

(No Model.)

2 Sheets—Sheet 1.

J. W. ABRAHAM'S.
BENDING MACHINE.

No. 570,655.

Patented Nov. 3, 1896.

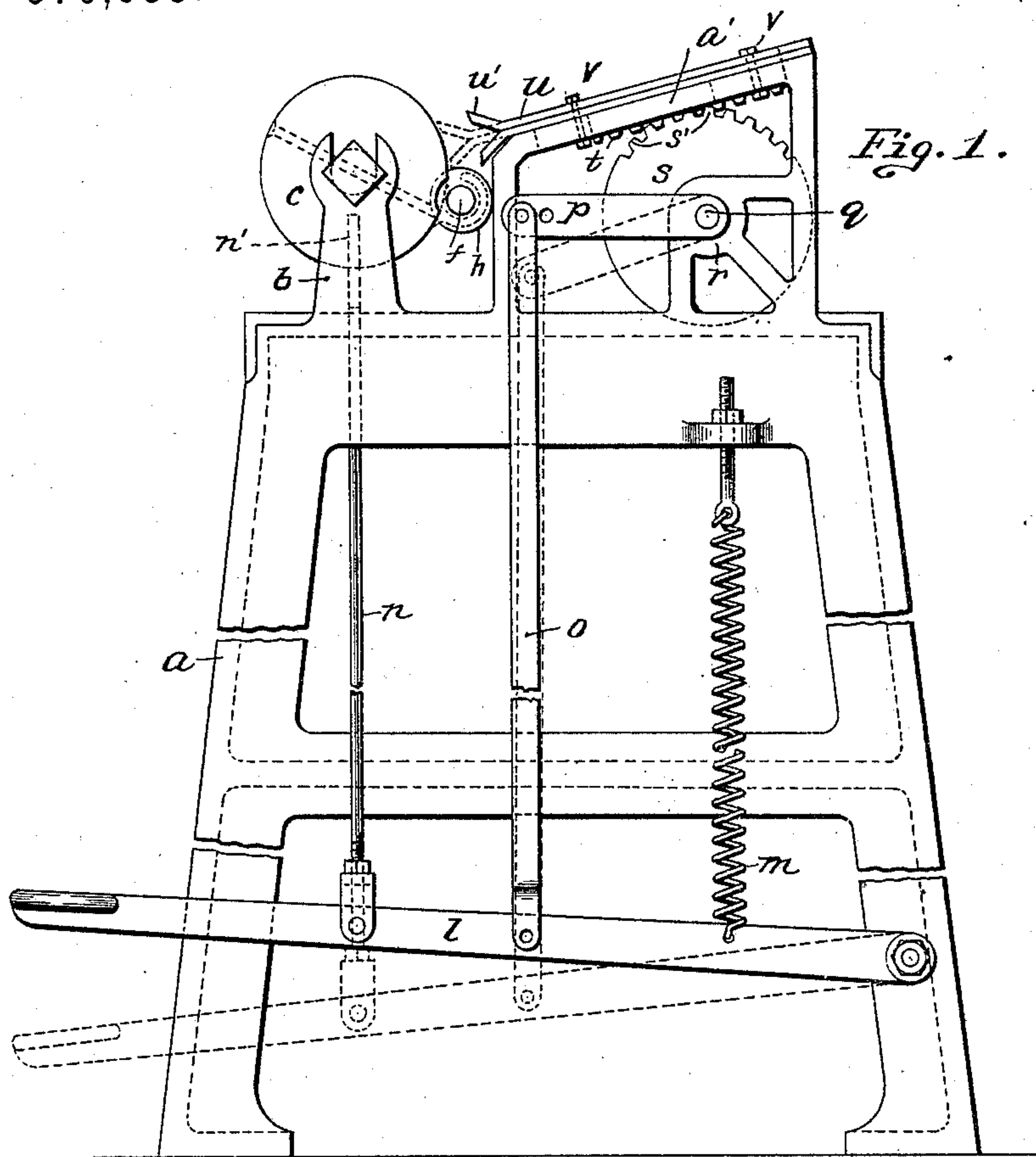


Fig. 3.

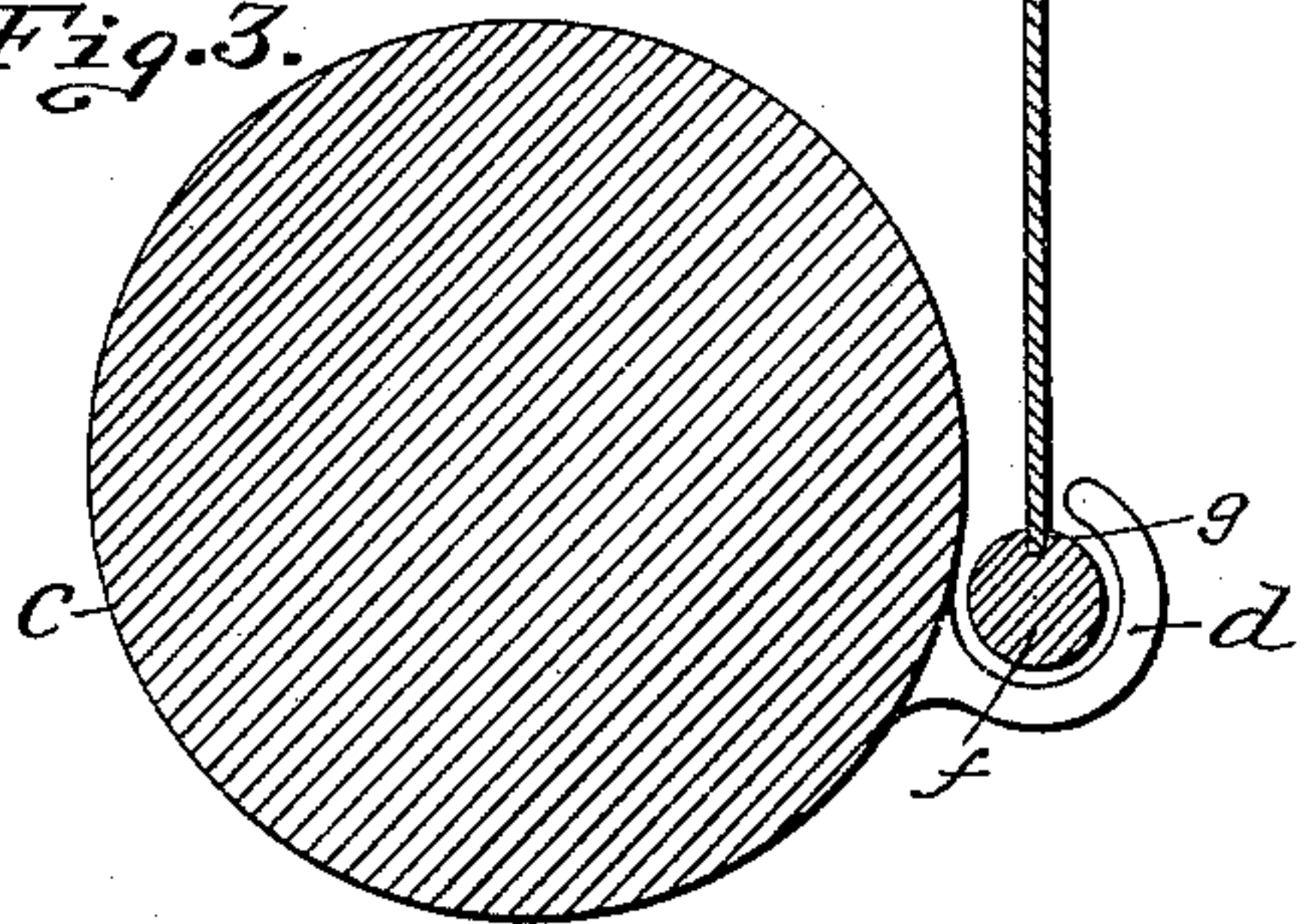


Fig. 4.

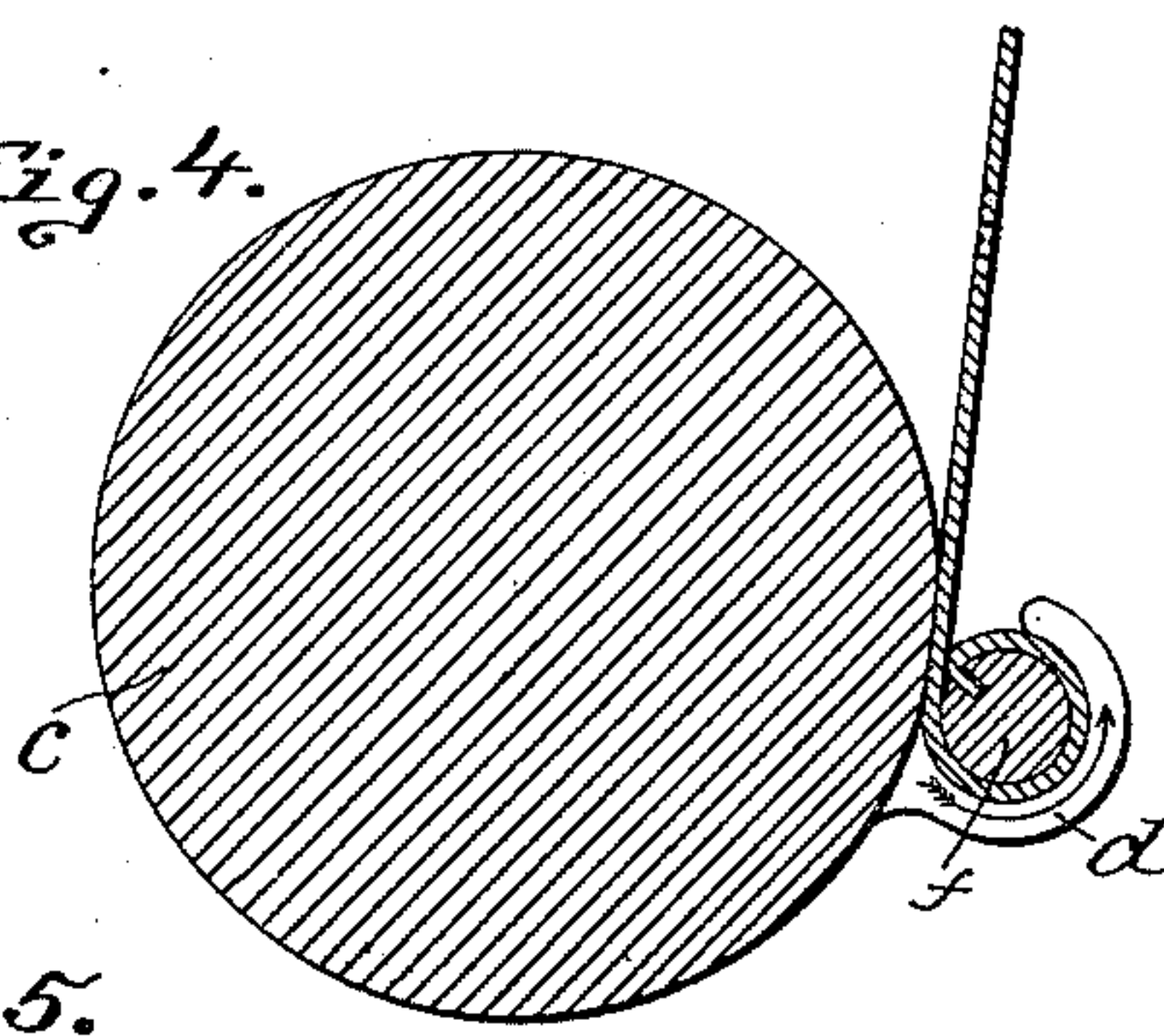
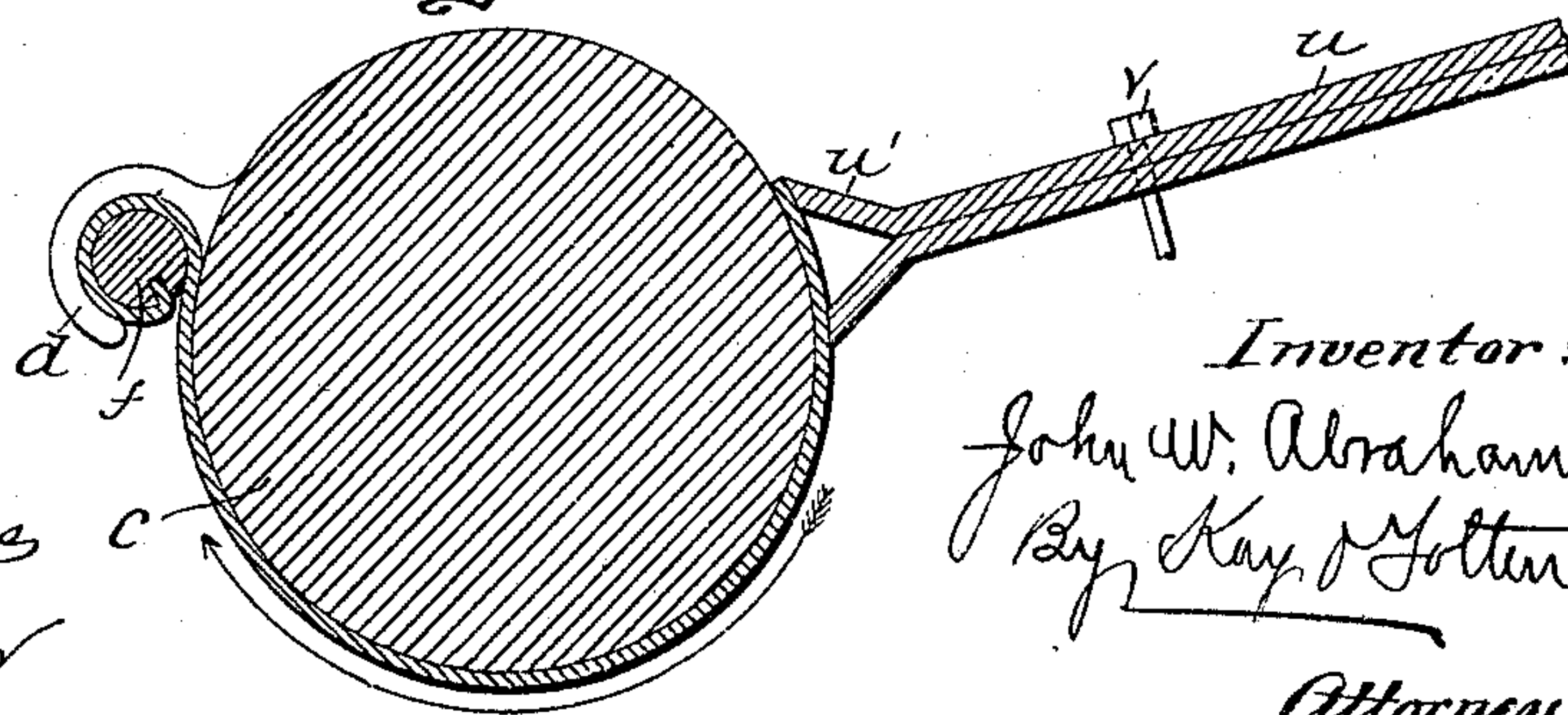


Fig. 5.



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2 Sheets—Sheet 2.

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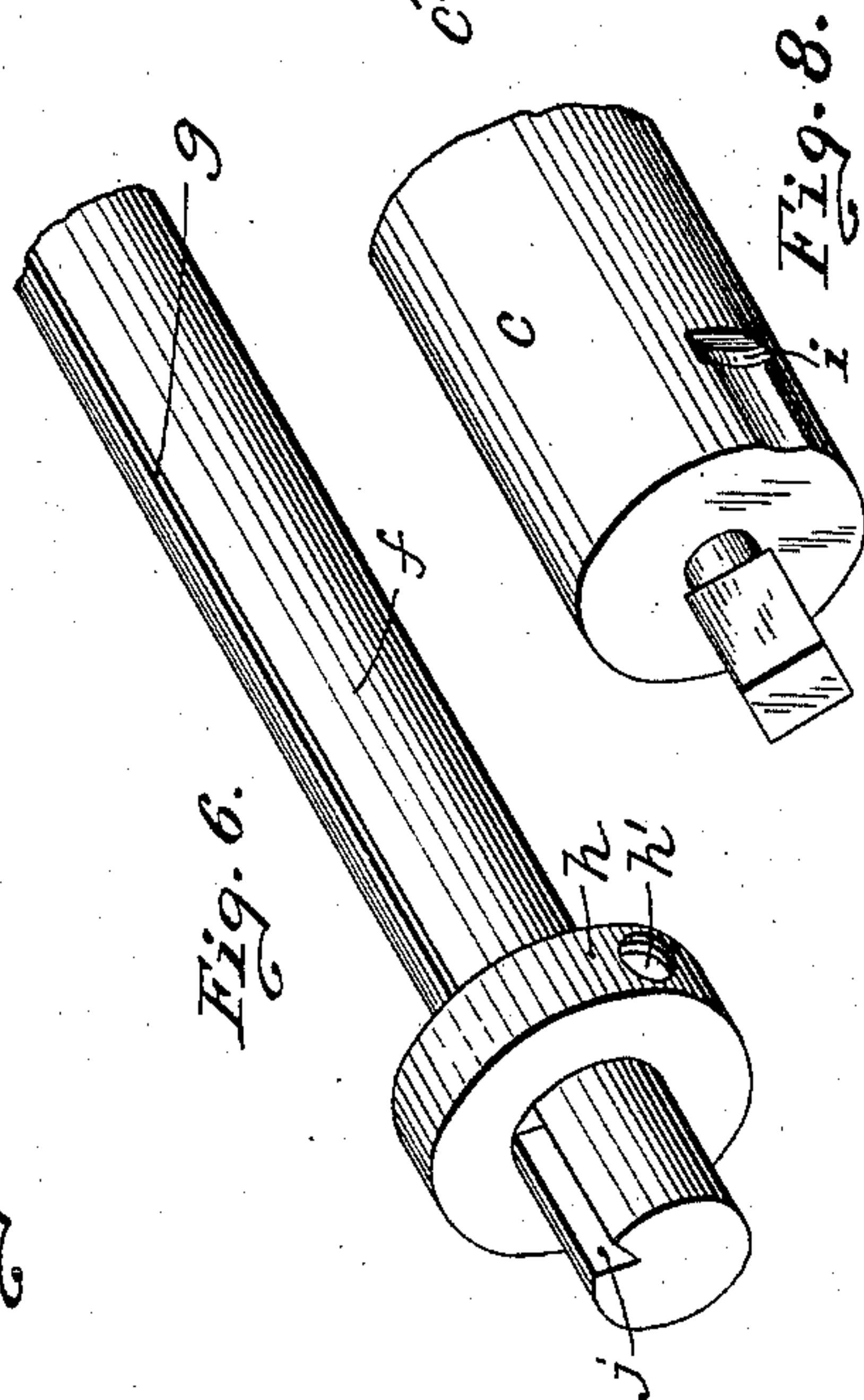
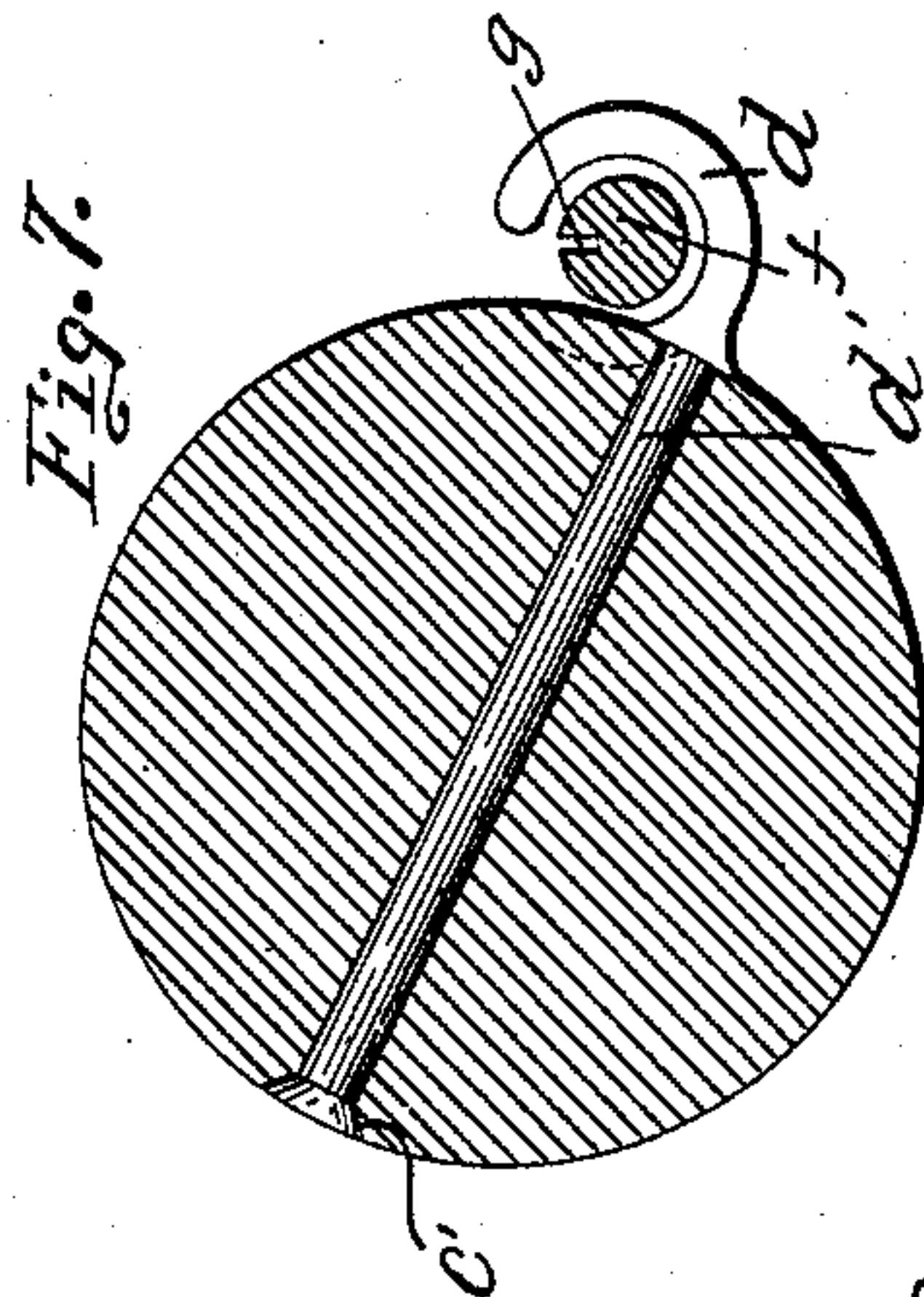
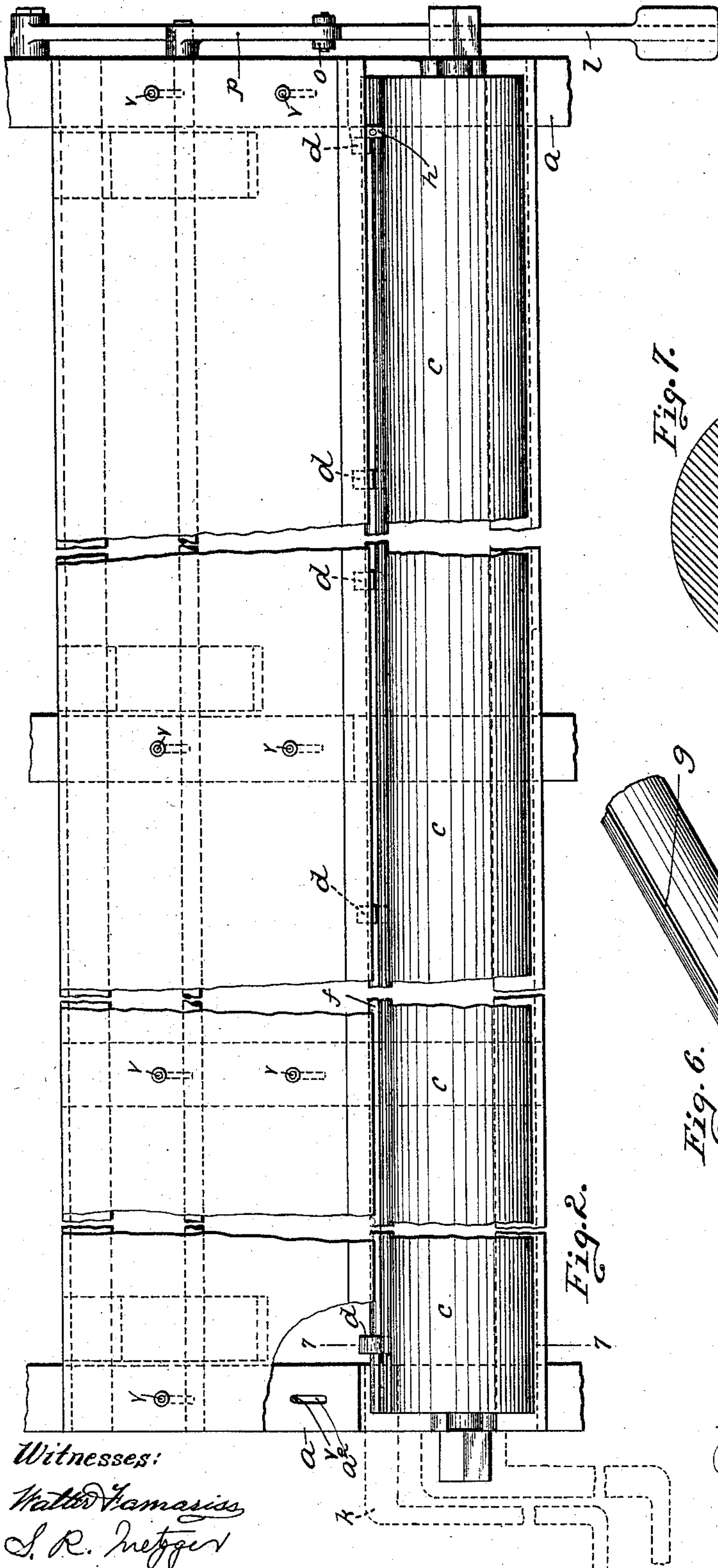


Fig. 8.

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UNITED STATES PATENT OFFICE.

JOHN WILLIAM ABRAHAMS, OF ALLEGHENY, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO HARRY A. MARLIN, OF PITTSBURG, PENNSYLVANIA.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 570,655, dated November 3, 1896.

Application filed January 13, 1896. Serial No. 575,264. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM ABRAHAMS, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have
5 invented a new and useful Improvement in Bending-Machines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to machines for bending metal, its object being to provide a machine by which long lengths of sheet metal may be beaded and accurately bent into shape for eaves-troughs or other purposes by one operation.

15 My invention comprises, generally stated, a bending-roll, a beading-roll carried by said bending-roll and adapted to be rotated independently of said bending-roll, and a reciprocating presser to bear against said bending-roll when said roll is rotated.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

25 Figure 1 is an end view of my improved machine. Fig. 2 is a plan view. Fig. 3 is an enlarged detail view of the bending-roll and beader with the metal in position for beading. Fig. 4 is a like view after the beading operation. Fig. 5 is a like view showing the operation of bending the metal. Fig. 6 is a perspective view of a portion of beader. Fig. 7 is a section on line 7 7, Fig. 2. Fig. 8 is a detail view of one end of bending-roll.

35 The letter *a* represents a suitable frame or support for the several parts of the machine. Mounted in suitable standards *b* on said frame is the bending-roll *c* of any suitable diameter and length. At suitable distances apart on the roll *c* are the brackets *d*, said brackets having the bolts *d'*, which pass through said roll and have their heads within countersunk openings *c'* in said roll, these brackets *d* having hook-shaped ends which inclose the
45 greater part of the beader *f* and form bearings for the said beader *f*. This beader *f* may be of any suitable diameter according to the size of beading desired. A groove or slot *g* is formed in the beader *f*, within which the
50 edge of the metal to be beaded is inserted. To prevent longitudinal movement on the part of the beader *f*, said beader is provided with the collar *h*, held in place by set-screw

h'. This collar is attached to said beader at a point just beyond the end bracket *d*. Furthermore, the bending-roll *c* is cut away at the end adjacent to said collar, as at *i*, to form a recess to receive a portion of the collar *h*. The beader *f* has the seats *j* formed at each end thereof to receive the end of handles *k* for turning said beader.

Secured to the frame *a* is the foot-lever *l*, said lever being normally held in its elevated position by the spring *m*. A rod *n*, secured to the lever *l*, passes up into a seat or recess *n'*, formed within the roll *c*. In this manner the roll *c* may be locked or held from rotating.

A rod *o* is secured at one end to the lever *l* and at its upper end to the crank *p*. This crank *p* is mounted on the shaft *q*, journaled in suitable bearings *r* in the frame *a*. Mounted on the shaft *q* at proper intervals are the pinions *s* with teeth *s'*. The teeth of these pinions engage with the racks *t*. The racks *t* are secured to the presser *u*, said
75 presser extending the entire length of the bending-roll *c*. The presser *u* is supported on the inclined supports *a'* of the frame *a*, said supports having slots *a''* formed therein, within which the bolts *v*, passing through the
80 presser, move. In this manner the presser is moved to and fro when the racks *t* are acted upon by the pinions *s*.

The forward edge *u'* of the presser *u* is forked or V-shaped, so that when it is advanced into contact with the bending-roll *c* it forms two points of contact therewith and conforms more properly with the curve of the roll.

The term "bracket" as used in the specification is intended to include any kind of a support for the beader, whether formed separate therefrom or integral therewith. It is also apparent that instead of a number of brackets one long bracket extending the entire length of the bending-roll may be employed with like effect. Furthermore, the term "hook-shaped" as applied to the shape of said brackets is intended to include any shape which will afford a curved bearing for
95 the beader, so that when said beader is turned within said bearing the beading will be formed therein.

The operation of my improved bending-machine as applied to the manufacture of
105 eaves-troughs is as follows: The galvanized

sheet metal of the proper length and width is inserted with one of its edges engaging the groove *g* of the beader *f*. The metal may be readily inserted by starting it from one end of the groove and pushing it along to the opposite end thereof until it strikes the collar *h*. The insertion of the metal can be accomplished in this manner on account of the hook-shaped ends being open at the top and not forming a complete circle. The metal will then be in the position shown in Fig. 3. By inserting the handles *k* within the seats *j* the operators, one at each end of said beader, turn said beader to the position shown in Fig. 4, when the bead is formed. The beader, together with the brackets having the hook-shaped ends, form the beading, said brackets being located near enough to each other to give the proper curve to the metal when the beader is turned therein. During this operation the bending-roll *c* has been locked and prevented from turning by the rod *n* engaging the seat *n'* in said roll. The bead having been formed, one of the operators puts his foot on the treadle and lowers the lever *l*. By this operation the rod *n* is withdrawn and the bending-roll *c* is free to rotate. At the same time the rod *o* is lowered, operating the crank *p* and turning the pinions *s*. This acts to advance the presser *u* until its forked edge *u'* is brought into contact with the roll *c*, or, rather, into contact with the metal interposed. The bending-roll *c* is then turned by suitable handles to the position shown in Fig. 5, when the eaves-trough is completed and withdrawn from the machine. Just as soon as the foot is removed from the treadle the rod *n* again locks the bending-roll and the pinions *s* draw back the presser *u*. In this manner without removing the metal from the machine it is accurately beaded and bent to shape. The presser contacting with the bending-roll at two points produces a perfect curve on the metal corresponding to the curve of the roll, while the bending operation is done with great rapidity and ease.

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

1. In a bending-machine the combination of a bending-roll, brackets arranged at suitable intervals along said roll, said brackets having hook-shaped ends, the beading-roll fitting within said brackets and adapted to rotate independently of said bending-roll, substantially as set forth.

2. In a bending-machine, the combination of a bending-roll, mechanism for locking said bending-roll, brackets arranged at suitable intervals along said roll, said brackets having hook-shaped ends, a beading-roll fitting within said brackets adapted to rotate independently of said bending-roll, substantially as set forth.

3. In a bending-machine, the combination of a bending-roll, brackets on said bending-roll having bolts extending through the same,

said brackets having hook-shaped ends and a beading-roll fitting within said brackets and adapted to rotate independently of said roll, substantially as set forth.

4. In a bending-machine, the combination of a bending-roll, a beader carried thereby adapted to rotate independently of said bending-roll, and a reciprocating presser having a forked edge adapted to bear against said roll, substantially as set forth.

5. In a bending-machine, the combination of a bending-roll, a beader carried thereby adapted to rotate independently of said bending-roll, and a reciprocating presser, substantially as set forth.

6. In a bending-machine, the combination of a bending-roll, a beader carried thereby adapted to rotate independently of said bending-roll, a reciprocating presser, and mechanism for locking said bending-roll and releasing the same and for operating said presser at the same time, substantially as set forth.

7. In a bending-machine, the combination with a suitable frame, of a bending-roll mounted therein, a beader carried thereby adapted to rotate independently of said bending-roll, a lever, connections between said lever and bending-roll for locking the same, a reciprocating presser, and connections between said lever and presser, substantially as set forth.

8. In a bending-machine, the combination with a suitable frame of a bending-roll mounted therein, a beader carried thereby adapted to rotate independently of said bending-roll, a lever, connections between said lever and said roll for locking the same, a presser having racks thereon, pinions engaging said racks, and connections between said pinions and said lever, substantially as set forth.

9. In a bending-machine, the combination with a suitable frame, of a bending-roll mounted therein, a beader carried thereby adapted to rotate independently of said bending-roll, a lever, connections between said lever and said roll for locking the same, a presser having racks thereon, a shaft carrying pinions engaging said racks, a crank on said shaft, and a rod connecting said crank and lever, substantially as set forth.

10. In a bending-machine, the combination with a suitable frame, of a bending-roll mounted therein, a beader carried thereby adapted to rotate independently of said bending-roll, a lever, a rod extending from said lever into a recess in said bending-roll, a reciprocating presser, and connections between said lever and said presser for operating the same, substantially as set forth.

In testimony whereof I, the said JOHN WILLIAM ABRAHAMS, have hereunto set my hand.

JOHN WILLIAM ABRAHAMS.

Witnesses:

ROBT. D. TOTTEN,
ROBERT C. TOTTEN.