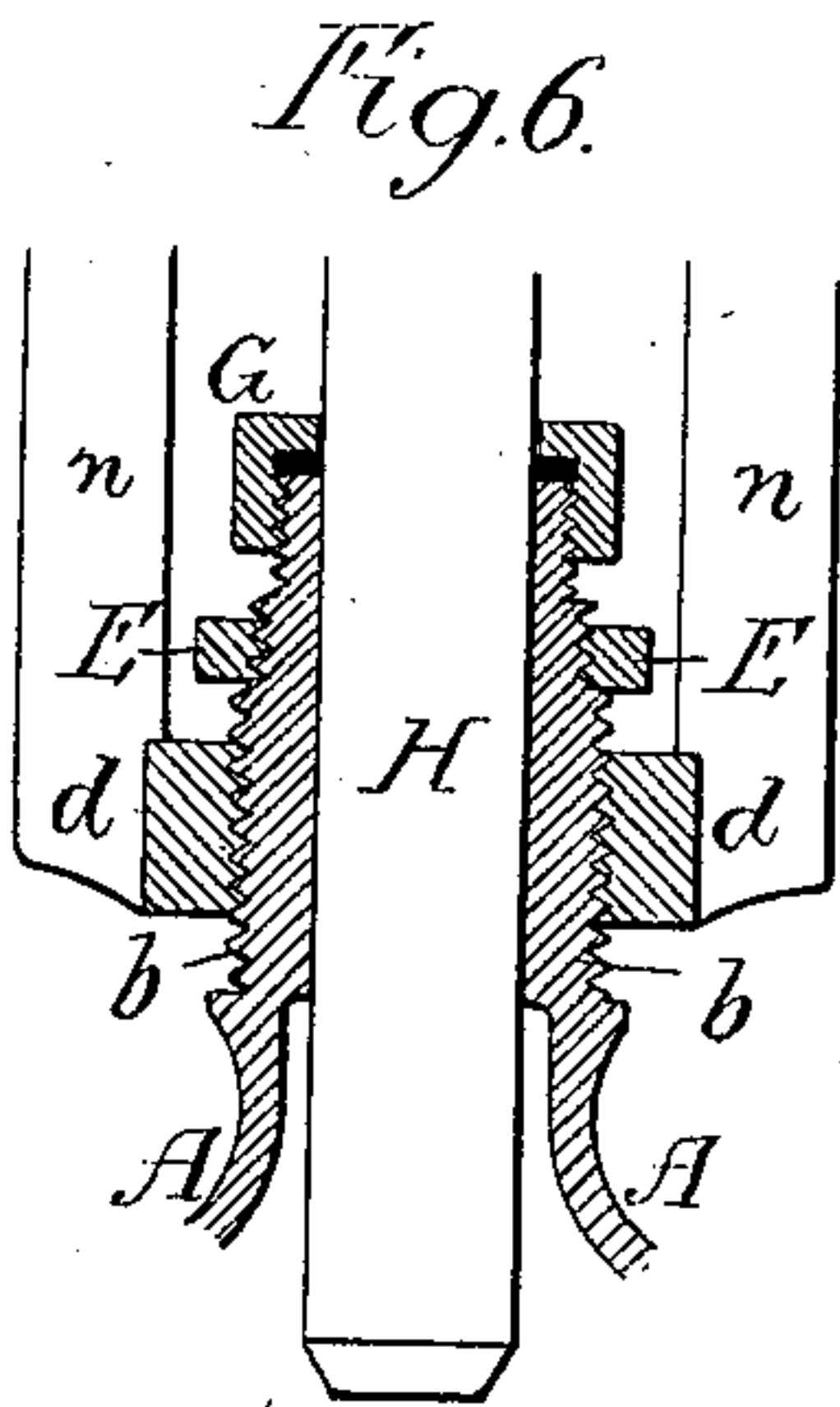
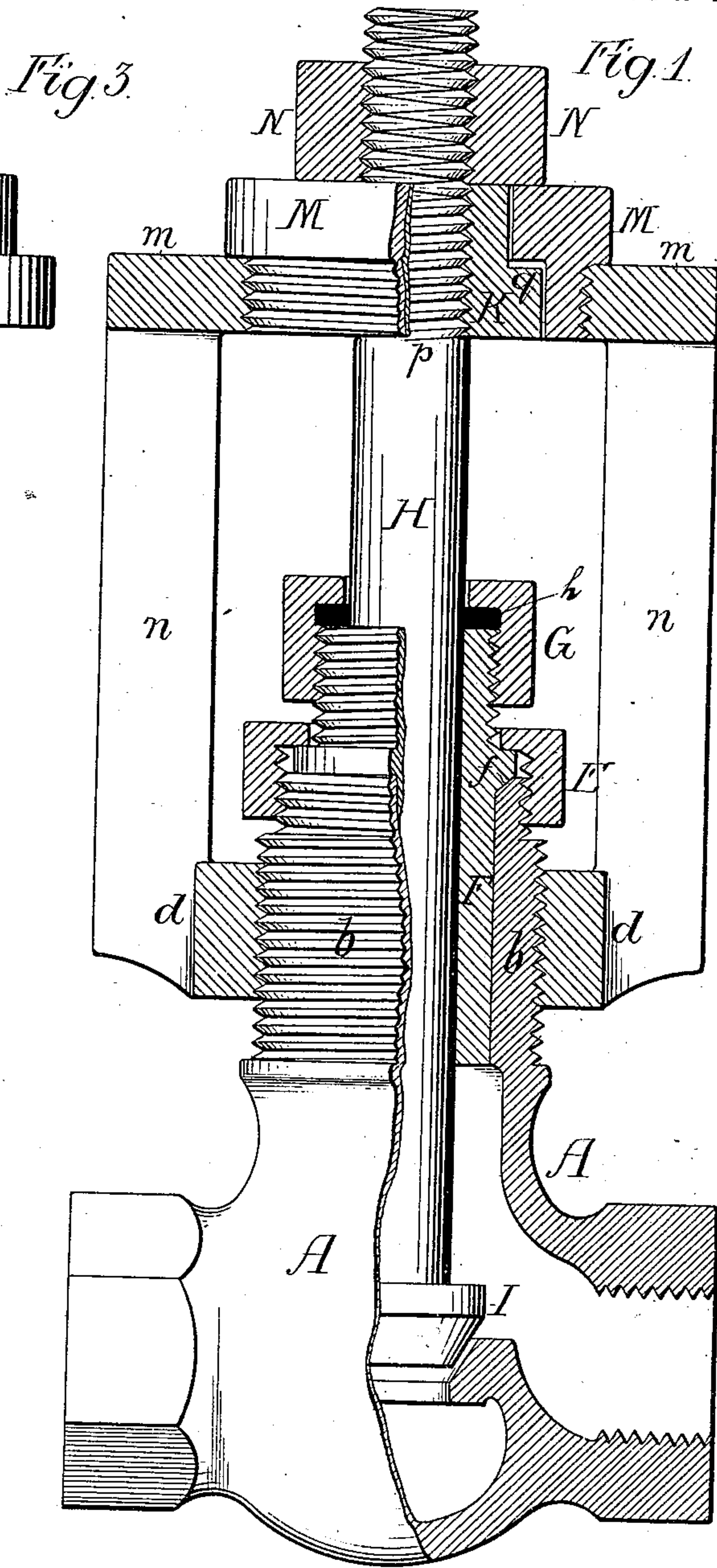
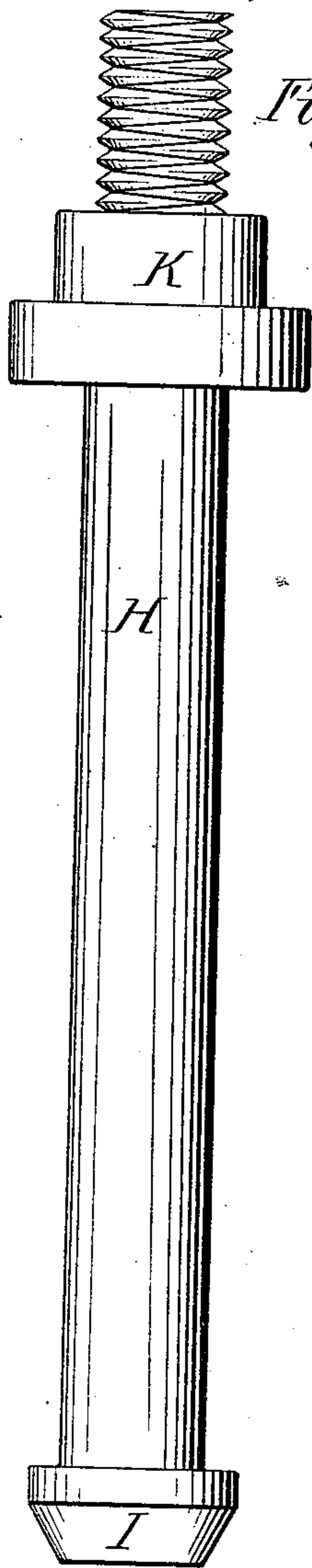


G. H. PERKINS, W. S. & E. B. CLARK.  
Stop-Valve.

**No. 226,544.**

**Patented April 13, 1880.**



Witnesses  
Henry Howson Jr.  
Harry Smith

Inventors  
George H. Perkins  
William S. Clark  
and  
Edward B. Clark  
by their Attorneys  
Howson and Son



# UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, WILLIAM S. CLARK, AND EDWARD B. CLARK, OF  
PHILADELPHIA, PENNSYLVANIA.

## STOP-VALVE.

SPECIFICATION forming part of Letters Patent No. 226,544, dated April 13, 1880.

Application filed December 29, 1879.

*To all whom it may concern:*

Be it known that we, GEORGE H. PERKINS, WILLIAM S. CLARK, and EDWARD B. CLARK, all of Philadelphia, Pennsylvania, have invented new and useful Improvements in Stop-Valves, of which the following is a specification.

Our invention relates to improvements in stop-valves for regulating the flow of fluids generally, and especially of volatile liquids, such as benzine and other products of the distillation of petroleum, our improvements being mainly directed to the tight closing of that branch of the valve-chest through which the valve has to be introduced to its seat; to the operating of the valve without turning the valve or valve-stem; to provide for the re-grinding of the valve or valve-seat without the necessity of using the ordinary devices for this purpose, and to the construction of the several parts in such a manner that, while they can be readily disconnected when necessary, they cannot become loosened during the act of operating the valve.

The details of our invention for effecting these objects are too fully explained herein-after to need preliminary description.

In the accompanying drawings, Figure 1 is a view, partly in section and partly in elevation, of our improved valve; Fig. 2, a perspective view, drawn to a reduced scale, of the handle by the manipulating of which the valve-spindle and valve can be raised and lowered; Fig. 3, a detached view of the valve, valve-spindle, and its collar; Fig. 4, a detached view of the sleeve referred to hereinafter; and Figs. 5 and 6, sectional diagrams, illustrating modifications of our invention.

Referring to Figs. 1, 2, 3, and 4, A is an ordinary valve-chest, having branches *a a*, which may be threaded internally or externally or flanged for attachment to the ends of pipes. On the vertical branch *b* of the chest is cut an external right-handed thread, adapted to the internally-threaded nut *d*, which forms the lower portion of the handle D, the peculiar construction of the latter being explained hereinafter. A portion of the branch *b* at the upper end of the same is reduced in diameter externally, and on this portion is cut a left-handed

thread adapted to a nut, E, an internal flange on which bears upon a collar, *f*, on the sleeve F, the latter fitting snugly in the branch *b* of the chest.

A perfectly tight joint is made between the under side of the collar *f* of the sleeve and the top of the branch, the latter and the collar being preferably beveled, as shown, so as to facilitate the formation of a ground joint, the tightness of which will always be assured as long as the nut E is screwed down hard on the said collar.

An ordinary right-handed thread is cut on the upper portion of the sleeve F for receiving the nut G, through which and through the said sleeve passes the spindle H of the valve I, which is made in one piece with or permanently secured to the spindle, and which is adapted to the usual seat formed in a partition in the chest. The spindle should fit snugly within, but so as to be readily introduced into or withdrawn from, the sleeve, and suitable packing *h* must intervene between the upper end of the said sleeve and an internally-projecting flange of the nut G.

The handle D, previously alluded to, consists of the nut *d*, the plate or ring *m*, and the bars *n n* for connecting the two together, the whole being preferably made in one piece.

It is not essential to adhere to the precise configuration shown of the handle; but there must be a nut at the bottom connected to a plate, *m*, at the top.

On the upper portion of the valve-spindle is formed a screw-thread, terminating abruptly at a shoulder, *p*, the threaded portion of the said spindle being a trifle smaller in diameter than the plain portion, and a collar, K, is screwed down hard and tight against this shoulder, for this collar must be an essential part of the spindle. This collar K, the upper portion of which is reduced in diameter, fits freely in a ring or nut, M, which is fitted into and secured to the plate *m* of the handle, preferably by screwing it into the said plate, the shoulder *q* of the collar being arranged to bear against the under side of an internal flange of the said ring, the screw-thread of which is left-handed, as shown in Fig. 1.

A nut, N, is screwed onto the upper portion



of the spindle and bears against the collar K. That portion of the screw-thread of the spindle which is adapted to the said nut N is left-handed, while the lower portion, adapted to the collar K, is right-handed.

In order that this duplex thread may be formed economically on the spindle and without any material reduction in the diameter of the upper part of the threaded portion, a right-handed thread is, in the first instance, cut from the collar *p* to the top of the spindle, and then, by means of an appropriate tool, a left-hand thread is cut across the right-hand thread for the nut N.

In order that the upper end of the handle may turn freely on the collar K of the spindle under the circumstances explained hereinafter, there should be a very slight vertical play of the handle, or rather of its ring M, between the shoulder *q* of the collar and the under side of the nut N. The collar, too, should have a loose lateral fit on the ring M.

The object of the arrangement of right-handed and left-handed screw-threads in the different parts referred to may be explained as follows: On screwing down the handle so as to depress the valve-spindle, it is immaterial whether the latter turns with the handle or not, although the packing *h* will generally prevent the latter from turning; but the moment the valve I reaches the seat the friction will be such as to retain the spindle, and hence in giving the handle an extra turn to tighten the valve on its seat the ring M of the handle must press hard on and move in severe frictional contact with the shoulder *q* of the collar K of the spindle. As the hand in manipulating the handle is applied to the rods *n n* of the same, the screwing down of the handle to tighten the valve would have a tendency to unscrew the said ring M, owing to its friction against the collar, if the thread of the nut should be right-handed; hence we make it left-handed, so that the last turning of the handle to press the valve to its seat can only tend to tighten the said ring M to its bearing on the plate *m* of the handle.

In screwing up the handle to loosen the valve from its seat the ring M must be brought into hard frictional contact with the under side of the nut N, and the latter would be loosened if it were adapted to a right-handed thread on the spindle; but, the thread being left-handed, the only effect of the pressure of the ring M against the nut N while the former is being turned must be to tighten the said nut.

When, on screwing up the handle, its nut *d* comes in contact with the nut E on the branch *b* of the valve-chest, the turning of this nut E by the continued turning of the handle is prevented by making the thread of the nut and that on the branch adapted to the nut left-handed, so that any careless attempt to screw up the handle beyond its limits can only result in tightening the nut as well as the ground-joint where the beveled collar *f* on the sleeve

F bears on the beveled seat in the top of the branch *b*. This is an important feature of our invention, for this joint should be tight at all times and under all circumstances.

The loosening of the parts above described may be prevented by means other than the system of right and left handed threads described. For instance, the ring M, instead of being threaded, might be simply fitted into the opening of the plate *m* of the handle, and so secured by set-screws or otherwise as to be detachable from the said plate; but the system of screw-threads is the most simple and economical, and permits the ready detaching of the several parts from each other in the following manner:

The nut E is first unscrewed from the upper end of the branch *b* of the chest, when the handle can be unscrewed and detached from the same branch, carrying with it the spindle and its valve, the sleeve F, and nuts E and G, after which all these parts can be detached from the handle by first detaching the ring M from the plate *m* of the said handle and drawing the spindle, its sleeve and nuts through the opening in the said plate *m*, the said opening being large enough to permit the passage through it of the nut E. The manner in which the parts which still remain in connection with each other can be separated will be readily understood without explanation.

It may be remarked here that a valve has been so constructed that the spindle could be operated by a handle adapted to the threaded exterior of a branch of the chest; but the branch was made in two parts, so that the nut of the handle could be introduced in its place.

One of the main objects of our invention has been to make the threaded branch of the chest solid, so as to prevent all possibility of leakage, for it should be understood that while our improved valve is applicable to any purposes to which ordinary valves are adapted it is more especially intended for regulating the flow of volatile fluids, such as benzine, which will penetrate through badly-fitted joints.

The manner in which we are enabled to obtain a solid branch, *b*, will be understood from the foregoing description.

It is essential that this branch should be large enough internally to permit the free withdrawal of the valve; but, instead of resorting to ordinary unreliable packing for closing the space which intervenes between the spindle and enlarged interior of the branch, we fill this space with the sleeve F, which fits with a reliable ground joint to the top of the branch, and which at the same time forms an efficient guide for the valve-spindle, the only packing required about the valve being that which intervenes between the nut G and top of the sleeve.

In the modification shown in the diagram, Fig. 5, the branch *b* of the chest is not externally threaded for the nut of an operating-handle, but between the interior of the branch



and the spindle intervenes the sleeve F, fitted to the top of the branch with a tight joint—a feature which may be advantageously adopted in the construction of stop-valves generally.

5 In some cases no enlargement of the spindle is required to form the valve, the latter being made by beveling the end of the spindle itself, as shown in Fig. 6. When this plan is adopted there will be no necessity for a sleeve,  
10 F, the spindle fitting snugly and directly in the externally-threaded branch *b* of the chest and the retaining-nut E, handle D, and its detachable ring M being retained.

Owing to the fact that the vertical movement of the valve is effected without turning the valve-spindle, there is no tendency to unscrew the nut G. This is an important feature in that class of valves which are used in connection with pipes for conveying benzine or  
20 other volatile hydrocarbons, as it has been found in practice that one of the most prolific sources of danger in the use of ordinary valves for this purpose is the unscrewing of the nut which confines the packing, thereby allowing  
25 the liquid to escape around the valve-stem.

The spindle and valve being made in one piece or rigidly secured together, and the spindle being a plain rod guided in the sleeve F or in the branch *b* of the chest, the valve  
30 may be ground to its seat without being removed from the chest by simply turning the spindle by means of a suitable hand-tool after first removing the nut N; or, if the use of sand or emery is necessary to effect the proper grinding operation, sufficient of the retaining devices  
35 may be detached to permit the removal of the valve and spindle, when the sand or emery may be applied, the valve and spindle reinserted, and the grinding operation proceeded  
40 with. On the completion of the grinding operation the valve and spindle can be removed, the valve and seat cleaned off, and the parts returned to their former positions.

By this means we dispense with the ordinary  
45 costly valve-grinding devices and insure a perfectly tight fit of the valve and seat, owing to the fact that the grinding is effected directly by the rotary action of the valve on said seat.

We claim as our invention—

50 1. The combination, in a stop-valve, of the valve-spindle H and the branch *b* of the chest with a sleeve, F, having a collar, *f*, fitted to the top of the branch and confined thereto by a nut, all substantially as set forth.

2. The combination, in a stop-valve, of the 55 valve-spindle and externally-threaded branch *b* of the chest with a nut, *d*, adapted to the said branch and forming part of the handle connected to the spindle, and with a stop on the exterior of the branch for preventing the  
60 accidental unscrewing of said nut, all substantially as described.

3. The combination, in a stop-valve, of the valve-spindle, the branch *b* of the chest, having an external screw-thread, and the nut *d*, forming part of the handle, for operating the said  
65 spindle, with the sleeve F and nut E for confining the collar of the sleeve to its seat in the branch, all substantially as set forth.

4. The combination of the branch *b* of the 70 chest, having an external right-handed thread, the nut *d*, adapted thereto and forming part of the operating-handle, the sleeve F, and the nut E, having a left-handed thread adapted to a similar thread on the said branch *b*, all sub-  
75 stantially as specified.

5. The combination of the sleeve F and the nut E for confining said sleeve to the threaded branch *b* of the chest with the handle D, having a nut, *d*, adapted to the branch, and a plate, 80  
*m*, having an opening large enough to permit the passage through it of the said nut E, substantially as and for the purpose described.

6. The combination of the handle D, having a plate, *m*, the valve-spindle having a collar, 85  
K, and the ring M, adapted to the said collar and fitted to an opening in the plate *m* of the handle, so as to be detachable therefrom, as described.

7. The combination of the valve-spindle having a collar, K, with the plate *m* of the handle, 90  
and with the ring M, adapted to the collar, and having a left-handed screw-thread adapted to a similar thread in the said plate, as set forth.

8. The combination of the valve-spindle having a collar, K, the handle D, and ring M, and 95  
a nut, N, having a left-handed thread adapted to a similar thread on the spindle, as set forth.

In testimony whereof we have signed our names to this specification in the presence of 100  
two subscribing witnesses.

GEORGE H. PERKINS.  
WILLIAM S. CLARK.  
EDWARD B. CLARK.

Witnesses:

ALEXANDER PATTERSON,  
HARRY SMITH.