

(No Model.)

2 Sheets—Sheet 1.

B. ADRIANCE.

HORN FOR CAN FORMING MACHINES.

No. 389,828.

Patented Sept. 18, 1888.

Fig. 1.

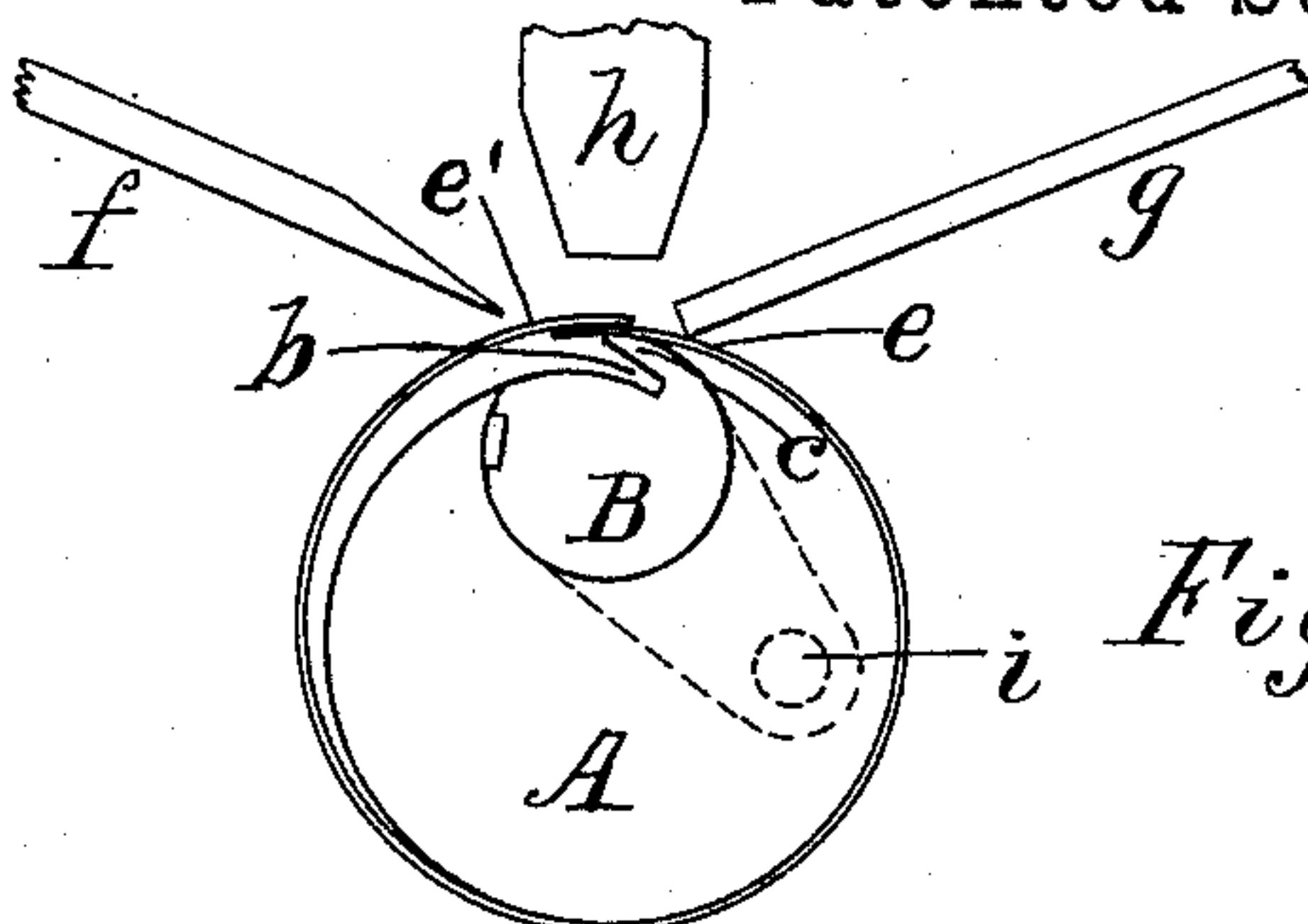
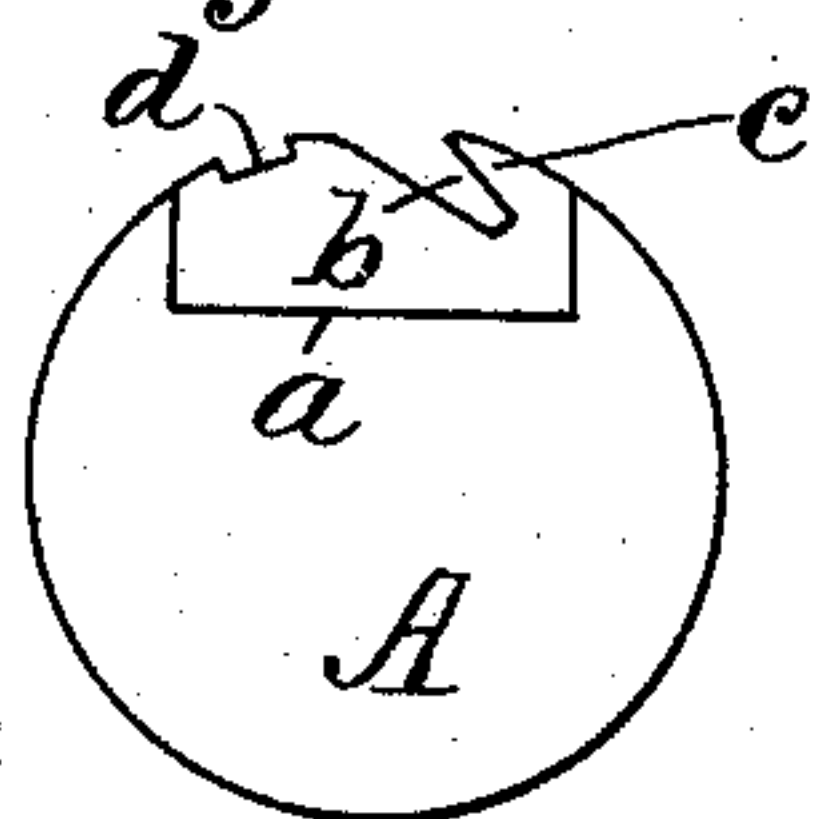


Fig. 2.

Fig. 7.

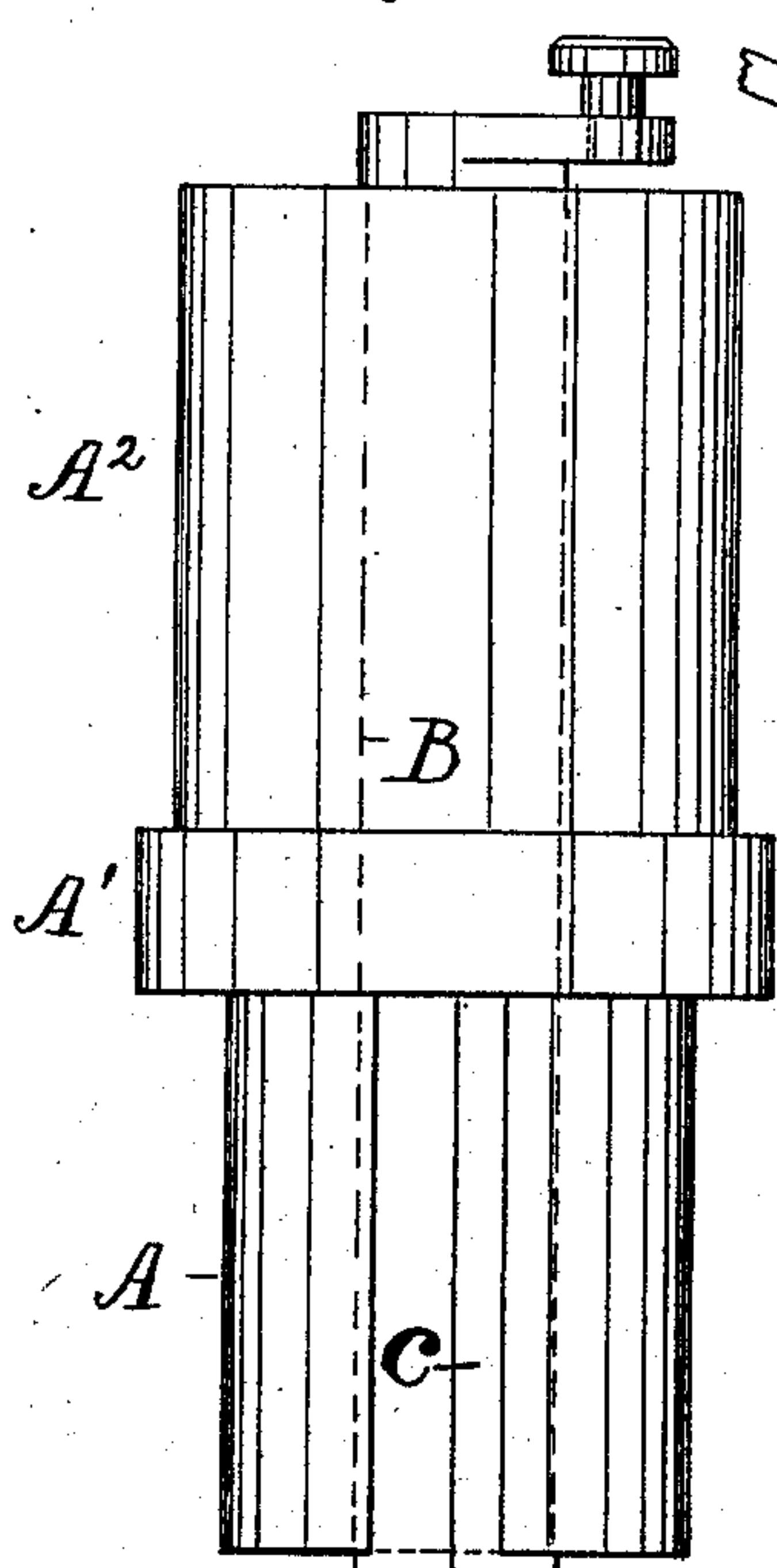


Fig. 6.

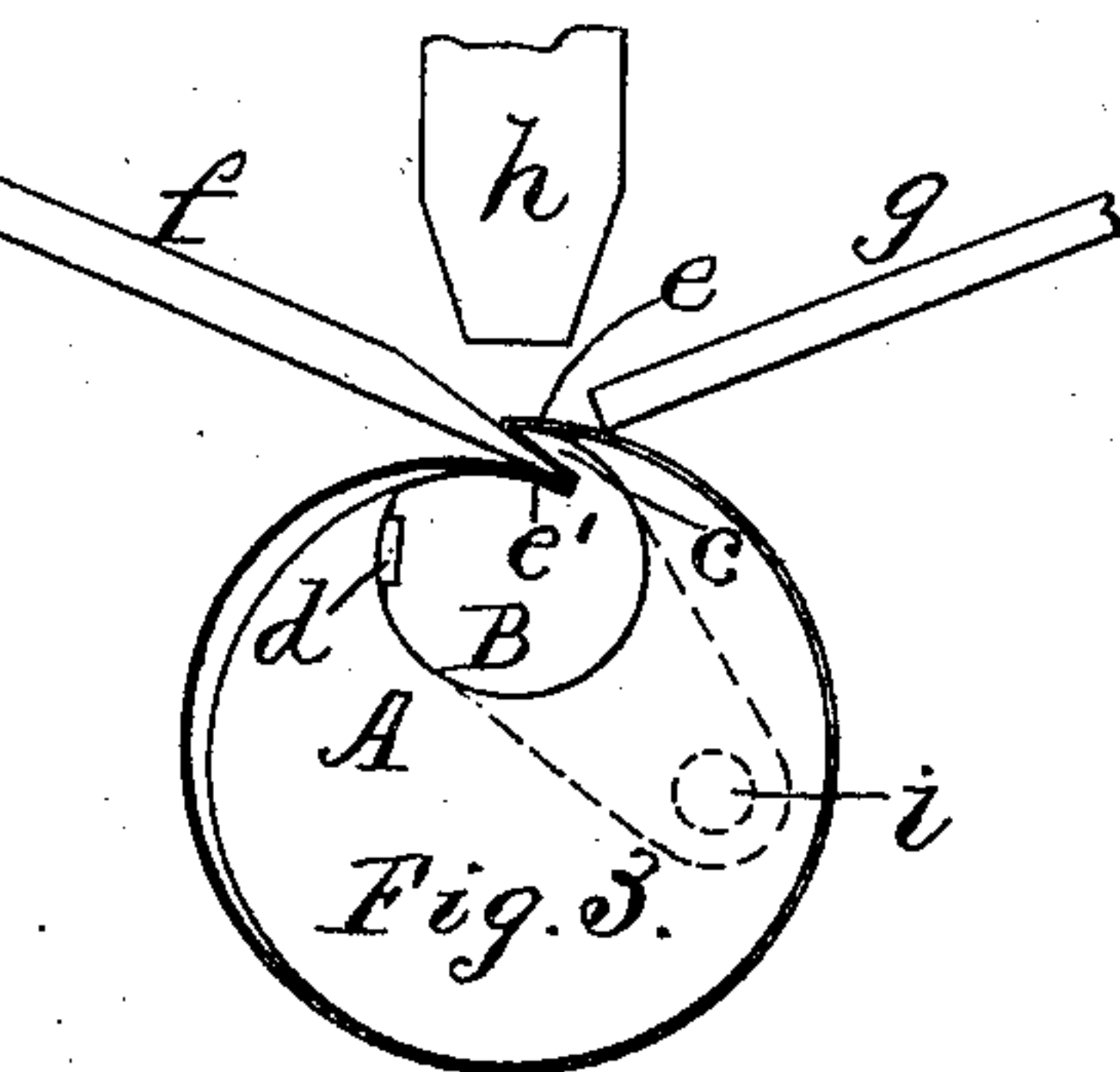
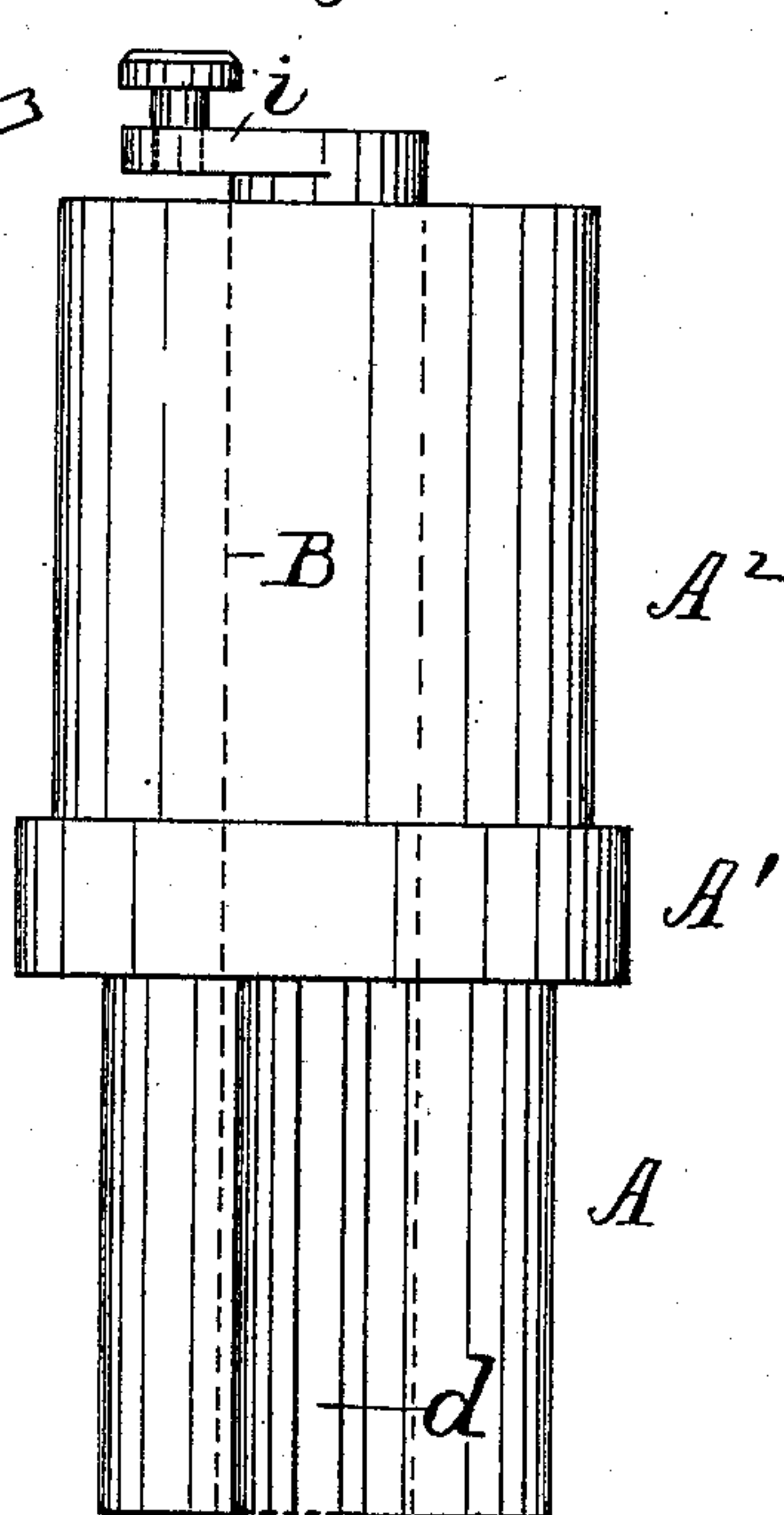


Fig. 3.

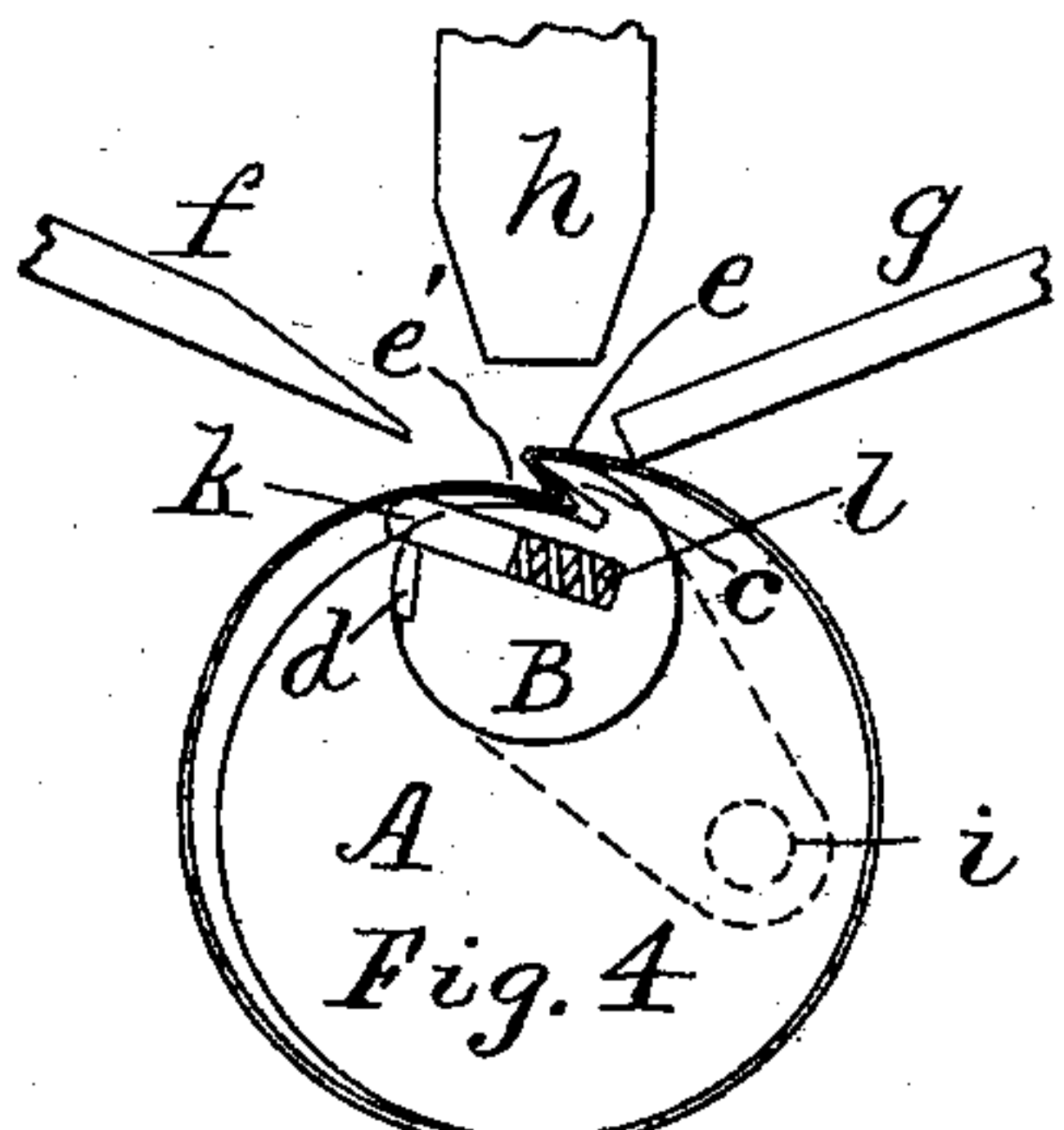


Fig. 4.

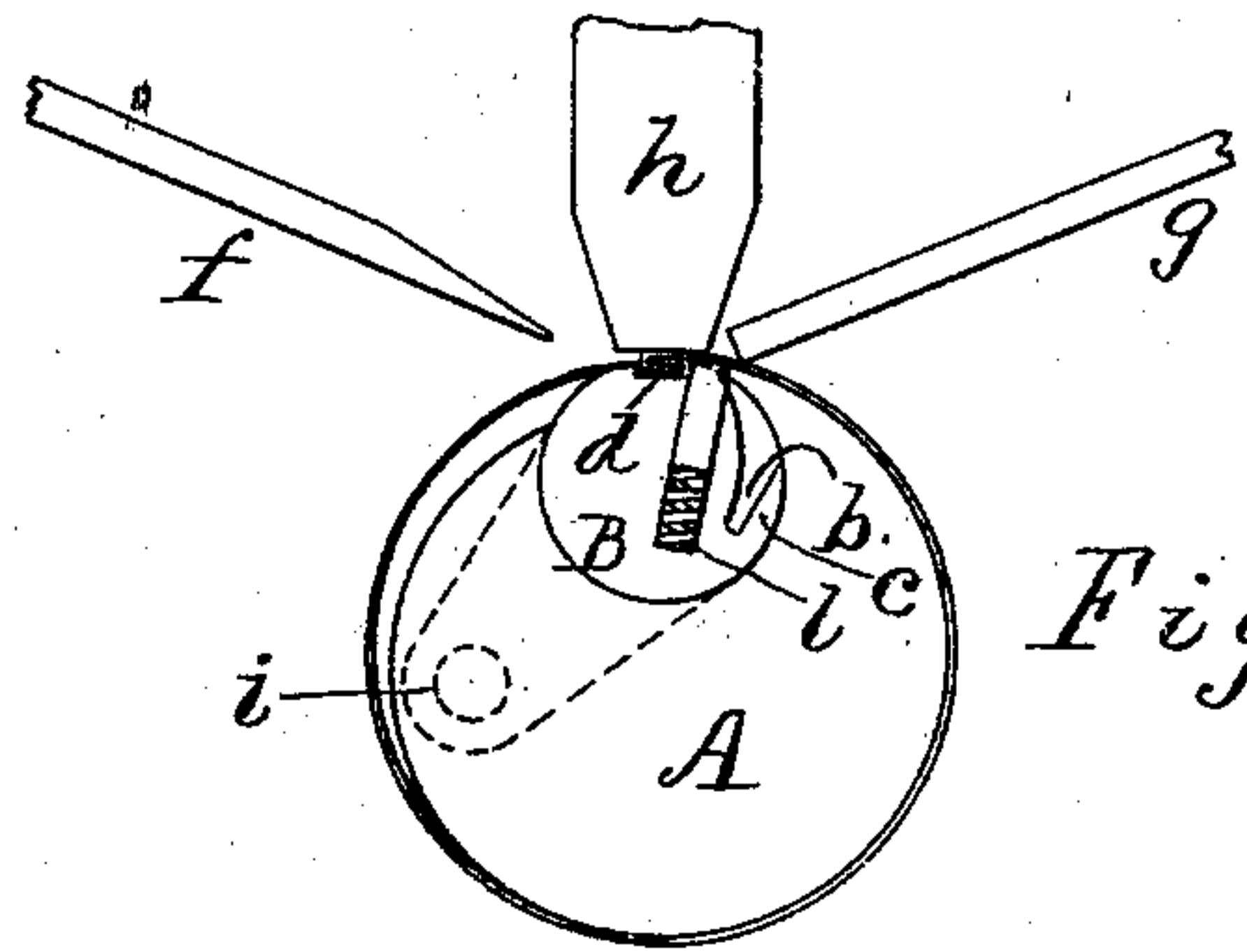


Fig. 5.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 8

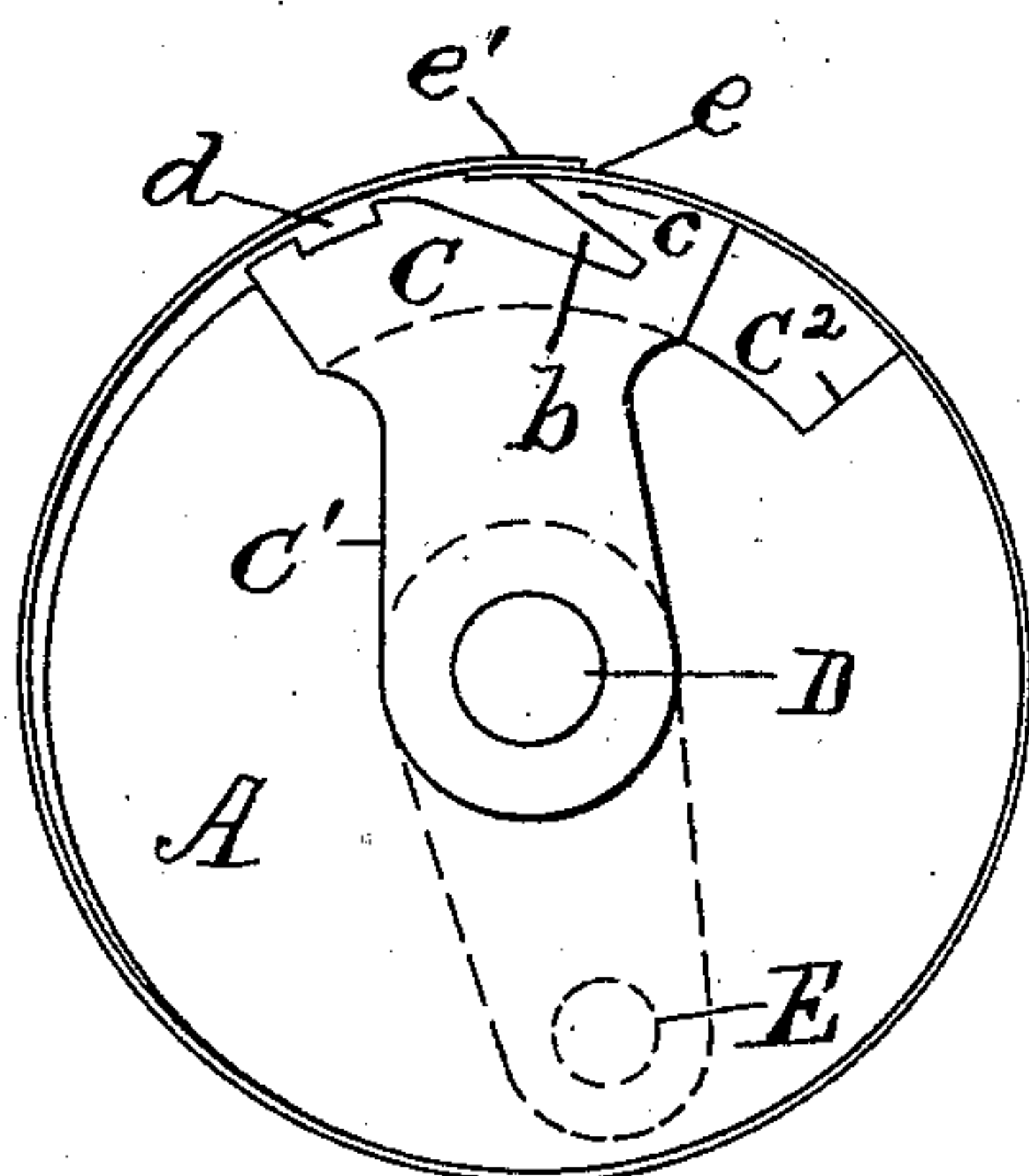


Fig. 10.

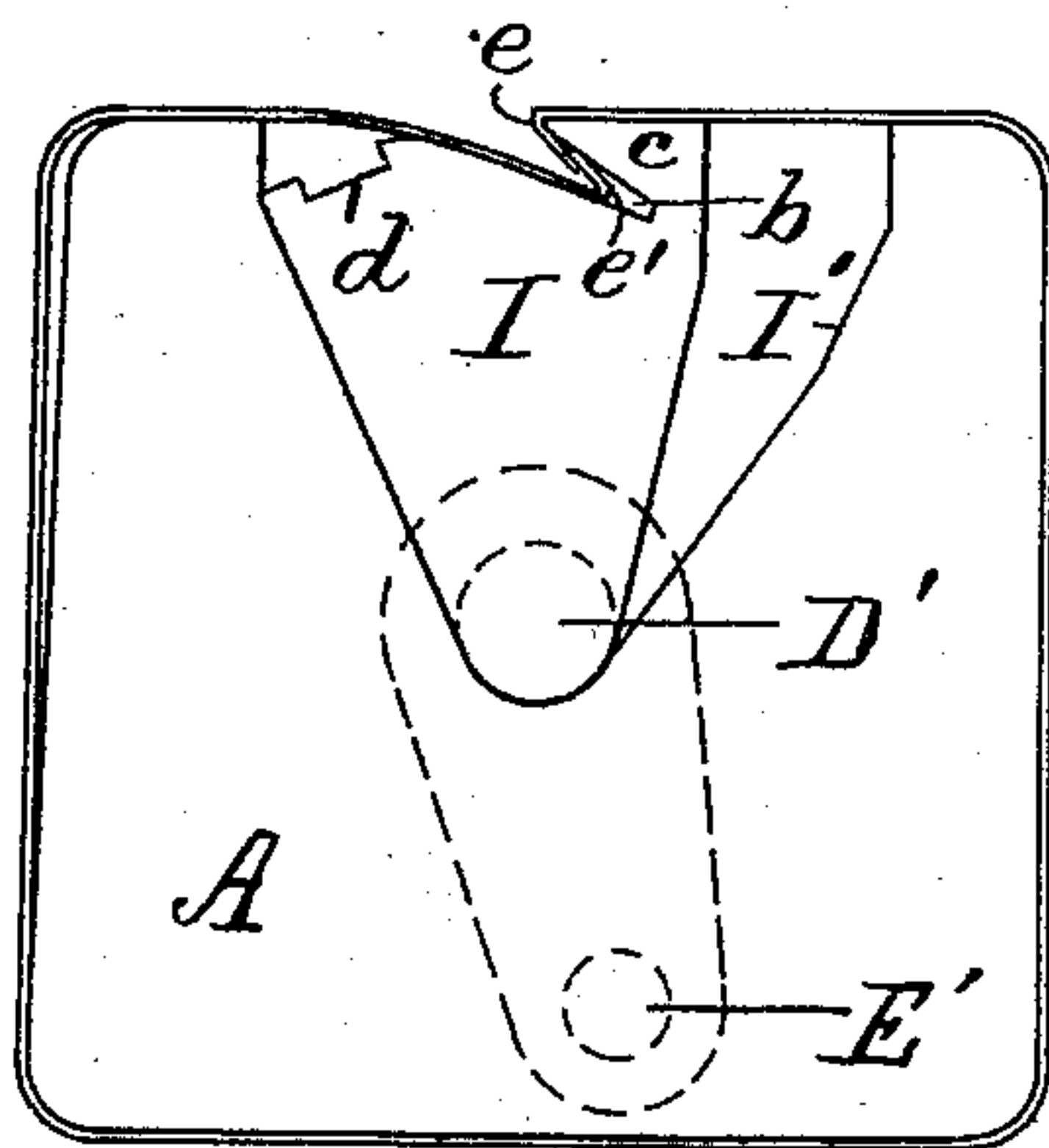
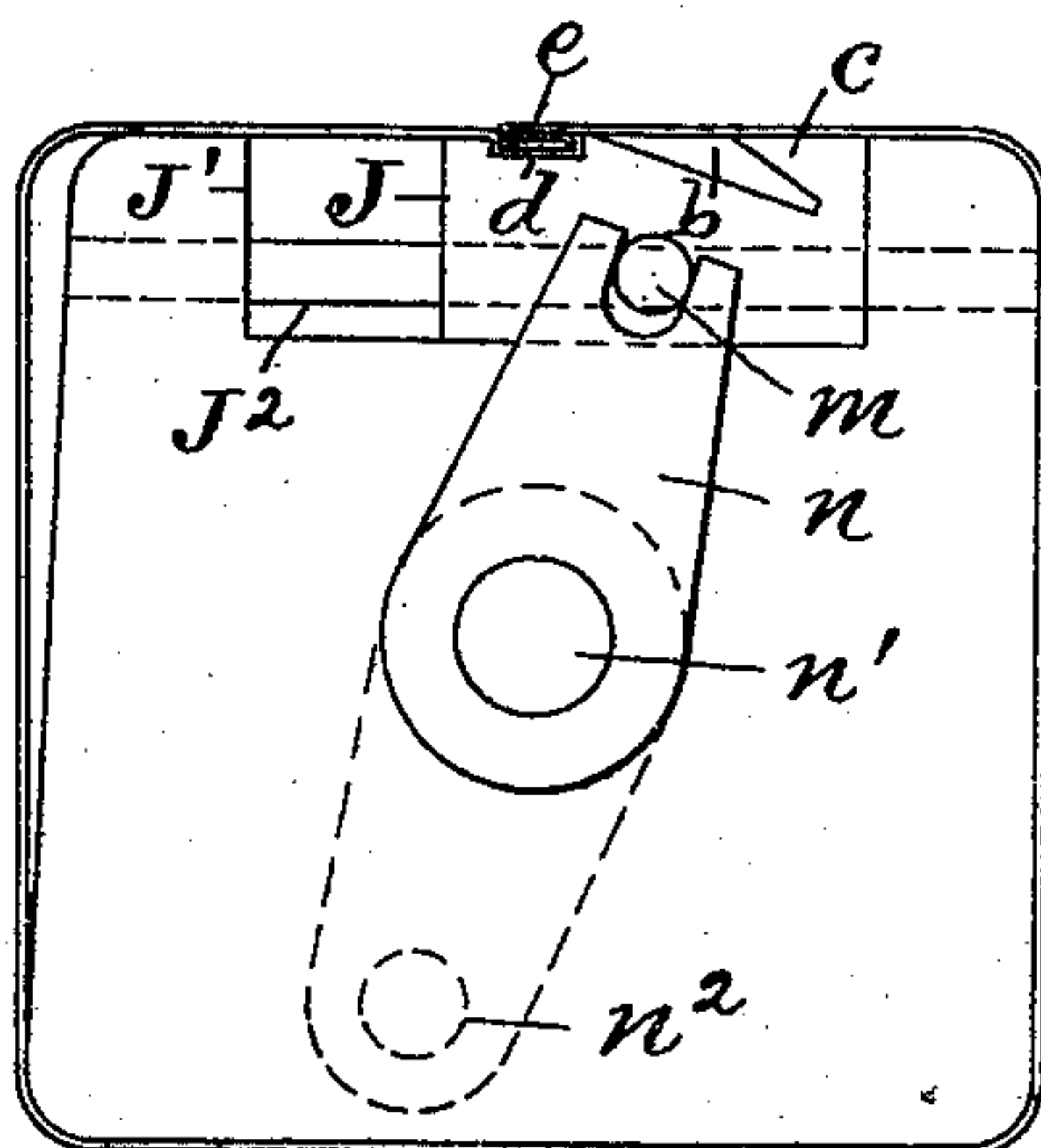


Fig. 9.



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UNITED STATES PATENT OFFICE.

BENJAMIN ADRIANCE, OF BROOKLYN, NEW YORK.

HORN FOR CAN-FORMING MACHINES.

SPECIFICATION forming part of Letters Patent No. 389,828, dated September 18, 1888.

Application filed January 23, 1888. Serial No. 261,589. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN ADRIANCE, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Horns for Sheet-Metal-Can-Forming Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

10 The object of this invention is to simplify the construction and operation of the bending and closing devices which are attached to the horn or mandrel in a can-seaming machine; and the invention consists in the combination, 15 with the horn, of a longitudinal groove formed with a tongue at one side to bend the edges of the sheet metal and of a seat for closing the seam formed parallel with such seat by the side of the same, so that the groove and the 20 seat may perform their functions upon the sheet metal by a lateral movement. The lateral motion may be effected by moving the sheet metal from the groove to the seat, or by forming the groove and seat in a movable die 25 and moving the same laterally upon the horn while the sheet metal is clamped thereto.

As my improvements relate exclusively to the horn, I have shown herein no means for moving the sheet metal laterally, but have 30 shown the horn with the groove and seat fixed rigidly therein, and also in a variety of constructions in a movable die fitted to the operative surface of the horn.

In the drawings, Figure 1 is an end view of 35 the horn, with the groove, the tongue, and the seat formed in a die and fixed rigidly upon the horn. Figs. 2, 3, 4, and 5 are end views of a horn having a rotary die fitted therein and provided with the groove, tongue, and seat, 40 the several views representing certain auxiliary tools in different relations to the sheet metal and the sheet metal at different stages of the seaming process, as hereinafter described. Fig. 6 is a plan of the horn and its shank as it 45 would appear when removed from the seaming-machine, with the die shifted to the right; and Fig. 7 is a similar view with the die shifted to the left. Figs. 6 and 7 are upon a larger scale than the previous figures. Fig. 8 is an 50 end view of a horn, with a segmental oscillating die. In the preceding figures the horn is shown round, and the die, when movable, ar-

ranged to oscillate about an axis parallel to and within the horn; but in Fig. 9 is shown a horn for a square can, with the die movable parallel with the side of the can. Fig. 55 10 is a horn for a square can, provided with an oscillating die adapted to support the metal on a line with the side of the can. Figs. 8, 9, and 10 are upon a larger scale 60 than Figs. 1 to 5, to exhibit the sheet metal more clearly, and the sheet metal is shown in the same relations to the die in Fig. 8 as in Fig. 2, in Fig. 10 as in Fig. 4, and in Fig. 9 as in Fig. 5. 65

In Fig. 1, A is a round horn; *a*, a die fitted rigidly therein to permit the renewal of the working-faces; and *b* is a longitudinal groove 70 formed therein at an acute angle with the periphery, and of sufficient depth for both the edges of the sheet metal to be forced therein and the flanges bent thereon and moved past one another.

c is the tongue formed by the acute intersection of the groove with the surface of the die, 75 and *d* is a seat for the closing of the flanged edges together to finish the seam, the seat being a shallow flat longitudinal channel parallel with the groove *b*. The seat is channeled in the surface of the die to set the seam flush upon 80 the outside of the can; but such channel is not essential to the mere closing of the seam.

In Figs. 6 and 7 the horn A is shown formed with a shank, A², and collar A', and recessed longitudinally near one side to receive a cy- 85 lindrical die, B, upon the rear end of which is fixed a crank, *i*, to oscillate the die within the horn. The die is provided with the adjacent tongue, groove, and seat, like the die *a*, as shown in Fig. 2, where the crank is shown 90 turned to the right with the tongue *c* adjusted to bend the edges of the can. One edge, *e*, of the blank is projected beyond the tongue sufficiently to form a flange, and the opposite edge, *e'*, is lapped upon the same twice the 95 width of such flange. A presser or clamp, *g*, is pressed upon the edge *e*, and a bender, *f*, is shown adjacent to the edge *e'*. The bender is shaped to nearly fill the groove, and is shown in Fig. 3 forced into the groove *b* nearly parallel with the inner face of the tongue, so as to 100 turn the edge *e* inward while bending the edge *e'* outward in contact therewith. When the bender is retracted from the groove, as shown

in Fig. 4, the flanges bent upon the sheet metal tend to open slightly, and the outward spring of the edge e' causes the flanges to interlock, as shown in Figs. 4 and 10, thus fitting them for the closing of the seam. To make the edge e' spring outward, if its elasticity be insufficient, a spring-lifter, k , may be inserted in a longitudinal groove in the die and pressed outward, as by the spring l , thus securing the positive interlocking of the edges when the bender is withdrawn. When the edges are thus interlocked, they are prepared for closing, and the die B may then be rotated in the horn by means of the crank i , and the seat d brought beneath the interlocked edges to be closed by the hammer or punch h , as shown in Fig. 5.

The edge e is represented in Figs. 2 to 5, inclusive, as clamped upon the horn adjacent to the die by the presser g , with the edge e' movable to be bent against the edge e in the desired manner. The lifter k is adapted to yield when the seat d is turned into its operative position, as is shown in Fig. 5.

In Fig. 8 an oscillating die, C, is shown fitted into a segmental recess, C^2 , in one side of a round horn, and oscillated by an arm, C' , upon the front of the horn, attached to a central shaft, D, provided with a crank, E, at its rear end. The sheet metal is shown in the first position, and the die would be oscillated in the recess for closing the seam when the flanges had been properly turned over the tongue c . Another oscillating die, I, is shown in Fig. 10, formed of sector shape and fitted in a sectoral recess, I' , which would be extended the whole length of the horn, and the die affixed to a shaft, D', extended through the shank A^2 and actuated by a crank, E'.

The horn is shown of square shape, and the tongue c and seat d are shown at right angles to the sides of the sector to coincide with the square form of the can when in operation. The edges of the metal are shown with the flanges bent and partially interlocked, as in Fig. 4.

In Fig. 9 a die, J, is shown fitted in a recess, J' , parallel with the side of a square horn, and held therein by a transverse pin, J^2 . The die is provided with a stud, m , to which is applied a slotted arm, n , affixed to a shaft, n' , extended through the horn, and actuated by a crank, n^2 , at its rear end to slide the die back and forth in its recess when required. The sheet-metal seam is shown closed upon the seat d .

The essential part of my invention is the combination of a groove, b , formed at an acute angle with the surface of the die to produce a tongue, c , (over which the edges of the sheet metal may be bent by a suitable bender fitted approximately to the groove, so as to press one of the sheet-metal edges therein in contact with the groove, as shown in Fig. 3,) with a seat, d , arranged adjacent to the groove and parallel thereto, for closing the seam when the edges have been bent and interlocked in the groove.

Having thus set forth my invention, what I claim herein is—

1. The combination, with a horn or mandrel for a can-seaming machine, of a die having a longitudinal groove provided with a tongue at one side for bending the sheet metal, and a longitudinal seat arranged by the side of the groove and parallel therewith for closing the seam, as and for the purpose set forth.

2. In a can-seaming machine, the combination, with a movable die having a longitudinal groove provided with a tongue at one side for bending the sheet metal, and a longitudinal seat arranged parallel with the groove for closing the seam, of mechanism for shifting the die and moving the groove and seat laterally to and from the edges of the sheet metal, as and for the purpose set forth.

3. In a can-seaming machine, the combination, with a movable die having a longitudinal groove provided with a tongue at one side for bending the sheet metal, and a longitudinal seat arranged parallel with the groove for closing the seam, of mechanism for shifting the die and moving the groove and seat laterally to and from the edges of the sheet metal, a presser to hold the sheet metal adjacent to the tongue, and a bender adapted to force one edge of the sheet metal into the groove in contact with the other edge of the sheet metal, as and for the purpose set forth.

4. In a can-seaming machine, the combination, with a movable die having a longitudinal groove provided with a tongue at one side for bending the sheet metal and a longitudinal seat arranged parallel with the groove for closing the seam, of mechanism for shifting the die and moving the groove and seat to and from the edges of the sheet metal, a presser to hold the sheet metal adjacent to the tongue, and a bender adapted to force one edge of the sheet metal into the groove in contact with the other edge of the sheet metal, and operated to bend both edges of the sheet metal simultaneously and to push one of such edges past the other to prepare them for interlocking, as and for the purpose set forth.

5. In a can-seaming machine, the combination, with a movable die having a longitudinal groove provided with a tongue at one side for bending the sheet metal and a longitudinal seat arranged parallel with the groove for closing the seam, of a presser operated to hold the sheet metal with one edge projecting over the tongue, a bender operated to force one edge of the sheet metal into the groove in contact with the other edge of the sheet metal and beyond the same, to prepare them for interlocking, and then retracted to permit such interlocking, and mechanism to shift the die to bring the seat beneath such interlocked edges, substantially as herein set forth.

6. In a can-seaming machine, the combination, with the horn for supporting the can, of a movable die having a longitudinal groove provided with a tongue at one side for bending the sheet metal, and a longitudinal seat

arranged parallel with the groove for closing the seam, of mechanism for shifting the die and moving the groove and seat to and from the edges of the sheet metal, as and for the purpose set forth.

7. In a can-seaming machine, the combination, with the horn for supporting the can, of a cylindrical die fitted longitudinally in one side of the horn, and having a longitudinal groove provided with a tongue at one side for bending the sheet metal, and having a seat parallel with the groove for closing the seam, and mechanism for rotating the die within the side of the horn, as and for the purpose set forth.

8. In a can-seaming machine, the combination, with a horn for supporting the can, of a movable die provided with a longitudinal groove, having tongue at one side, as set forth, and with a seat for closing the seam, a closing-tool reciprocated to and from the horn, as set forth, a bending-tool and closing-tool for

forming the seam, as set forth, and mechanism for shifting the die and moving the groove and seat to and from the edges of the sheet metal, the whole arranged and operated substantially as herein set forth.

9. The combination, with a horn having a die provided with a longitudinal groove with tongue at one side, as set forth, and with a parallel seat adjacent to the groove for closing the seam, of the lifter *k*, inserted in the die parallel with the groove and pressed outward by a spring to force the bent flanges of the sheet metal together, substantially as herein set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

BENJAMIN ADRIANCE.

Witnesses:

L. LEE,

HENRY J. MILLER.