

(No Model.)

2 Sheets—Sheet 1.

J. M. ELLIS.

MACHINE FOR CAPPING NAILS.

No. 336,994.

Patented Mar. 2, 1886.

Fig 1

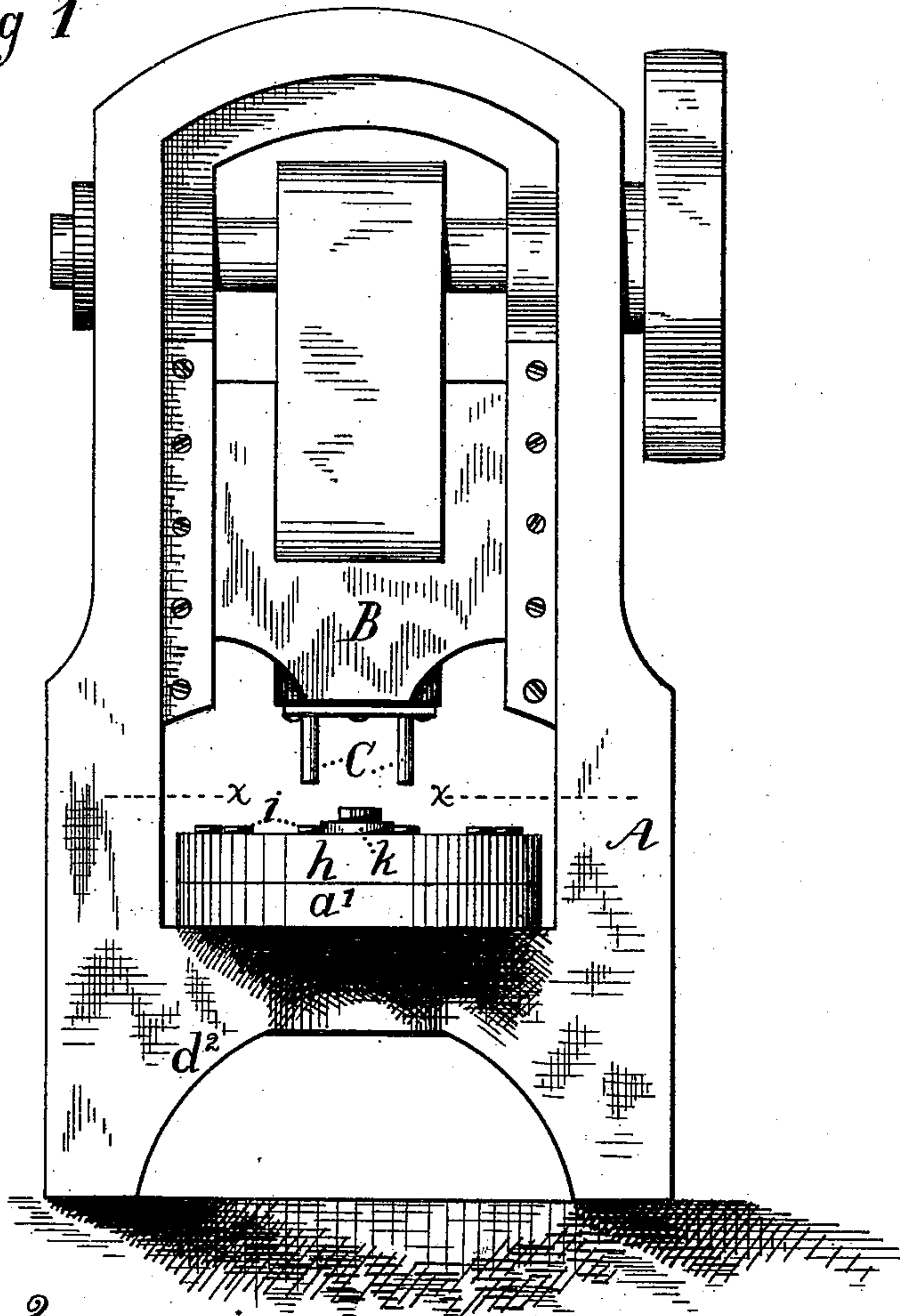
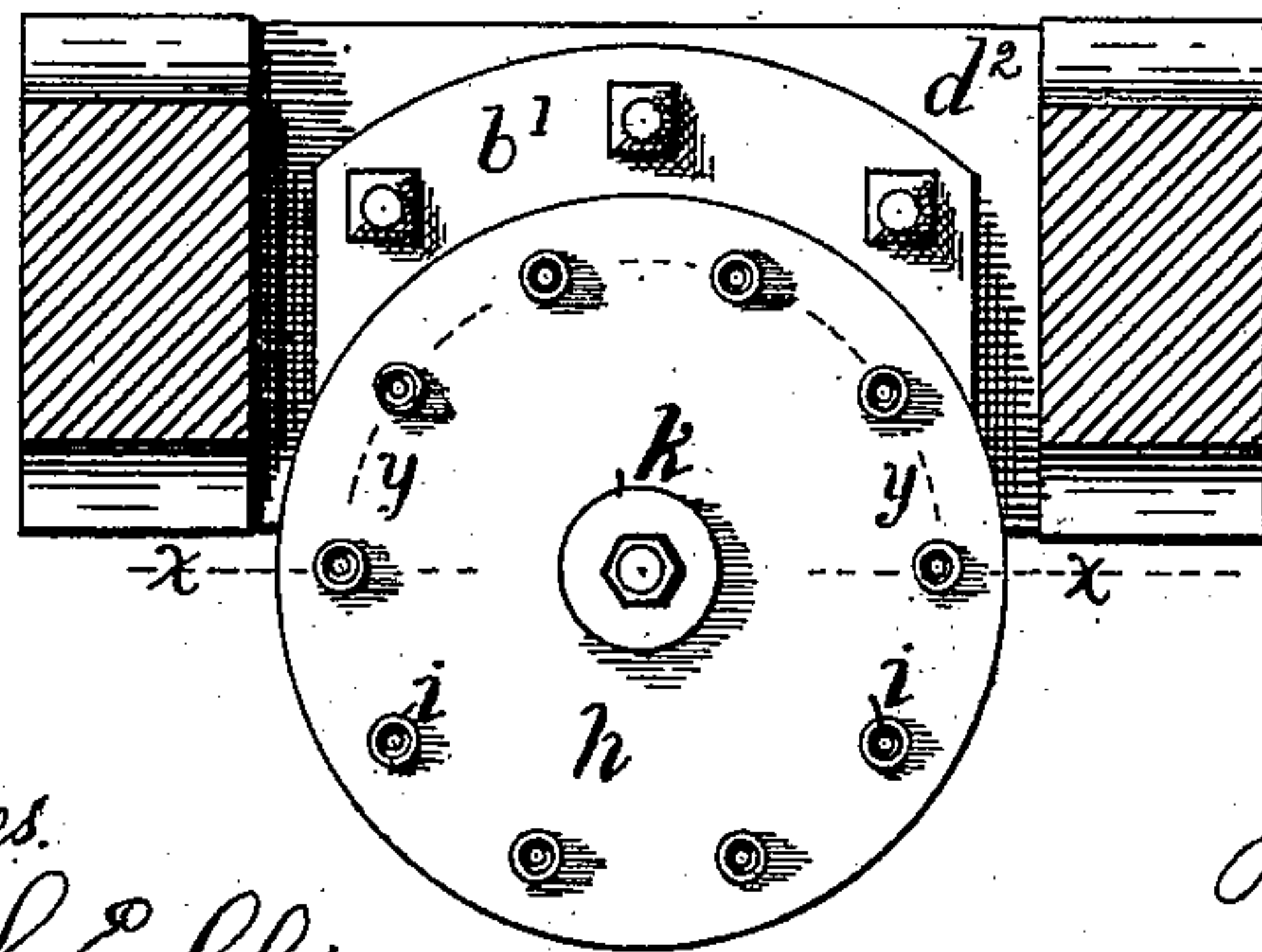


Fig. 2



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Fig. 3

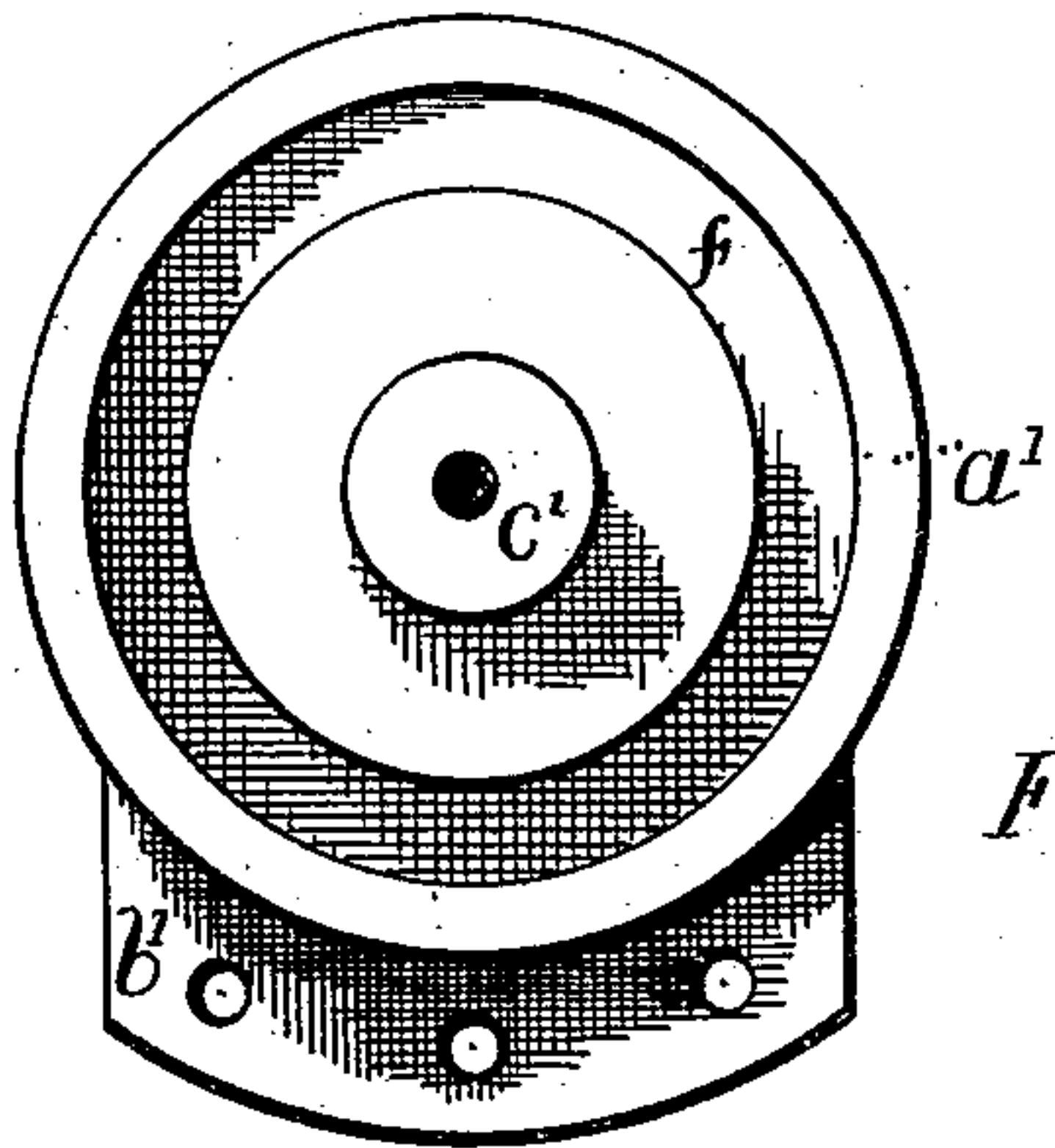


Fig. 4

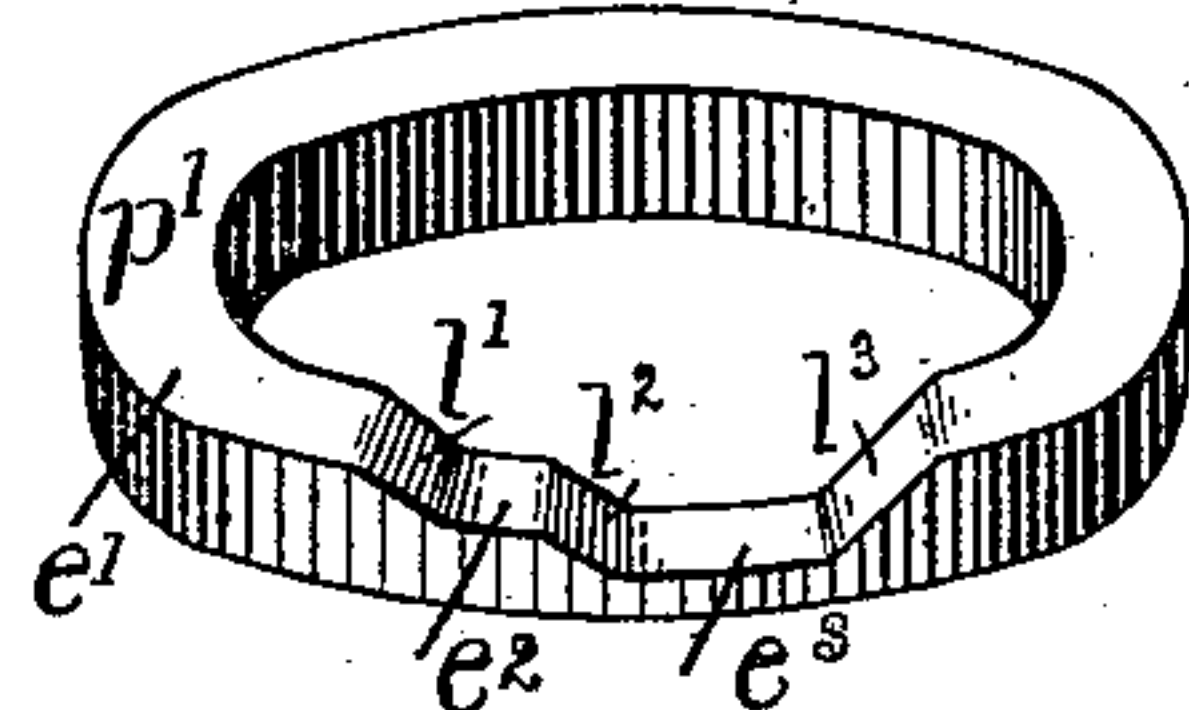


Fig. 5

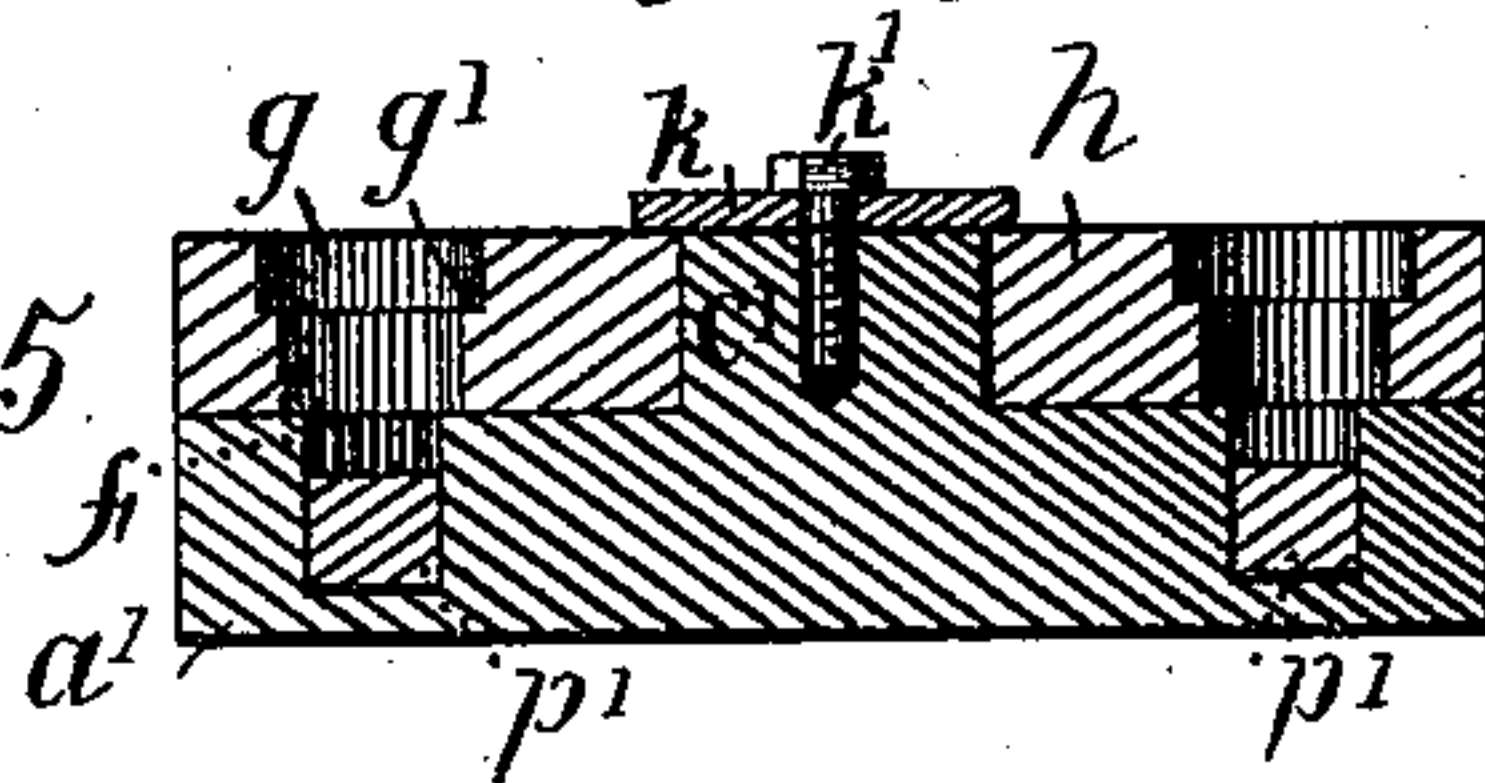


Fig. 6

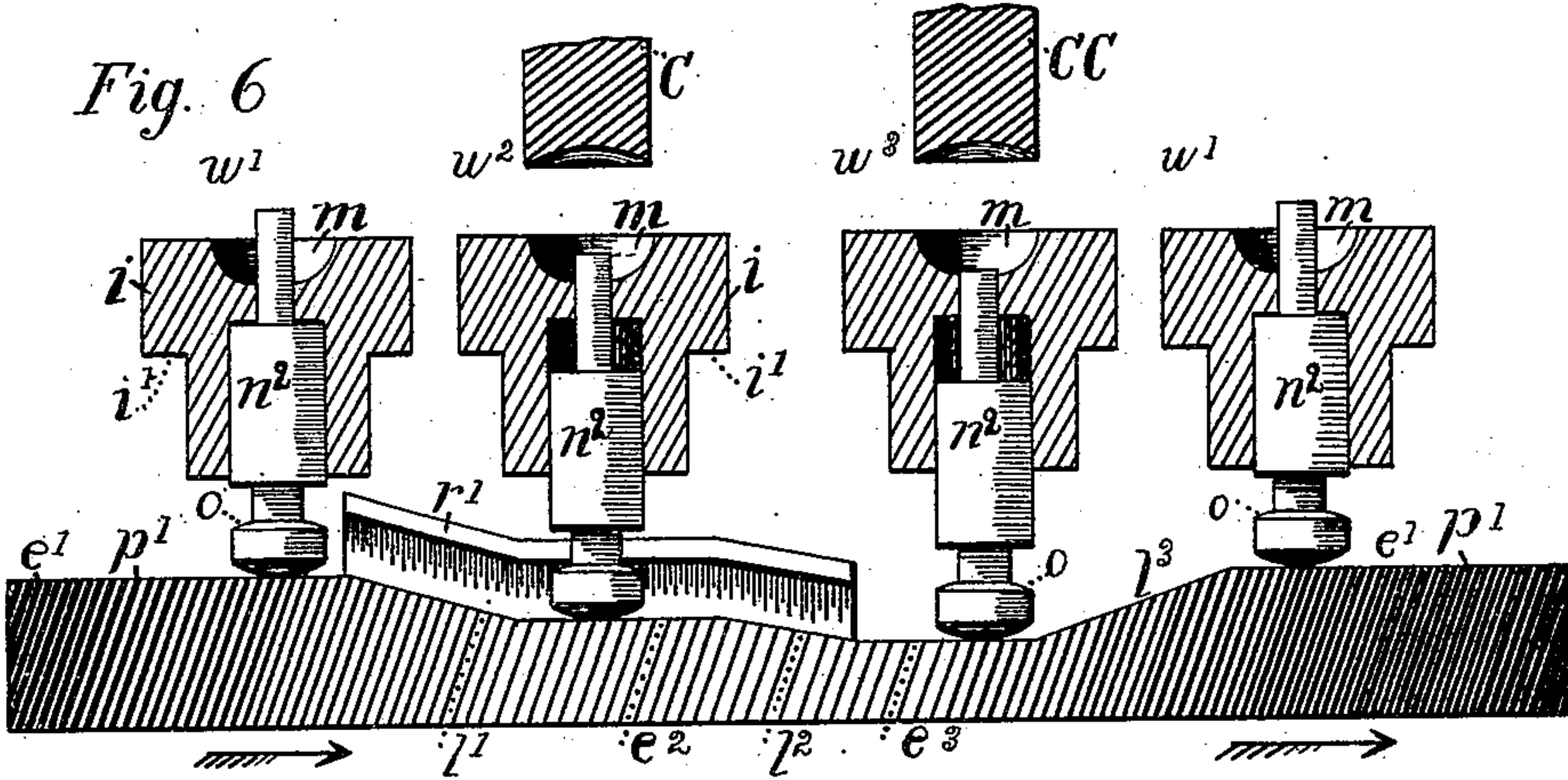


Fig. 7

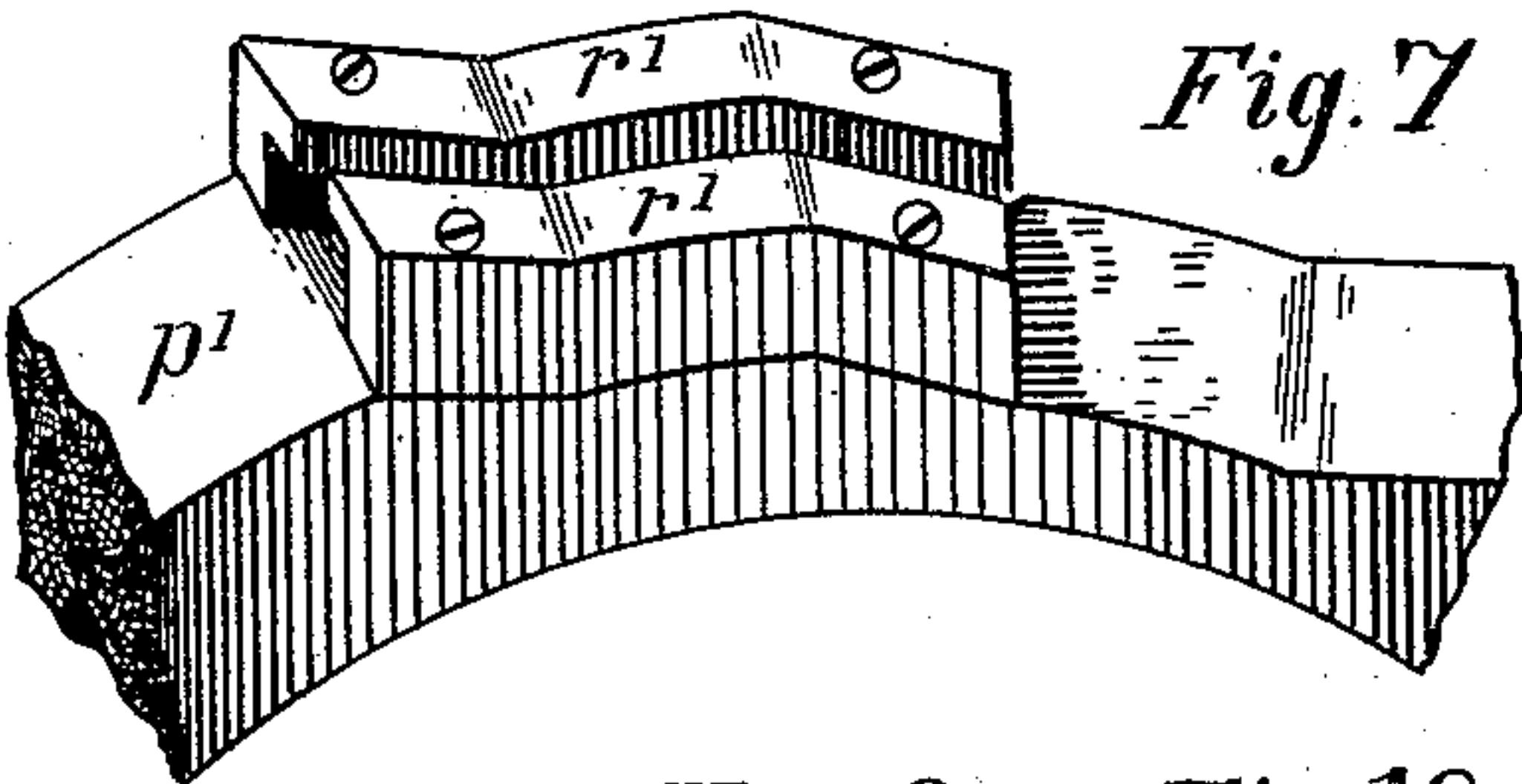


Fig. 8

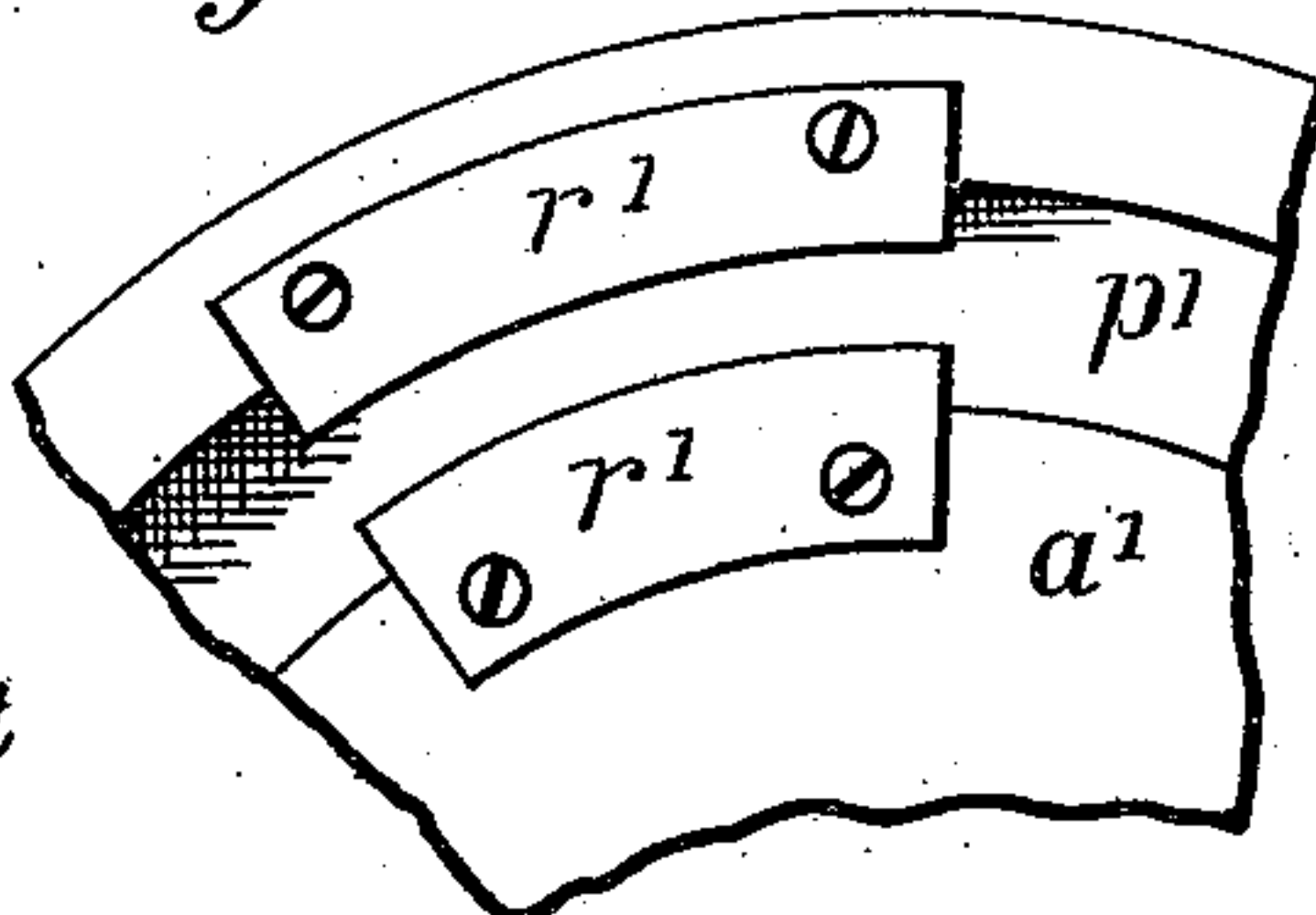
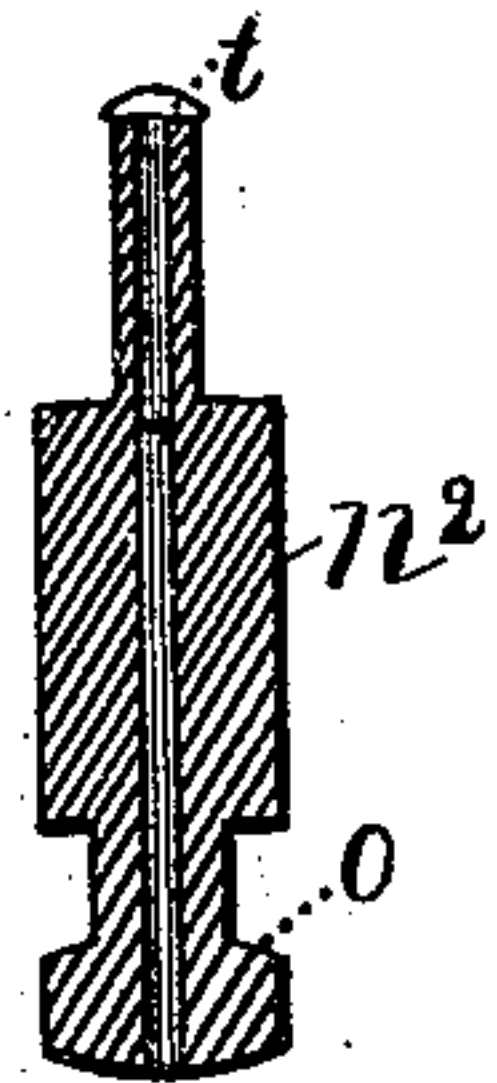
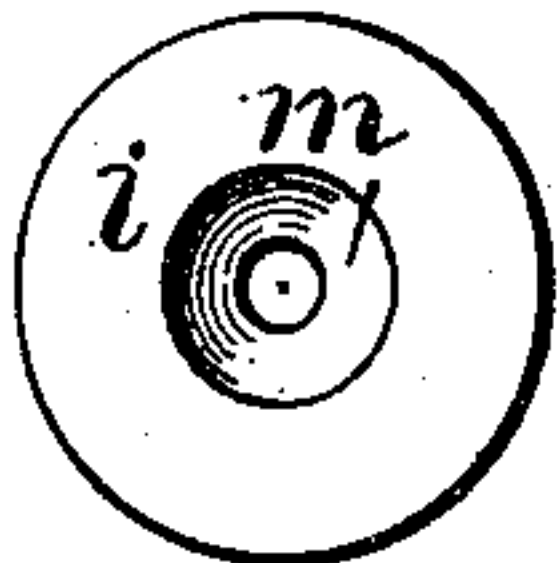


Fig. 9 Fig. 10



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# UNITED STATES PATENT OFFICE.

JAMES M. ELLIS, OF NEW HAVEN, CONNECTICUT.

## MACHINE FOR CAPPING NAILS.

SPECIFICATION forming part of Letters Patent No. 336,994, dated March 2, 1886.

Application filed August 27, 1885. Serial No. 175,508. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. ELLIS, of New Haven, in the State of Connecticut, have invented a new and useful Improvement in  
5 Machines for Capping Nails, of which the following is a specification.

The object of my invention is to provide a press for forming and attaching ornamental heads of leather or other soft substance to  
10 nails and similar articles.

The invention consists in an arrangement of novel cams and dies for shaping and compressing a head upon and around the nail shank and flange, and in the novel construction of  
15 parts, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1 shows a simple press fitted with my improvements. Fig. 2 is a horizontal section on the  
20 line  $x x$ , Fig. 1, showing a plan view of the die-plate and dies. Fig. 3 is a plan view of the press-bed. Fig. 4 shows a cam for operating the nail-holders. Fig. 5 is a vertical section through the bed and die-plate on the  
25 line  $x x$ , Fig. 2. Fig. 6 is a vertical circular section through the cam and dies on the line  $y y$ , Fig. 2. Figs. 7 and 8 show modifications of the depressing-guides. Fig. 9 shows a plan of a shaping-die, and Fig. 10 shows a nail-holder in vertical section with a nail inserted.

Referring to the drawings, A denotes an upright press, in which a punch-head, B, reciprocates, operated by an ordinary eccentric-shaft and connecting-rod. The press-bed  $a'$  is  
35 circular, and has a flange,  $b'$ , by which it is bolted rigidly to the horizontal part  $d^2$  of the frame, with one side vertically under the punch-head and punches, as shown. At the center of the bed, on its upper side, is a vertical cylindrical projection or bearing,  $C'$ , and concentric with the bearing is an annular  
40 groove,  $f$ , formed in the bed near its edge. The bed supports a revolving die-plate,  $h$ , journaled upon the central bearing,  $C'$ , and secured by a cap,  $k$ , which is bolted to the bearing by a screw,  $k'$ . The die-plate carries a series of shaping-dies,  $i$ , arranged in cylindrical  
45 seats  $g$ , which are bored vertically through the plate concentric with its axis and equidistant from each other. The lower part of each shaping-die is reduced in diameter to form an annular shoulder,  $i'$ , which rests on a corresponding seat,  $g'$ , in the die-plate, and the bot-

tom of the die also bears on the press-bed  $a'$  at the edges of the groove  $f$ . Each die has a  
55 central cup-shaped depression,  $m$ , in its upper face, for forming the nail-head, and is perforated axially to receive a vertically-reciprocating holder,  $n^2$ . The reciprocating holder is perforated lengthwise to receive and hold  
60 the nails while their ornamental heads are being formed around the ordinary flanges or heads with which nails are provided. The diameter of the upper part of the nail-holder is slightly smaller than the nail-flange, and the  
65 body of the holder is grooved circumferentially to form a flange,  $O$ , at its lower end. The series of nail-holders project below the die-plate and revolve in the groove  $f$ , with their lower extremities bearing upon an annu-  
70 lar cam,  $p'$ , which is fitted rigidly into the groove, and has a series of inclined surfaces,  $l^1 l^2 l^3$ , on its upper face, and an equal number of horizontal planes,  $e^1 e^2 e^3$ . The middle and lowest level surfaces,  $e^2 e^3$ , of  
75 the cam are located directly under the forming-punches, which are set the same distance apart as the dies and in exact alignment with their path. Suitable stop mechanism (not shown) is arranged to arrest the dies coinci-  
80 dent with the punches, and when the press is to be worked automatically a pawl and ratchet or other suitable device may be used to revolve the die-plate  $h$  from stop to stop. As the die-plate  $h$  revolves, the nail-holders  $n^2$   
85 slide along on the surface of the cam  $p'$ , and are moved vertically in passing over the inclined surfaces thereof. The die-plate revolves and carries the dies in the direction shown by the arrows with reference to the cam. While  
90 moving over the highest level part  $e^1$  of the cam, the nail-holders  $n^2$  project above the surface of the shaping-dies  $i'$ , as shown at  $w^1 w'$ , Fig. 6. After descending the incline  $l^1$ , each nail-holder rests stationary on the level sur-  
95 face  $e^2$ , with its upper end near the middle of the depression  $m$  and exactly under the punch C, as shown at  $w^2$ , same figure. While passing to the next punch, C C, the holder descends the incline  $l^2$  and rests on the level surface  $e^3$   
100 with its upper end coincident or flush with the bottom of the depression  $m$ , as shown at  $w^3$ . After leaving the second punch the holders rise by one incline,  $l^3$ , to the highest part of the cam, and move around the front  
105 side of the press with their upper ends pro-



jecting above the shaping-dies. The incline  $l^3$  may be made much more sloping than that shown, and, if desired, may extend nearly half-way around the cam.

5 To insure the descent of the holders  $n^2$  when passing the inclines  $l^2$ , two depressing guides,  $r'$ , are arranged over the inclines, parallel therewith, and project over the path of the flanges O on the holders. As the flanges O  
10 engage with and move along the under side of the depressing guides the holders are thereby forced downward. The guides  $r'$  may be secured to the annular cam  $p'$ , as shown in Fig. 7, or may be fastened directly to the  
15 bed-plate, as shown in Fig. 8.

Constructed as above described and shown, the operation of my improved mechanism is as follows: The die-plate  $h$  is turned intermittently by suitable automatic-feed mechanism, and  
20 the dies are thereby brought successively under the punches, and there held stationary by suitable stop mechanism. While the dies are passing over the highest surface  $e'$  of the cam  $p'$ , the nail-shanks are inserted in the perforations in the nail-holders  $n^2$ , with their  
25 flanges  $t$  slightly overhanging the edges of the holders, as shown in Fig. 10. The nail-holders descend while passing over the incline  $l'$ , and when arrested under the punch  
30 C the nail-flange  $t$  occupies a position near the middle of the depression  $m$  in the shaping-die. At this point the leather or other material for forming the nail-head is laid upon the shaping-die, and as the punch descends the  
35 blank is sheared from the leather and compressed into the depression around the end of the nail-holders  $n^2$  and nail-flange. The upper end of the die being smaller than the head of the nail, the material is compressed under-  
40 neath the edge of the nail-flange, and holds the nail in position after the holding-die is withdrawn. The next move of the die-plate brings the die under the second punch, C C, and withdraws the nail-holder, leaving the nail  
45 hanging in the blank. As the punches again descend, the blank is compressed firmly around and under the nail flange, completely filling the cup-shaped depression  $m$ , and forming a compact and durable head. As the holders  
50 move up the incline  $l^3$ , they are raised, and the finished nail is pushed upward out of the shaping-die in position to be easily removed from the nail-holder. As the finished nail is removed, a nail-shank is put in its place and  
55 the operation is successively repeated. At each blow of the punches one nail-head is partly formed and another is finished. If desired to compress the head more firmly, a third punch may be added and the horizontal plane  
60  $e^3$  correspondingly extended.

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

1. In a machine for forming compressed heads on nails or tacks, a die, in combination  
65 with a nail-holder adapted in the operation of forming the head to be moved through the die, and to recede so as to be substantially flush

with the bottom of the bowl of the die, said holder having an opening to receive the shank of a nail, substantially as and for the purpose  
70 described.

2. In a machine for forming compressed heads on nails or tacks, in combination with a die, a nail-holder adapted to receive and hold the shank of a nail or tack, and means,  
75 substantially as described, for reciprocating the holder with reference to the die, so as to cause its holding end to project above the bottom of the bowl of the die and descend again until substantially flush with the bottom of the  
80 bowl of the die, substantially as and for the purpose described.

3. In a machine for forming compressed heads on nails or tacks, in combination with a die having a cavity to form the head, a movable holder adapted to project at its upper  
85 end through and above the bottom of the cavity of the die, and having such end formed to receive the shank of the nail or tack and support the head thereof, a plunger or moving die, and means for raising the holder so  
90 that its upper end is above the bottom of the cavity of the stationary die before the moving die descends, substantially as and for the purpose described.

4. In a machine for forming compressed heads on nails or tacks, a holder adapted to receive the shank of a nail or tack, in combination with a concave die, through the bottom of which the holder is adapted to be projected and withdrawn, the die being adapted,  
100 in connection with the plunger, to support and shape the material placed on the nail or tack head, substantially as and for the purpose described.

5. In a machine for forming compressed heads on nails or tacks, in combination with a nail-holder for receiving the shank of a nail or tack, a die through which the holder is adapted to be moved, and a moving punch  
110 adapted to cut out the piece of material to be used for the compressed head, said punch having its end so shaped as to act in conjunction with the die to form and compress the head, substantially as and for the purpose described.

6. In combination with the revolving die-plate and the series of dies carried thereby, the series of reciprocating nail-holders adapted to be moved to cause their upper nail-holding  
120 ends to rise and fall with reference to the bottoms of the dies, the stationary circular cam-track below the nail-holders having the horizontal or plane portions  $e'$ ,  $e^2$ , and  $e^3$ , with the intervening inclines  $l'$ ,  $l^2$ ,  $l^3$ , the depressing guides  $r'$ ,  $r''$ , adapted to engage portions of the nail-holders, and the moving head with the two dies or punches, C, C C, substantially as and for the purpose described.

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Witnesses:

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