(No Model.)

A. P. SMITH.

TAPPING APPARATUS.

No. 485,716. Patented Nov. 8, 1892.

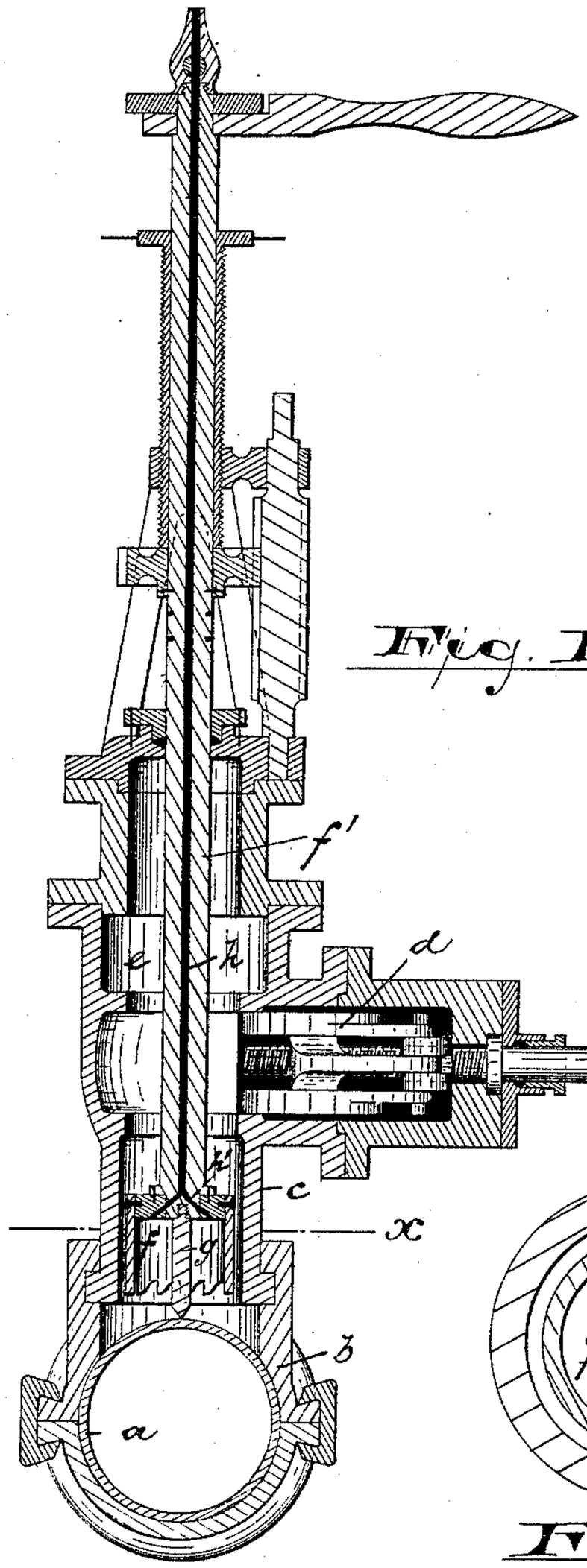

Fig. 1

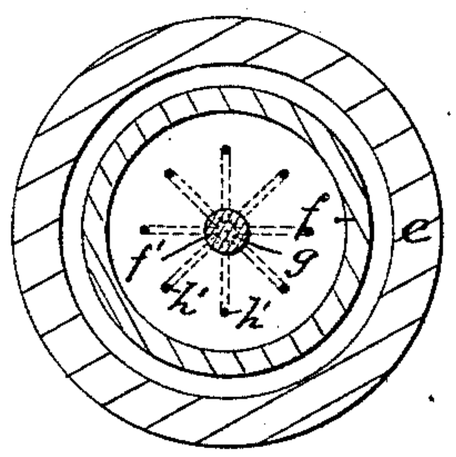

Fig. 2

Witnesses

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UNITED STATES PATENT OFFICE.

ANTHONY P. SMITH, OF NEWARK, NEW JERSEY.

TAPPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 485,716, dated November 8, 1892.

Application filed January 8, 1892. Serial No. 417,359. (No model.)

To all whom it may concern:

Be it known that I, ANTHONY P. SMITH, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Tapping Apparatus; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in that class of tapping apparatus represented by the one shown in my prior patent, No. 419,974, and more particularly to that portion of said apparatus which provides means for preventing the disk or section cut from the main or its connections from falling into said main, where it will tend to clog or obstruct the free flow of fluid.

The object of the invention is to provide other means of securing this important result than I have heretofore provided.

The invention consists in the means employed for directing the cut or severed disk outward from the main or its attachments, substantially as will be hereinafter set forth, and finally embodied in the clauses of the claim.

Referring to the drawings, in which like letters indicate corresponding parts in each of the figures, Figure 1 is a central longitudinal section of the improved tapping apparatus; and Fig. 2 is a transverse section of the same, taken on line *x*.

In said drawings, *a* indicates the main-supply-pipe in which the tap is to be made.

b is a collar adapted to be adjusted upon said main to strengthen and support the same, the said collar being provided with a branch pipe *c*, having a suitable gate *d* for closing the longitudinal passage *e* in said branch pipe after making the tap, and *f* indicates the cutting-tool, annular in shape and having a chamber or recess formed centrally within, into which chamber the disk or section cut from the main enters. Said tool works longitudinally in the passage *e* to and from the main and is carried by the cutter-shaft *f'*. Said shaft is also provided with a drill *g*, which serves as an extension of said shaft and lies at the axial center of the cutting-tool in the chamber therein. It projects forwardly beyond the cutting-edges of said tool, so as to first engage the pipe or main *a* and enter the same. It thus provides a bearing by means of which greater rigidity and strength is secured in cutting the disk or section from the pipe or main. In the prior patent above referred to purely mechanical means were employed to hold the severed disk or section or to provide a "shoulder to hold the piece." In the present case I dispense with a shoulder or catch to hold said piece and allow the water-pressure alone to serve the purpose. To secure this end effectually and well, I provide means for relieving the severed disk from water-pressure behind the same, (or toward the chamber,) so that the water-pressure of the main on the side toward the tapped aperture will be allowed to act to hold the said disk upon the drill or within the annular cutter *f* as said cutter is drawn backward from the main pipe in the chamber *e*.

The means employed for reducing the pressure behind the disk are water-ducts *h h'*, leading from the said annular chamber outward toward and into the outer air. These ducts are formed in any suitable manner to accomplish the result, but are preferably as indicated in the drawings, where *h* indicates a central longitudinal passage formed in the shaft *f'*, and *h'* are smaller passages radiating from the end of the main channel into the annular chamber, as indicated in Fig. 2, so that the water will escape evenly from opposite points in said chamber and reduce the pressure therein uniformly. The outer pressure of the water from the main will thus be allowed to act to force the disk inward or to hold it from becoming disconnected from the drill or cutter. Thus the water of the main or supply pipe serves as the automatic means for holding the disk and prevent it from dropping into the main or from becoming detached from the tapping apparatus. I may employ these means in connection with the mechanical holders above referred to, and thus insure increased safety, so that should the said mechanical means be broken or be-

come inoperative the water-pressure alone will effect the desired result.

The operation of the improvements having been sufficiently described, more particular description here is deemed to be unnecessary.

I am aware that modifications may be made in the devices described without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new is—

1. The combination, with the cutter *f* and drill *g*, of a shaft for operating said cutter and drill, the said shaft being provided with a duct to allow the outflow of liquid, substantially as set forth.

2. The combination, with a cutter having a chamber to receive the severed disk, of a duct leading from said chamber to the open air, whereby the pressure on said disk will be reduced on the side toward said chamber, substantially as set forth.

3. The combination, with the longitudinal shaft of a tapping apparatus having a drill and annular cutter secured at the end thereof, of a duct formed in said shaft and extending from the interior of said annular cutter to the outer air, substantially as set forth.

4. In combination, the main or supply pipe *a*, branch *e*, longitudinally-perforated shaft *f'*, having the annular cutter *f* thereon, and the extension drilling-tool *f*, the perforation in said shaft leading into said annular cutter, as indicated, means for operating the shaft, and a gate *d* for closing the branch, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of December, 1891.

ANTHONY P. SMITH.

Witnesses:
CHARLES H. PELL,
OSCAR A. MICHEL.