

(No Model.)

2 Sheets—Sheet 1.

H. W. LEONARD & J. STEVENS.  
MACHINE FOR BENDING PAIR BOTTOMS.

No. 335,079.

Patented Jan. 26, 1886.

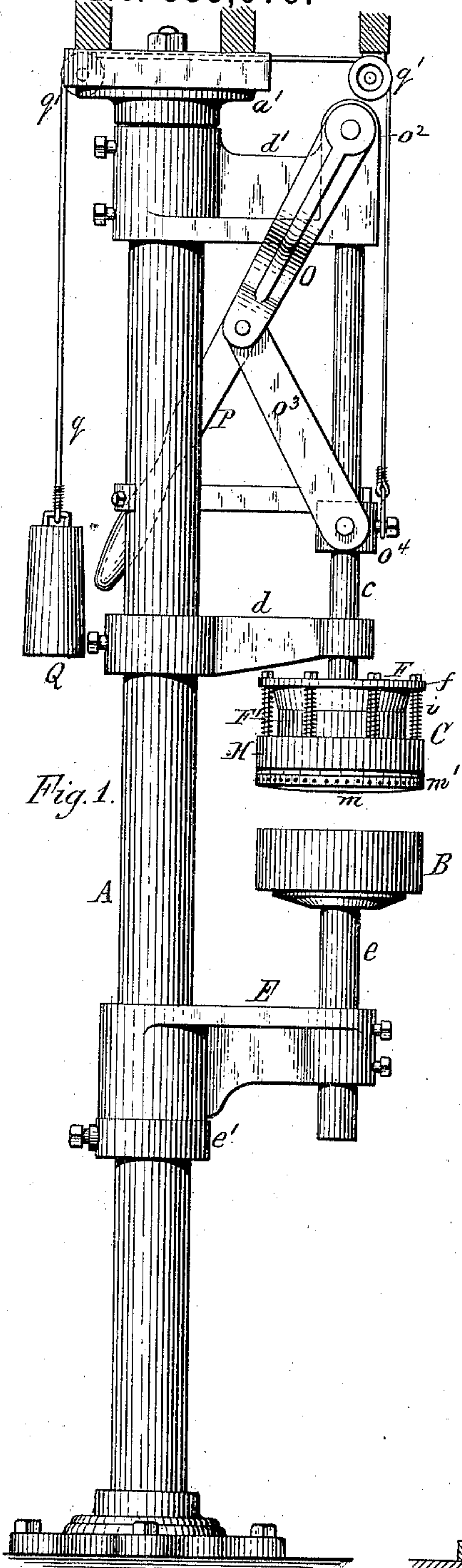


Fig. 1.

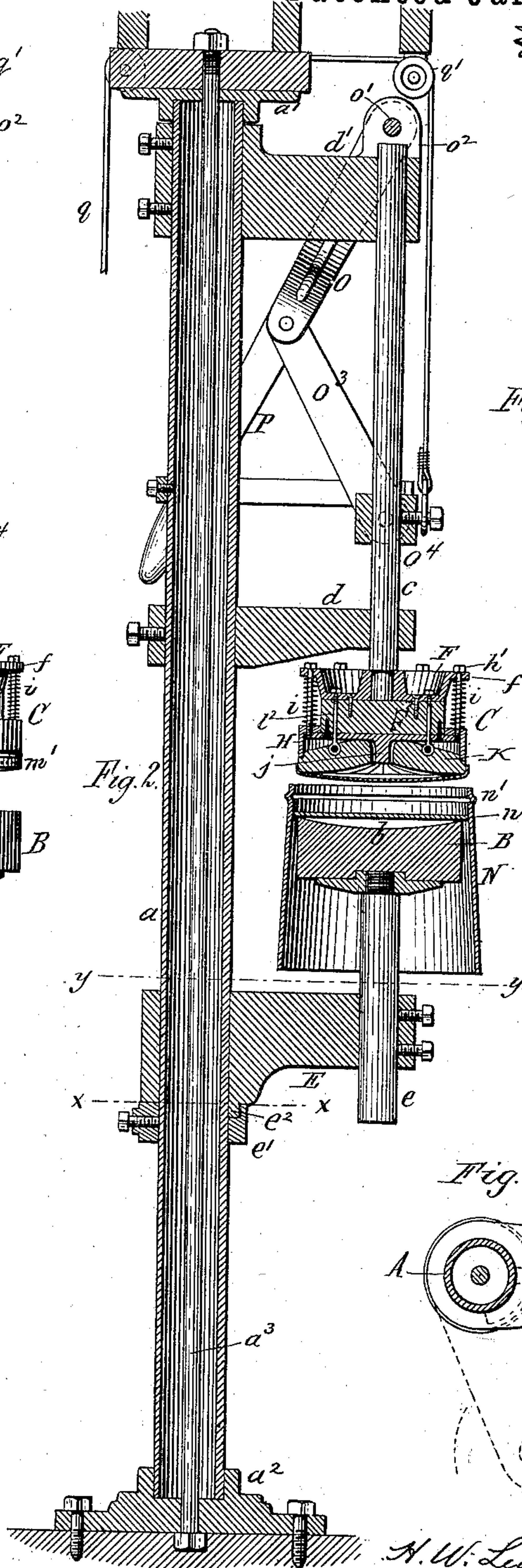


Fig. 2.

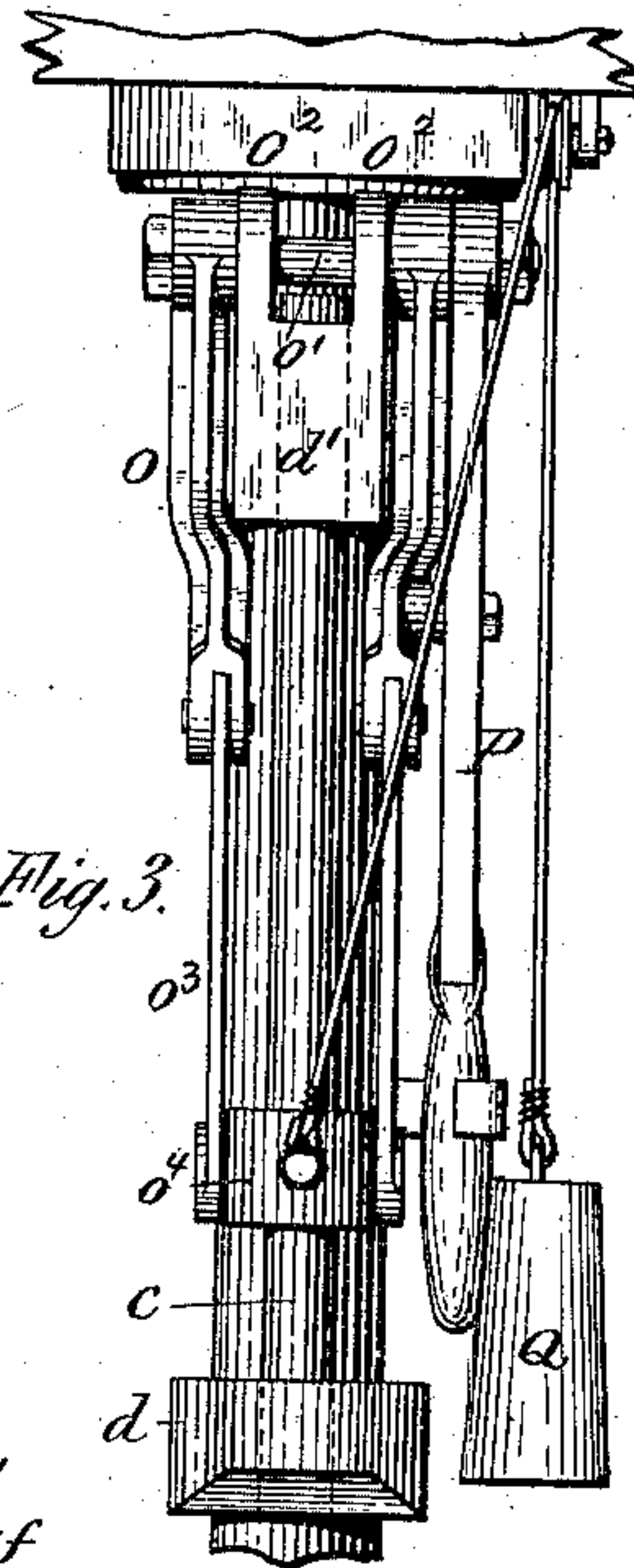


Fig. 3.

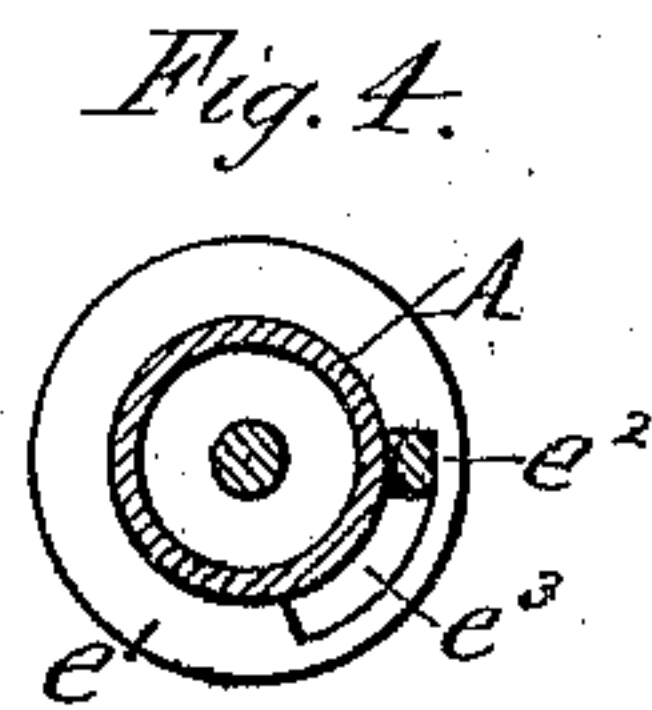


Fig. 4.

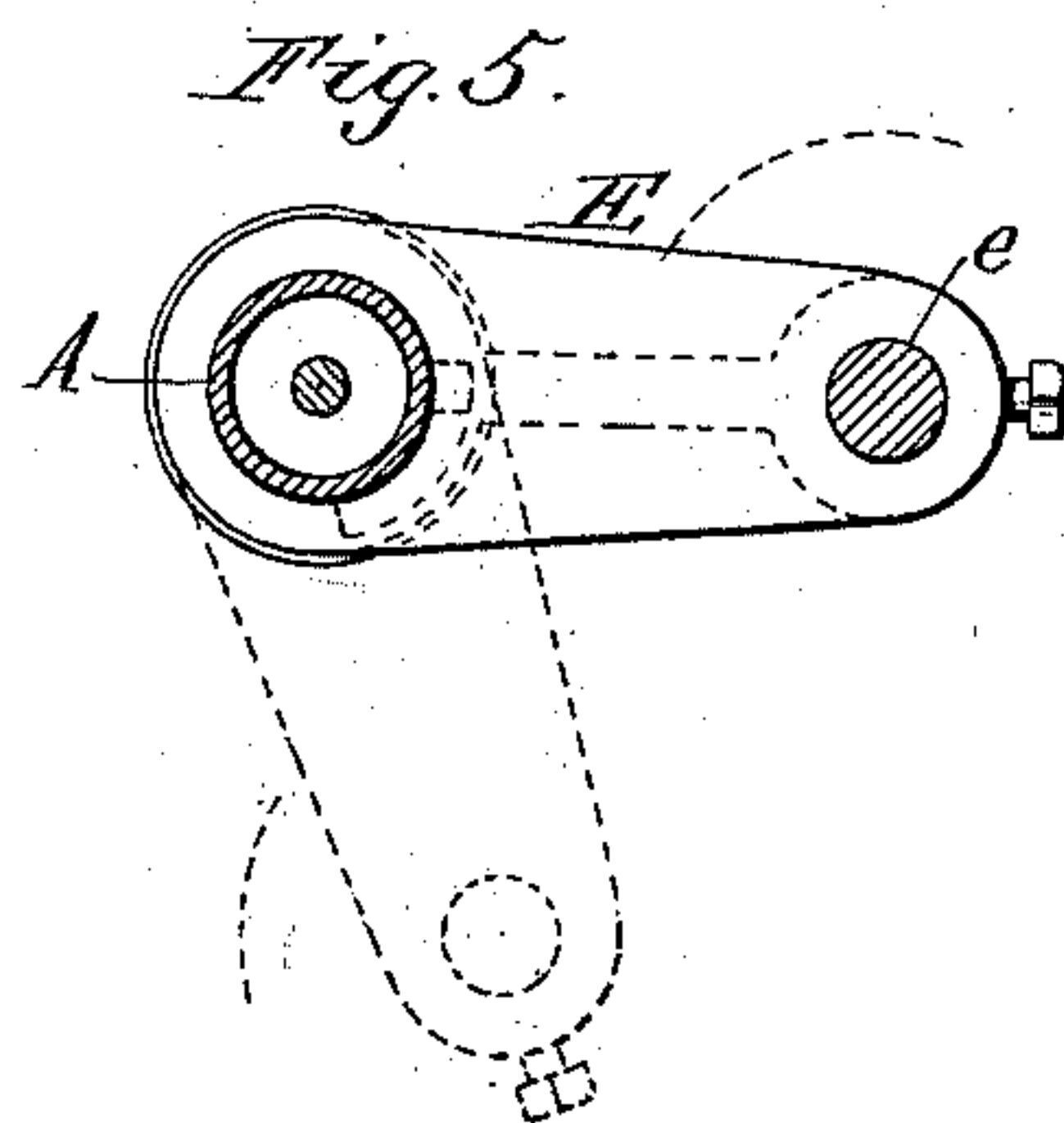


Fig. 5.

Chas. J. Buchheit  
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Witnesses.

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(No Model.)

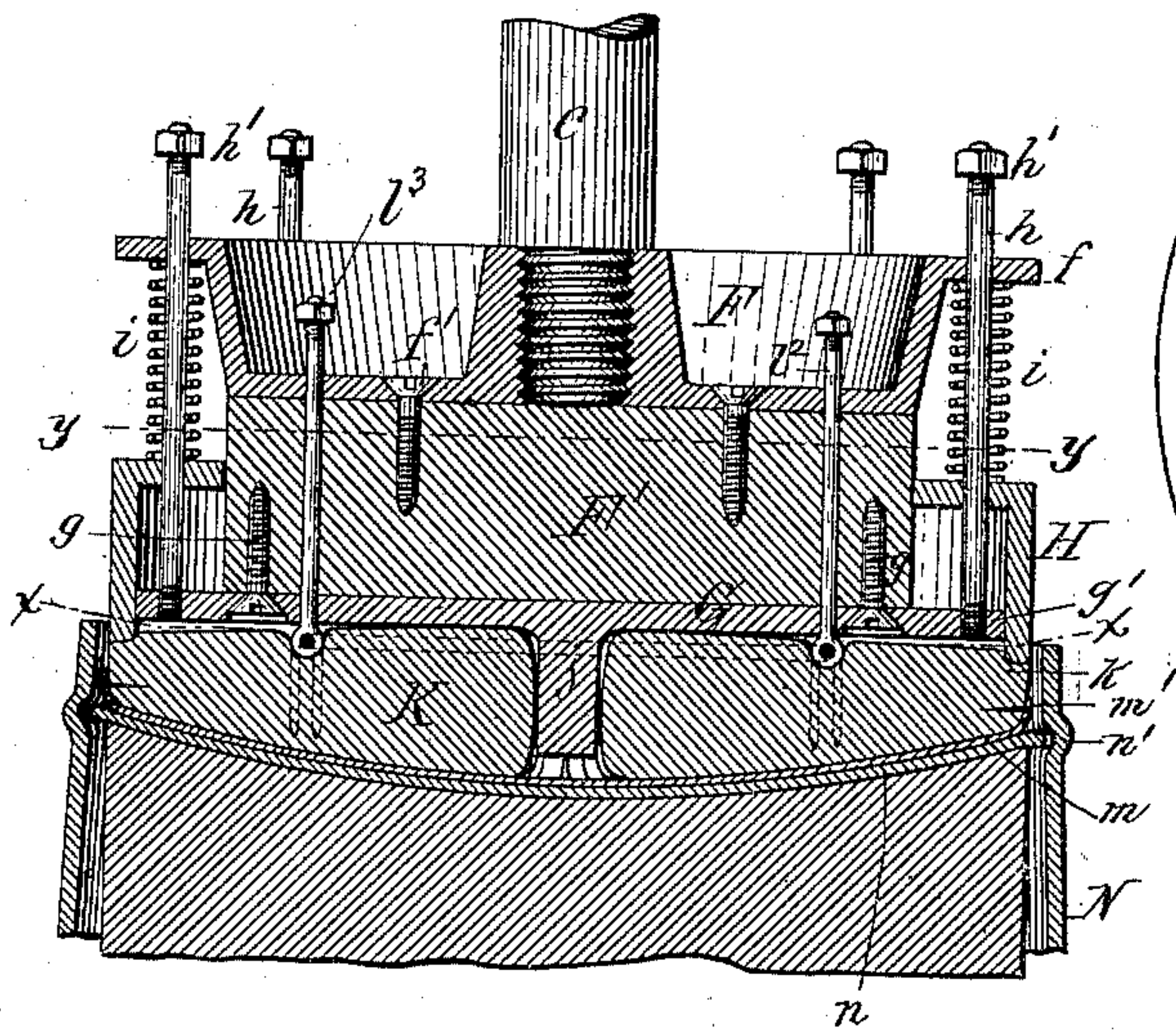
2 Sheets—Sheet 2.

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Fig. 6



*Fig. 7.*

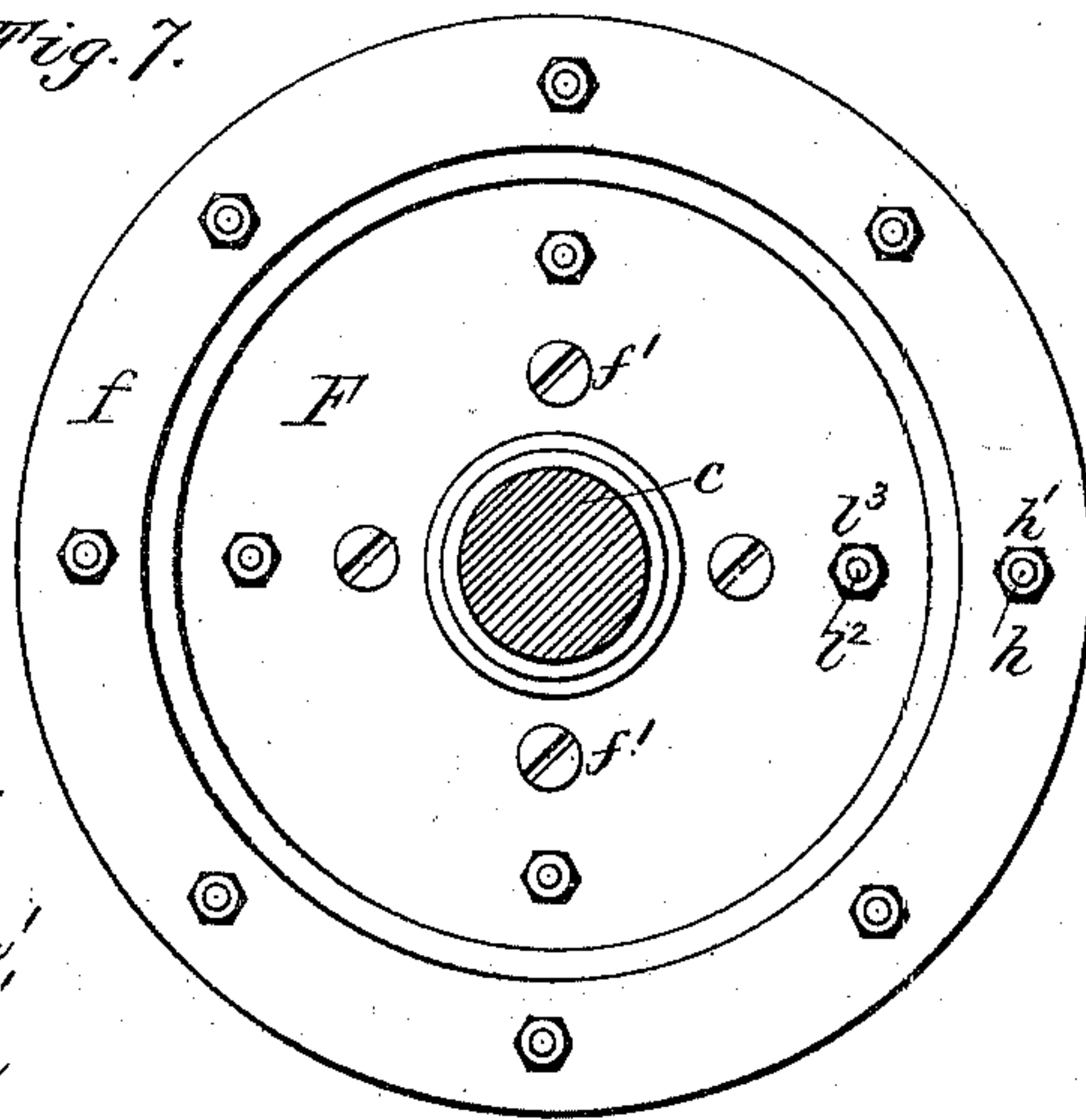
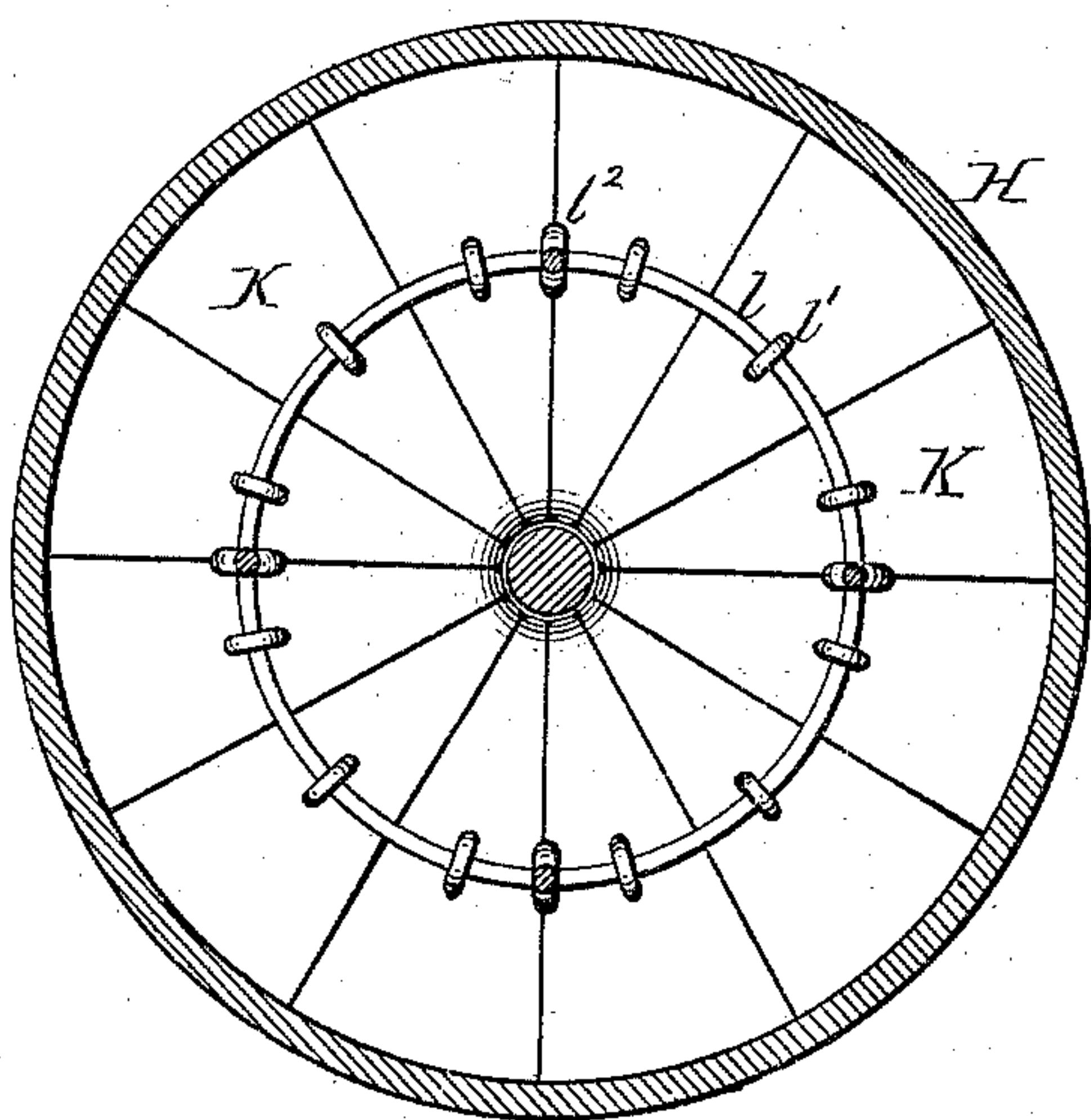


Fig. 8.



*Fig. 9.*

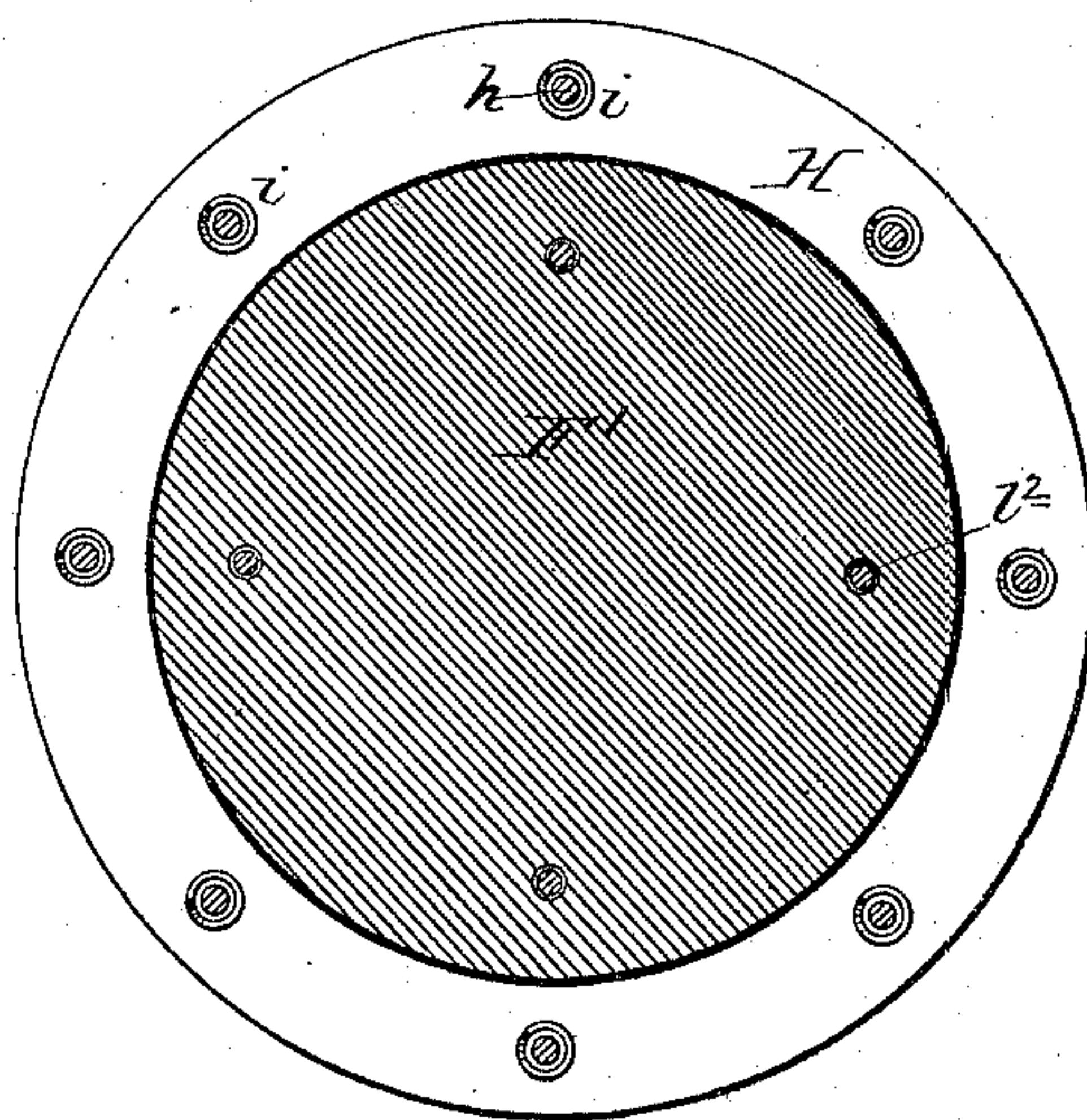
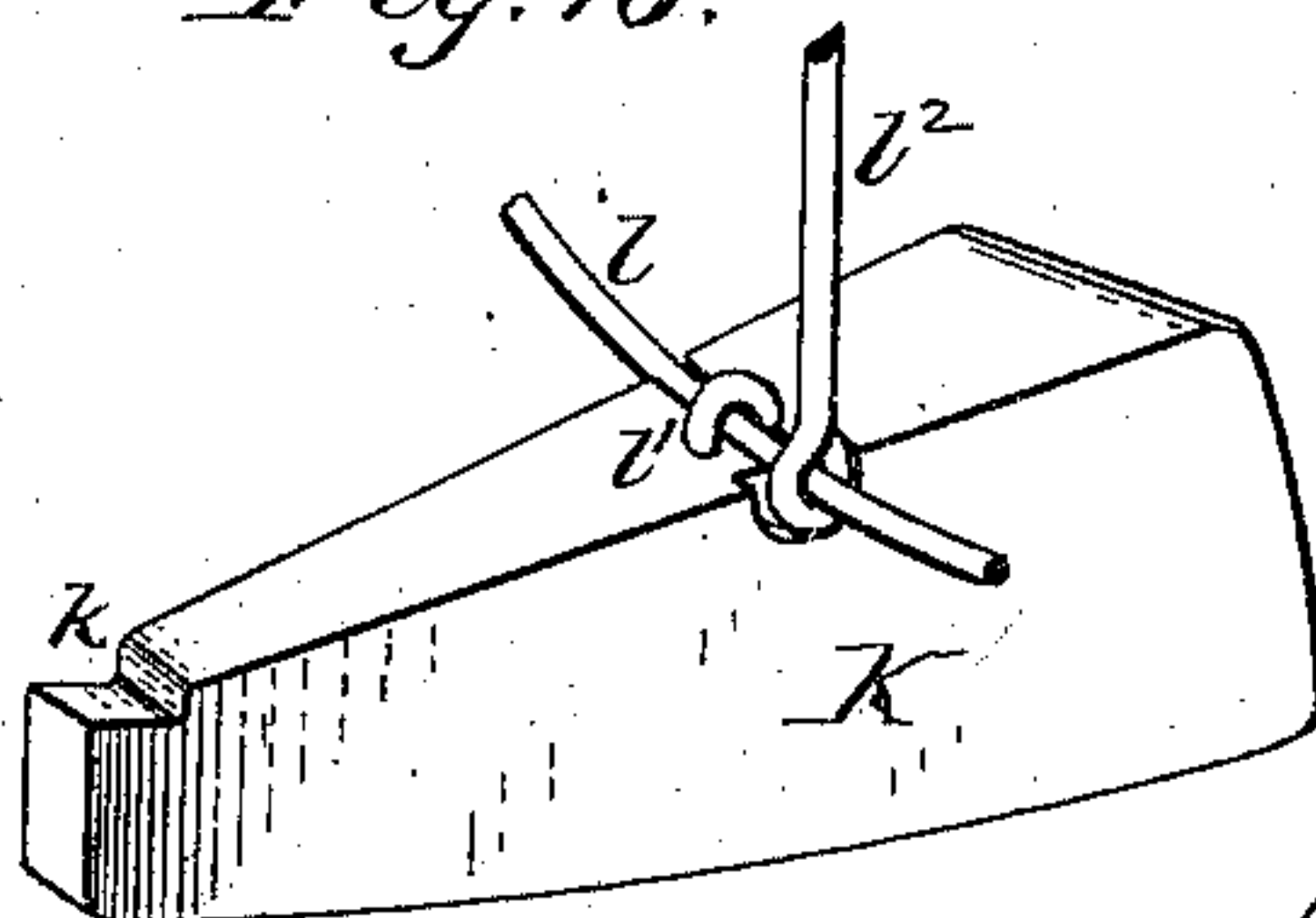


Fig. 10.



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# UNITED STATES PATENT OFFICE.

HENRY W. LEONARD, OF SYRACUSE, AND JOHN STEVENS, OF PORT BYRON,  
ASSIGNORS TO THE SYRACUSE FIBRE WARE COMPANY, OF SYRACUSE,  
NEW YORK.

## MACHINE FOR BENDING PAIL-BOTTOMS.

SPECIFICATION forming part of Letters Patent No. 335,079, dated January 26, 1886.

Application filed July 21, 1884. Serial No. 138,384. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY W. LEONARD and JOHN STEVENS, residing, respectively, at Syracuse, in the county of Onondaga and State of New York, and Port Byron, in the county of Cayuga and State of New York, have invented new and useful Improvements in Machines for Bending Pail-Bottoms, of which the following is a specification.

The object of this invention is to produce a machine whereby the bottoms can be attached to pails constructed of paper-pulp or similar material. These pails are provided near their lower edges, on their inner sides, with an annular depression or groove, which receives the edge of the bottom. The latter is constructed of straw-board, pasteboard, or similar material, and in order to introduce it into the groove of the pail the bottom must be sprung or bent to such an extent that the pail can be slipped over the bottom until the edges of the latter enter the groove of the pail, when, by releasing the bottom, the latter is permitted to expand and seat itself in the groove of the pail.

Our improved machine is designed to bend or spring the bottom preparatory to inserting it into the groove of the pail; and our invention consists of the improvements in the construction of the machine which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a side elevation, and Fig. 2 a sectional elevation, of our improved machine. Fig. 3 is a front elevation of the upper part of the machine. Figs. 4 and 5 are horizontal sections in lines  $xx$  and  $yy$ , Fig. 2, respectively. Fig. 6 is a sectional elevation of the follower and support by which the bottom is bent. Fig. 7 is a top plan view of the follower. Figs. 8 and 9 are horizontal sections in lines  $xx$  and  $yy$ , Fig. 6, respectively. Fig. 10 is a perspective view of one of the pressure-sections of the follower.

Like letters of reference refer to like parts in the several figures.

A represents the standard or column to

which the operative parts of the machine are attached, and which consists of a tube,  $a$ , and heads  $a'$   $a^2$ , secured together by a tie-rod,  $a^3$ .

B represents the support on which the bottom is placed, and C the follower, which operates in conjunction with the support B in bending the bottom.

$c$  represents a rod or stem, to the lower end of which the follower C is attached, and which is guided in brackets or supports  $d$   $d'$ , which are secured to the column A.

The support B is provided on its upper side with a concave recess,  $b$ , into which the bottom is forced by the follower C.

$e$  represents a rod extending downwardly from the support B and secured in a bracket, E, which is attached to the column A and rests upon a collar,  $e'$ , secured to the column, so that the bracket E and support B, attached thereto, can be turned on the column, in order to bring the support B underneath the follower C or move it from under the follower, as may be desired.

$e^2$  is a stop or projection formed on the lower side of the bracket E and projecting into a segment,  $e^3$ , formed in the upper side of the collar  $e'$ , so as to limit the swinging movement of the bracket E on the column A.

F represents a dished head secured to the lower end of the rod  $c$ , and provided at its upper edge with a marginal flange,  $f$ .

F' represents a downward continuation of the head F, secured to the lower side of the latter by screws  $f'$ .

G represents a circular plate secured to the lower side of the head F' by screws  $g$ , and provided with a marginal flange,  $g'$ , projecting beyond the edge of the head F.

H represents an angular collar surrounding the head F and the plate G.

$h$  represent vertical rods secured with their lower ends in the marginal flange  $g'$  of the plate G and passing loosely through the horizontal portion of the angular collar and through the marginal flange  $f$  of the head F. The rods  $h$  are provided above the flange  $f$  with screw-nuts  $h'$ , which are so adjusted on the rods  $h$  that they will bear against the flange  $f$  when



the follower C is elevated, as represented in Fig. 2.

*i* represent spiral or other suitable springs interposed between the flange *f* and the ring H.

5 *j* represents a pin formed centrally on the lower side of the plate G.

K represent the movable pressure-sections, arranged on the lower side of the plate G around the pin *j*, and resting with their outer  
10 ends at *k* against the lower edge of the ring H.

*l* represents a ring, of wire or other suitable material, arranged on the sections K, and attached to the latter by staples *l'*.

15 *l'* are bolts attached to the ring *l* and extending upwardly through the plate G and head F, and provided above the latter with screw-nuts *l''*, which are so adjusted that they will rest on the head F when the follower C is in  
20 an elevated position, as represented in Fig. 2.

*m* represents a covering, of rubber, leather, or other flexible material, extending over the lower surface of the sections K, and secured with its outer edge to the outer sides thereof,  
25 as indicated at *m'* in Fig. 6.

*n* represents the bottom resting on the support B, and N represents the pail provided near its lower edge with an annular groove or depression, *n'*.

30 O represent toggle-levers secured to a horizontal shaft, *o'*, which is supported in bearings *o''*, formed on the upper bracket, *d*.

*o'''* represent links which connect the toggle-levers O with a sleeve, *o''''*, secured to the rod *c*.

35 P represents a hand-lever secured to the shaft *o'*, for raising and lowering the follower C by means of the toggle-bars.

Q represents a weight, which is attached to the sleeve *o''''* by a cord, *q*, running around  
40 rollers *q'*, and which serves to elevate the follower C when the hand-lever P is released.

When the follower C is in its elevated position, as represented in Fig. 2, the springs *i* hold the ring H down against the flange *g'* of  
45 the plate G, whereby the outer ends of the pressure-segments K are depressed and their inner ends are elevated, as clearly shown in Fig. 2.

In order to apply the bottom and pail to the  
50 support B, the latter is swung away from under the follower C, as represented by dotted lines in Fig. 5. The bottom is then placed on the support B and the pail slipped over the support and bottom as far as it will go, as  
55 represented in Fig. 2. In this position of the parts the groove *n'* is located above the bottom *n*. The support B is now swung under the follower C, and the latter is lowered by moving the hand-lever P forward. The fol-  
60 lower C is smaller than the small end of the pail and enters the same. As the outer ends of the pressure-sections are lower than their inner ends, the follower comes in contact with the bottom *n* near its periphery. As the down-  
65 ward movement of the follower C continues,

the head F compresses the springs *i*, the ring H being held against further downward movement by the contact of the outer ends of the pressure-sections with the pail-bottom. The heads F F' and plate G now move downwardly  
70 within the ring H, whereby the inner ends of the pressure-sections are gradually forced downwardly until finally the entire lower surfaces of the pressure-sections come in contact with the pail-bottom and press the same into  
75 the concave recess *b* in the upper side of the support B, as represented in Fig. 6. The lower sides of the pressure-sections are made convex, to correspond with the concave form of the recess *b*. In this manner the pail-bot-  
80 tom is pressed or bent gradually from its periphery toward its center, whereby the desired curved form is imparted to the bottom without causing the bottom to become wrinkled or puckered.

When the bottom has been bent as shown  
85 in Fig. 6, its diameter is reduced to such an extent that the pail can be slipped down so as to engage with its groove *n'* over the edge of the bottom. The follower C is now raised,  
90 whereby the bottom is permitted to spring outwardly and expand sufficiently to seat itself firmly in the groove of the pail, while retaining a certain curvature, which renders the bot-  
95 tom strong and rigid. The support B is now swung away from under the follower, and the pail, with the bottom secured therein, is lifted from the support, when the latter is ready for another operation.

The flexible covering *m* covers the joints  
100 between the several pressure-sections K, and forms a smooth convex surface when the follower C is pressed against the pail-bottom.

We claim as our invention—

1. In a machine for bending pail-bottoms,  
105 the combination, with a concave support, B, of a follower, C, provided with movable pressure-sections adapted to come in contact with the bottom near its periphery, and to gradually close against the bottom from its  
110 periphery toward its center, substantially as set forth.

2. In a machine for bending pail-bottoms, the combination, with a concave head-support,  
115 of a follower provided with movable convex pressure-sections, substantially as set forth.

3. In a machine for bending pail-bottoms, the combination, with a concave support, B,  
120 of a follower, C, provided with movable pressure-sections K and a flexible covering, *m*, substantially as set forth.

4. In a machine for bending pail-bottoms, a follower composed of the heads F F' G, mov-  
125 able ring H, interposed springs *i*, rod *h*, and pressure-sections K, attached loosely to said head, substantially as set forth.

5. In a follower, the combination, with the heads F F' G, of the movable ring H, rods *h*,  
springs *i*, pressure-sections K, ring *l*, and rods  
130 *l'*, substantially as set forth.

6. The combination, with the standard A  
and follower C, of the concave support B,  
bracket E, turning on said standard, and a stop  
whereby the movement of the bracket on the  
5 standard is limited, substantially as set forth.

7. The combination, with the standard A,  
provided with guides *d d'*, and the concave  
support B, of the follower C, attached to the

rod *c*, toggle-bars *O o'*, and hand-lever P, sub-  
stantially as set forth.

Witness our hands this 7th day of May, 1884. 10

HENRY W. LEONARD.

JOHN STEVENS.

Witnesses:

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EDWARD C. WARD.