

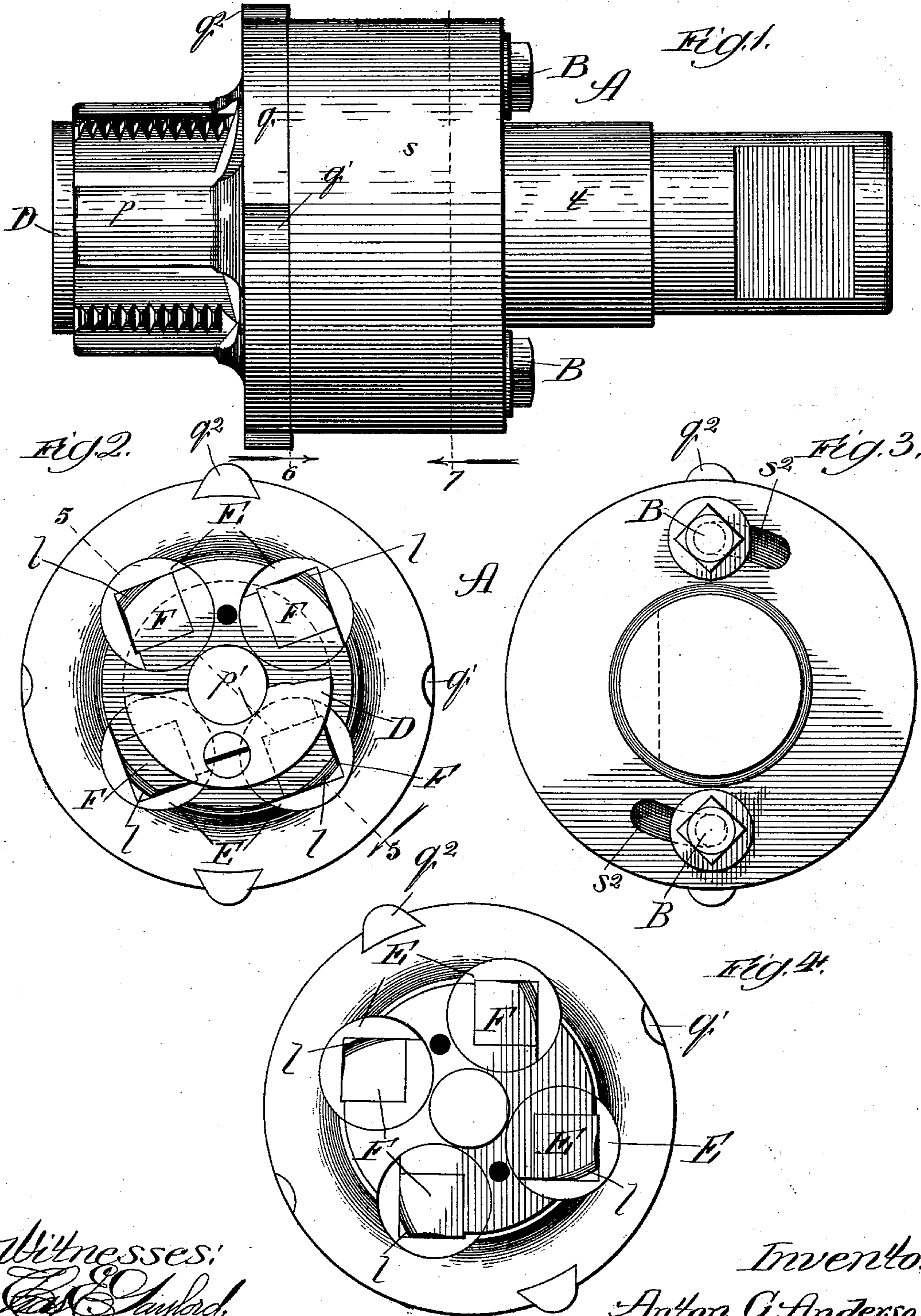
(No Model.)

3 Sheets—Sheet 1.

A. G. ANDERSON.
COLLAPSIBLE TAP.

No. 509,113.

Patented Nov. 21, 1893.



Witnesses:
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(No Model.)

3 Sheets—Sheet 2.

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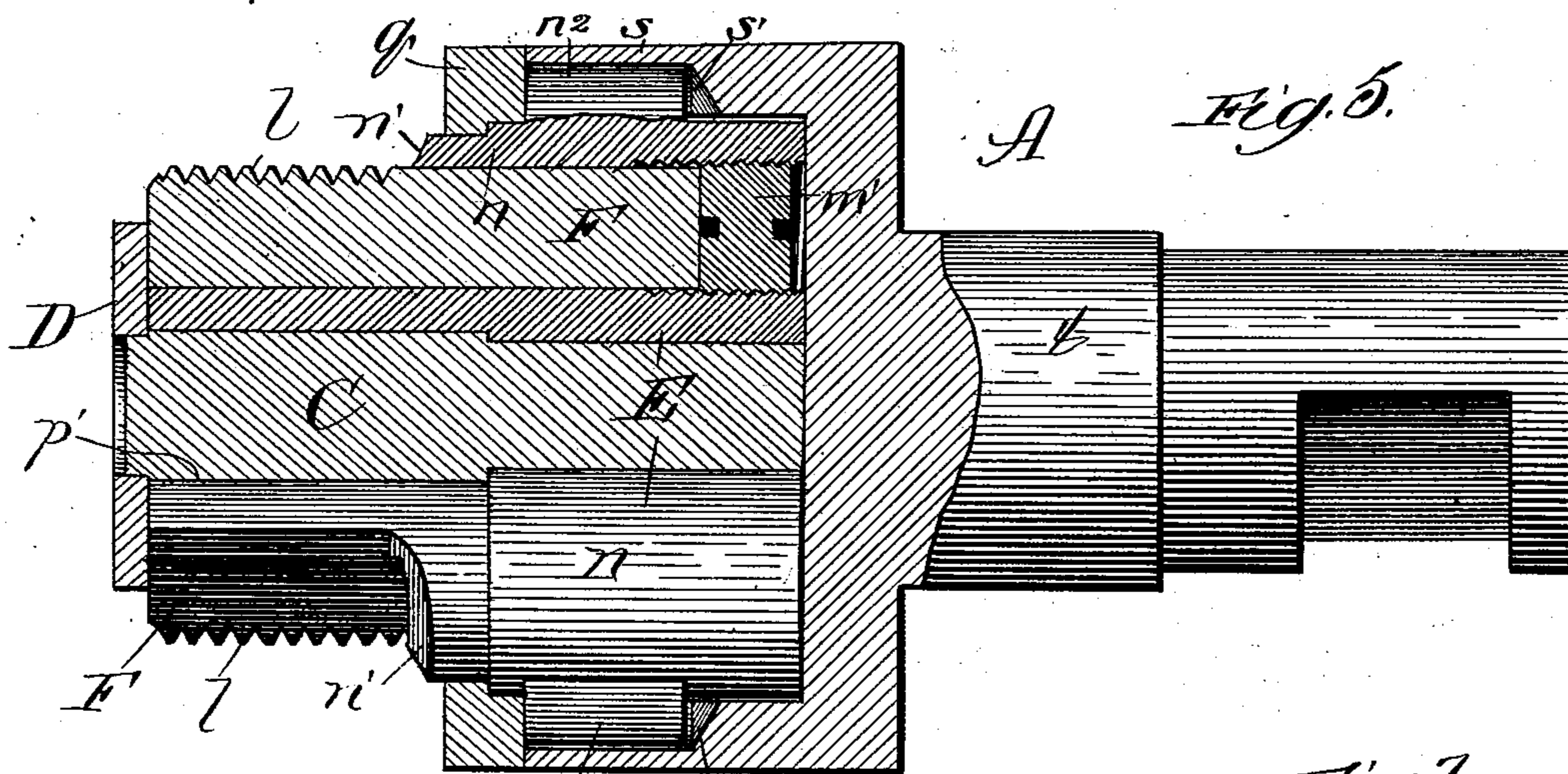


Fig. 6.

Fig. 7.

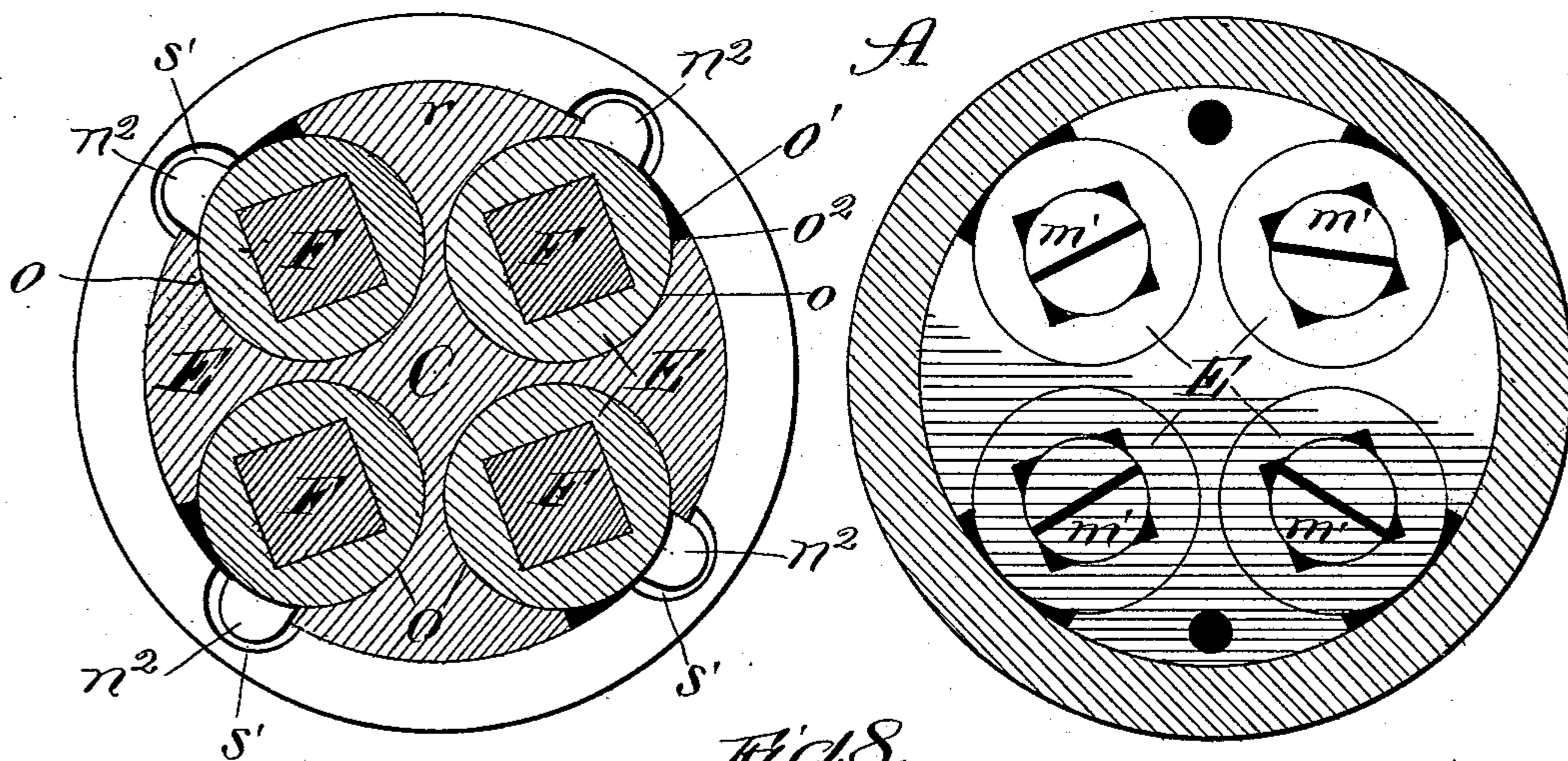


Fig. 8.

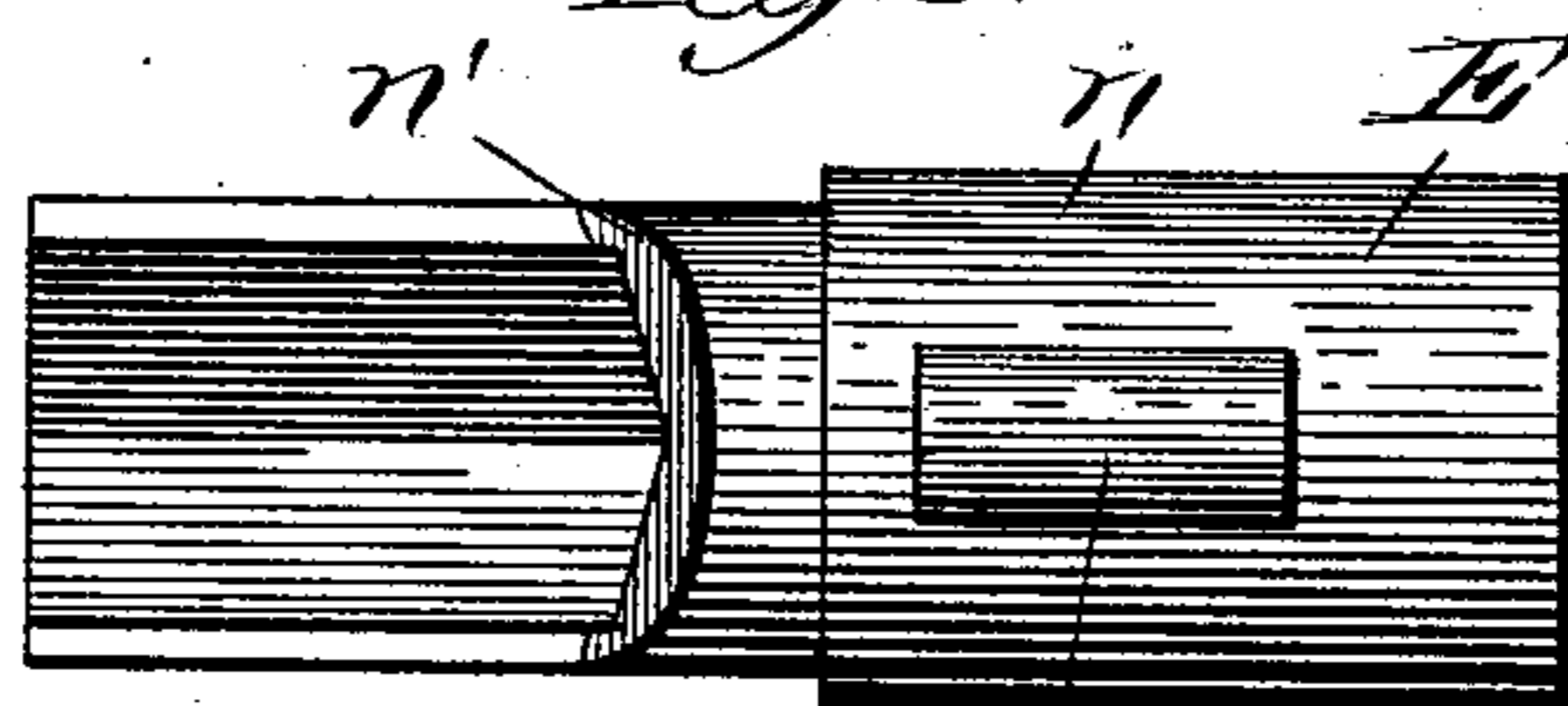
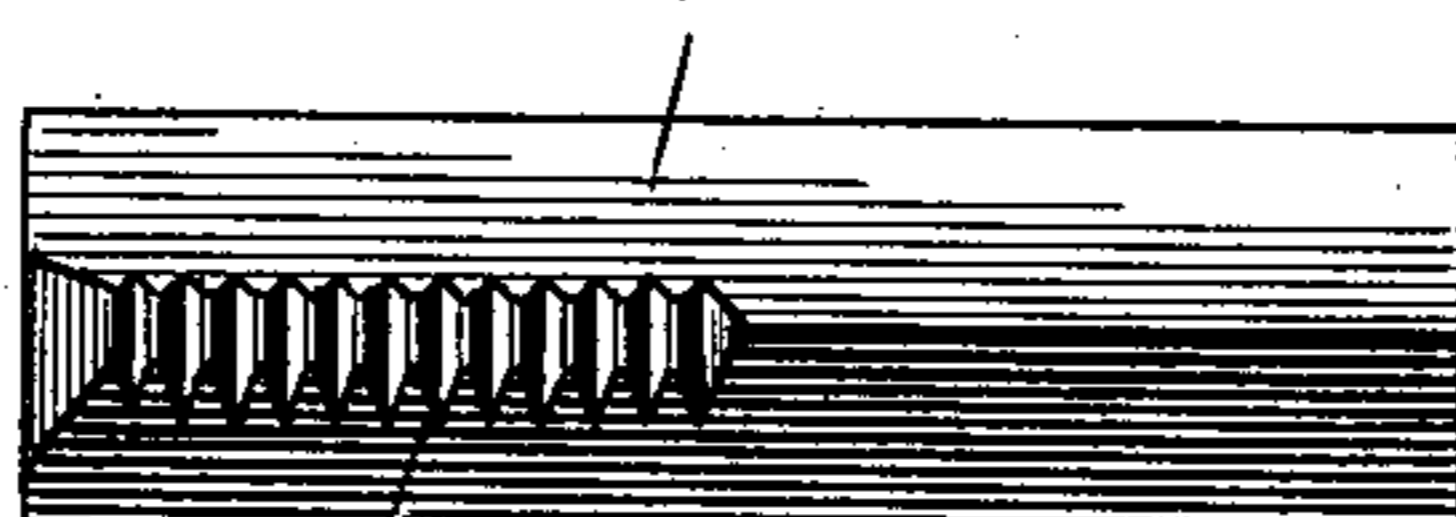


Fig. 9.



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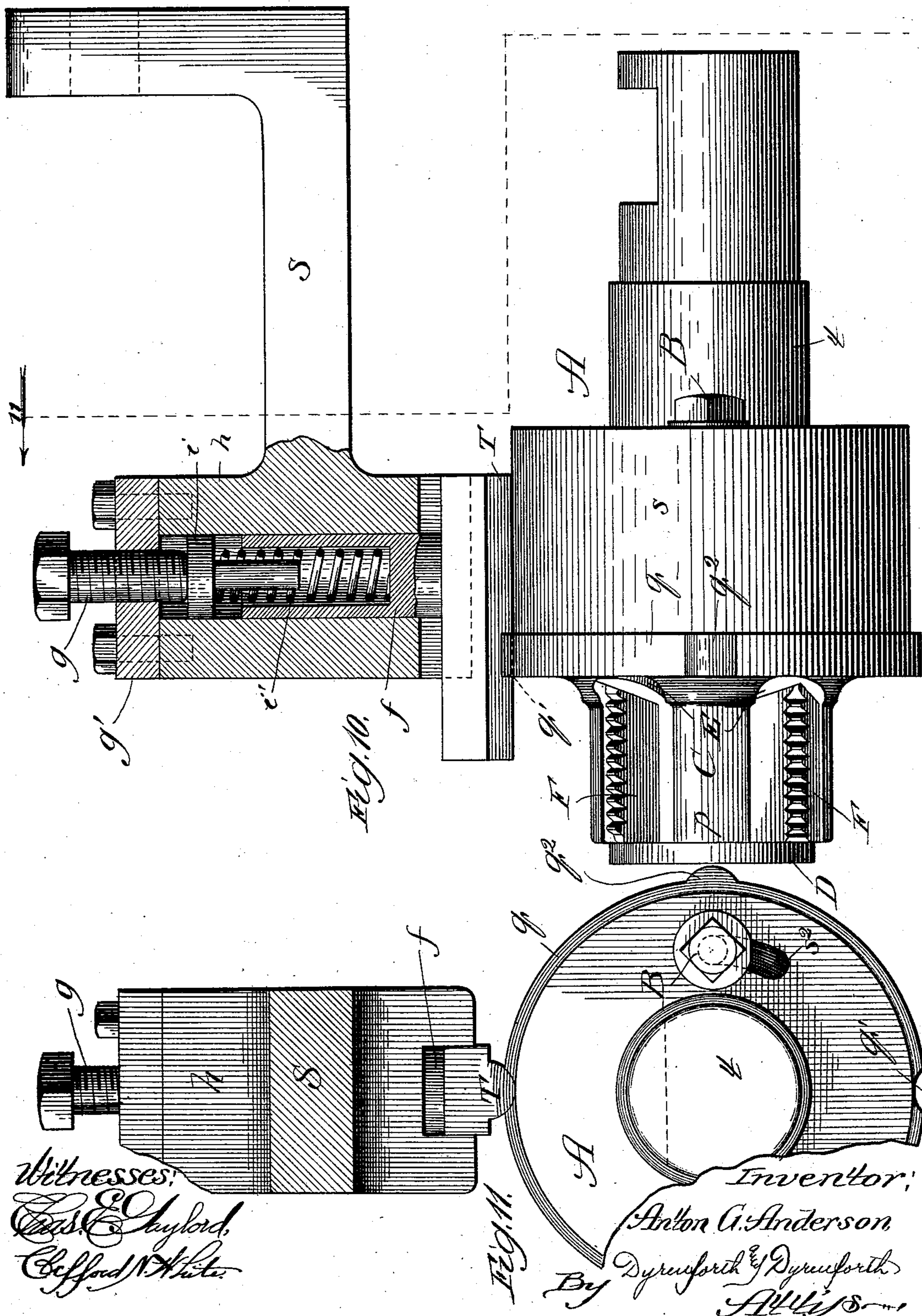
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3 Sheets—Sheet 3.

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COLLAPSIBLE TAP.

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Patented Nov. 21, 1893.



THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ANTON G. ANDERSON, OF CHICAGO, ILLINOIS.

COLLAPSIBLE TAP.

SPECIFICATION forming part of Letters Patent No. 509,113, dated November 21, 1893.

Application filed January 21, 1893. Serial No. 459,105. (No model.)

To all whom it may concern:

Be it known that I, ANTON G. ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Collapsible Taps, of which the following is a specification.

My invention relates to the class of taps termed collapsible, in which the cutters are readily changed in position from one in which they exert their cutting action, to one in which they lie somewhat within the cutting circle, to provide for ready removal from their work and for other purposes.

The object of my invention is to improve the structure of taps of this nature, and more particularly to provide for the ready removal of the cutting tool by itself, without necessitating the removal or re-arrangement of the cutting tool holder. In practice the cutting tool, which comprises a metal bar or spindle having one edge formed with cutting teeth, is filed off as the teeth wear away, and is projected farther in any convenient manner, and when the cutting tool has been so far reduced in length as to be unavailable for further work, it is removed and a new tool substituted.

One of the objects of my invention is to produce a collapsible tap, the cutting tools of which are adjustable independent of each other, and the immediate holders for the cutting tools in which, which holders afford a means for connecting each tool with the common holder, are separate or separable from the tool.

My invention consists in the general and specific construction and arrangement of the parts, all as hereinafter more fully set forth. In the drawings—Figure 1 is a view in side elevation of a collapsible tap constructed in accordance with my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a rear elevation of the cup or main head or holder of the tap. Fig. 4 is a front elevation of the tap, the retaining plate or flange being removed. Fig. 5 is a view partly in elevation and partly in longitudinal section on the line 5 of Fig. 2. Fig. 6 is a view in cross section on the line 6 of Fig. 1. Fig. 7 is a similar view on the line 7 of Fig. 1. Fig. 8 is a plan view of the cut-

ter holder; Fig. 9 a similar view of the cutter; and Figs. 10 and 11 views of the automatic collapsing device.

All sectional views are to be taken as indicated in the arrows there shown.

A represents the main head or holder, comprising the shank portion *t* and cup portion *s*. The cup portion is provided with the grooves *s'* to receive splines upon the cutter holders, as presently described. The rear wall of the cup *s* is provided with elongated curved slots *s*², for the reception of retaining bolts *B*, as presently described.

The cutter head *C* is made of a solid piece of metal, and comprises the inner and large part *r*, the central flanged or ring shaped part *q*, and the forward reduced part *p*. The enlarged part *r* is of a longitudinal dimension to fit within the cup *s*, so that the ring or flange *q* serves to close the cup, while the reduced portion *p* is slightly less than the diameter of the opening in which the tap is to be introduced. The forward end of the cutter head *C* carries the flange or plate *D*. Channels circular in cross section are formed longitudinally through the cutter head to extend from end to end thereof, as shown at *o* in the figures, said channels instead of being circular, however, having at the peripheral edge of the cutter holder the enlarged opening *o'*, producing shoulders *o*². The dimension of the opening *o* is slightly reduced where it passes through the part *p* of the cutter head, as shown at *p'* Fig. 5. The cutter holder comprises a hollow cylinder *E*, the opening through which is preferably square, as shown in the figures, and the external diameter of which is preferably greater in the rear part, as shown at *n*, than in the forward part, as shown at *n'*. The rear or enlarged part *n* carries a spline *n*², which is adapted to enter the radial groove *s'* formed in the cup *s*, as previously mentioned. The forward or reduced part of the holder *E* is cut away in about its upper half, as shown in Fig. 8. In the enlarged part *n* the cutter head is internally screw-threaded, as shown at *m*, Fig. 5, to receive an adjusting screw *m'*. This adjusting screw has a groove on each face, so that it may be turned from the rear or front side by introducing a screw driver.

The cutter proper, F, comprises a short bar, preferably quadrangular in cross section, having one edge formed with cutting teeth l , adjacent to which the face of the metal is preferably milled off in the usual manner with devices of this kind. The dimension of the cutter F is such that it will fit readily in the quadrangular opening formed through the holder E, and its position with relation to the latter may be adjusted by the adjusting screw m' .

In the cutter head C bolt holes are formed to receive the bolts B, by turning which the main head and cutter head are held together. The ring portion q is provided with notches and projections q' q^2 to permit it to be readily grasped in the hand for the purpose of turning the cutter head with relation to the main head.

The operation is as follows: The parts being adjusted together as described, and introduced into the work for the purpose, the cutter head, is through the medium of the ring q , so turned with relation to the main holder that the cutting tools, under the action of the spline and groove n^2 s' , shall lie flush with the circumferential line of the reduced part p of the cutter head; the ring is thereupon turned in the opposite direction, thus turning the cutter head and by the engagement of the spline and groove causing the cutter tool to be projected outward from the cutter holder. When the cutter tool wears away it may be projected farther forward from the cutter holder by turning the set screw m' , and should any cutter tool become injured, it may be removed and a new one adjusted in the holder, without requiring any change in the other cutter tools.

It will be evident that although the quadrangular form in the cutter tool is preferred, it is not essential that this form shall be preserved. Any configuration desired may be given to the cutter tool and the opening therefor in the cutter tool holder, which, while permitting one to be adjustable with relation to the other, shall also cause the cutter tool to be turned with the cutter tool holder. While it is not essential in all operations that the spline n^2 shall be formed on the holder E and the groove in the cup s , it will be quite evident that this arrangement is preferable as contributing greater ease in construction. In as much as the cutter tool holder E is not intended to be adjustable, as in other devices somewhat similar to mine, the necessity for a groove in this part with the spline in the cup is not presented. As usual, the forward bearing of the cutter tool is against the flange D. It is desirable to provide for the ready movement of the ring q , while the tap is rotating, to cause a collapsing of the cutters F, and a device for this purpose is shown in Figs. 10 and 11.

S indicates a bar which may be bolted to a frame above, below or at one side of the tap to extend toward the same. The bar S ter-

minates in a head h , which is hollow and receives the plunger i and spring i' . A bolt g passing through the top g' of the head h serves to adjust the tension of the spring. In the lower part of the head is introduced the hollow shank f of the elongated dog T, which in use, presses against the outer circumferential face of the cup s and ring q and is adapted to enter the notches q' or engage the lugs q^2 , as the case may be. It is preferred, when notches q' are employed, to have the ring q of larger circumferential measurement than the cup s . It is to be understood that either notches q' or lugs q^2 may be employed through out the ring, instead of both as shown in the drawings.

The operation is as follows: The dog T being in engagement with a notch q' or a lug q^2 , the turning of the tap serves to throw out the cutter F, which is held in the advanced position until, by giving a short backward turn to the shank t , (for stopping the cutting action,) the ring F being at this moment engaged at a new notch or lug by the dog T and thus prevented from backward rotation, the cutters are moved back or collapsed within the holder, and thus free to be withdrawn without engaging the cut threads.

When a ring G is employed which is flush with the cup s , the use of the dog T in the form shown involves the use of lugs q^2 instead of notches q' , but where the latter are preferred, and the ring is flush with the cup, the dog T is reduced in length to suit the requirements, and is itself made adjustable on the head h in a well known manner.

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

1. In a collapsible tap, in combination, a cutter holder movable with relation to the main holder, and a removable cutter carried thereby, the bore of the holder and the shank of the cutter made angular in cross section, whereby they are prevented from independent rotation, substantially as described.

2. A collapsible tap comprising in combination a main holder, a cutter head held to the main holder and movable with relation thereto, a cutter tool holder held to the cutter head and movable with relation thereto, and having a bore angular in cross section, and a cutter tool removably supported in the cutter tool holder, and having an external cross sectional configuration to fit in the bore of the holder, substantially as described.

3. A collapsible tap comprising in combination a main holder, a cutter head held to and movable with relation to the main holder, a cutter tool holder movably supported in the cutter head, and having a bore angular in cross section and a cutter tool adjustably and removably supported in the cutter tool holder, and having an external cross sectional configuration to fit in the bore of the holder, substantially as described.

4. In a collapsible tap, in combination, the main holder A having the cup s provided

with groove s' , the cutter head movably secured to the main holder as by bolts B and slots s^2 , said cutter head having the longitudinal circular grooves o and ring q , the cutter tool holder E having the spline n^2 , and the cutter tool F longitudinally movable and transversely fixed in the cutter tool holder E, substantially as described.

5. In a collapsible tap, the combination with the cutter-head, of a cutter tool holder movable with relation to the cutter-head comprising a cylindrical body open from end to end and having its wall partly removed at the forward end, and a cutter-tool adapted to be held in the bore of the cutter-tool holder, the exterior of the cutter-tool shank and the walls of the bore of the cutter tool holder fitting each other and having a configuration whereby the cutter-tool may be prevented from rotating in its holder while permitted

to move longitudinally therein, substantially as described.

6. In combination with the cutter head, plate D and cutter tool, the adjusting screw, having a slot on each face, as and for the purpose described.

7. In combination with a tap having the ring q provided with stops, the dog supported to engage said stops, as and for the purpose described.

8. In combination with a collapsible tap, having the ring q provided with stops, the elongated, spring retained dog T supported to be in contact with the tap and engage the stops, substantially as described.

ANTON G. ANDERSON.

In presence of—

B. M. TAUSIG,

WM. NICHOLAS WILLIAMS.