

(No Model.)

3 Sheets—Sheet 1.

F. H. RICHARDS.
BUTTON SETTING MACHINE.

No. 330,925.

Patented Nov. 24, 1885.

Fig. 1.

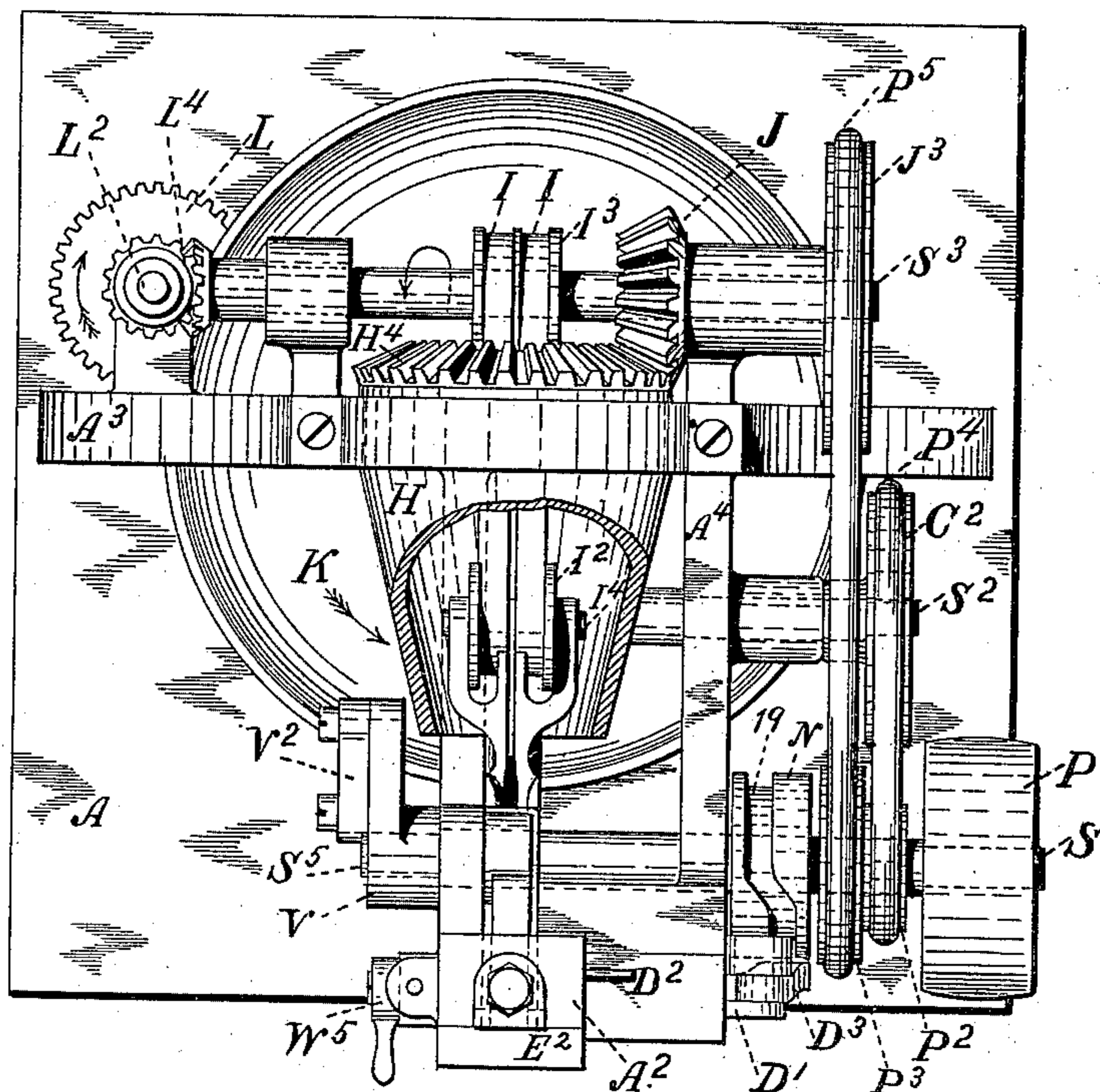


Fig. 2.

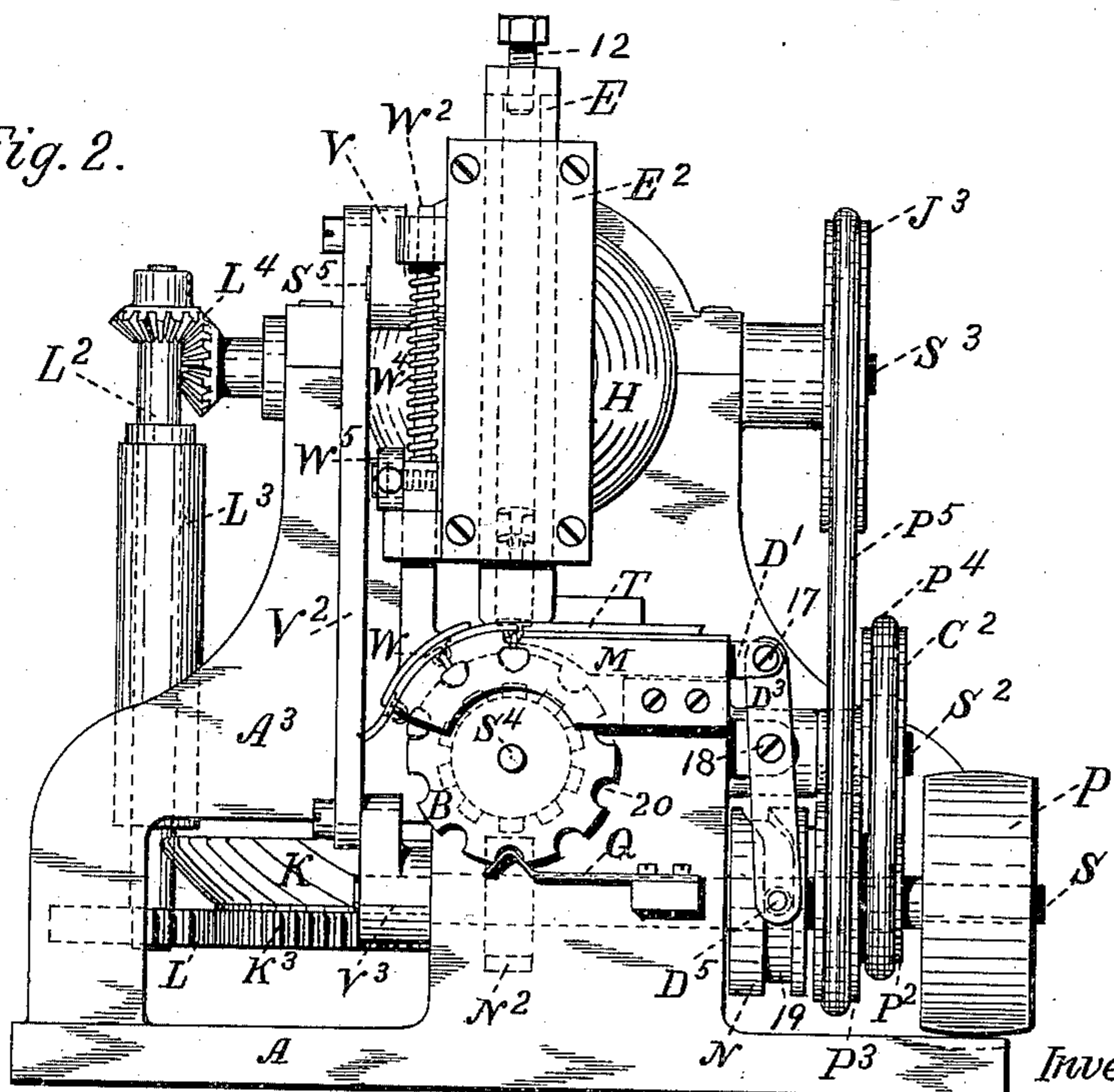
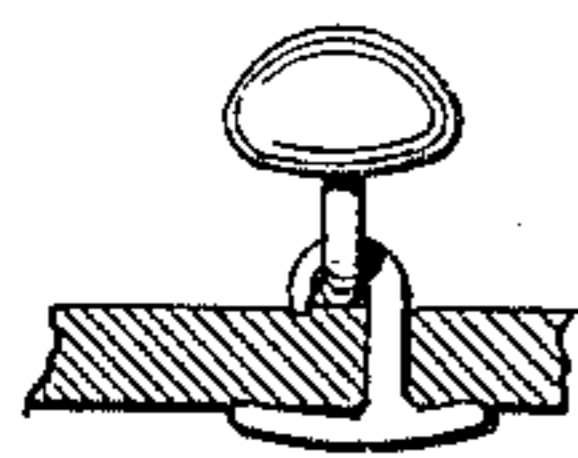


Fig. 16.



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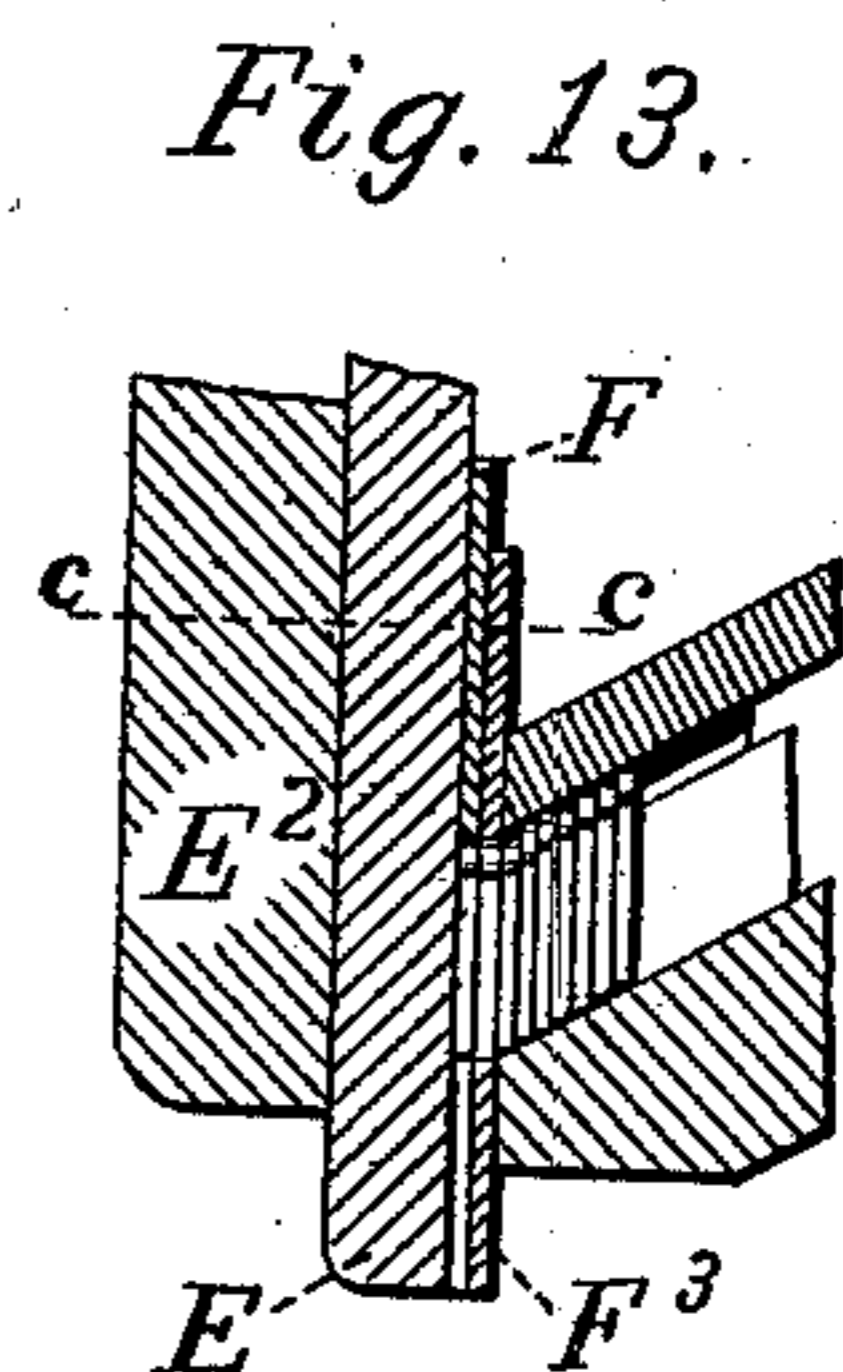
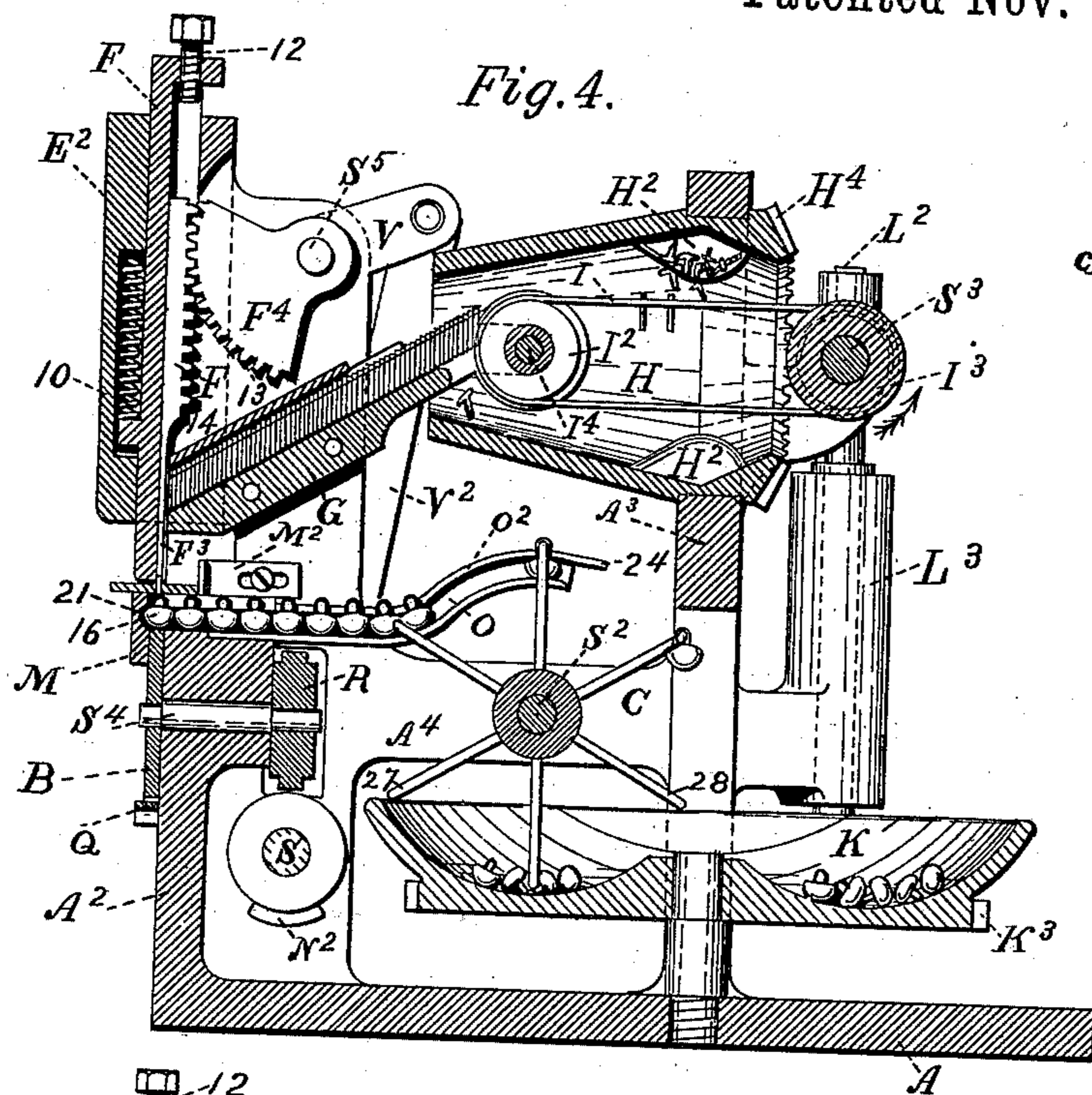
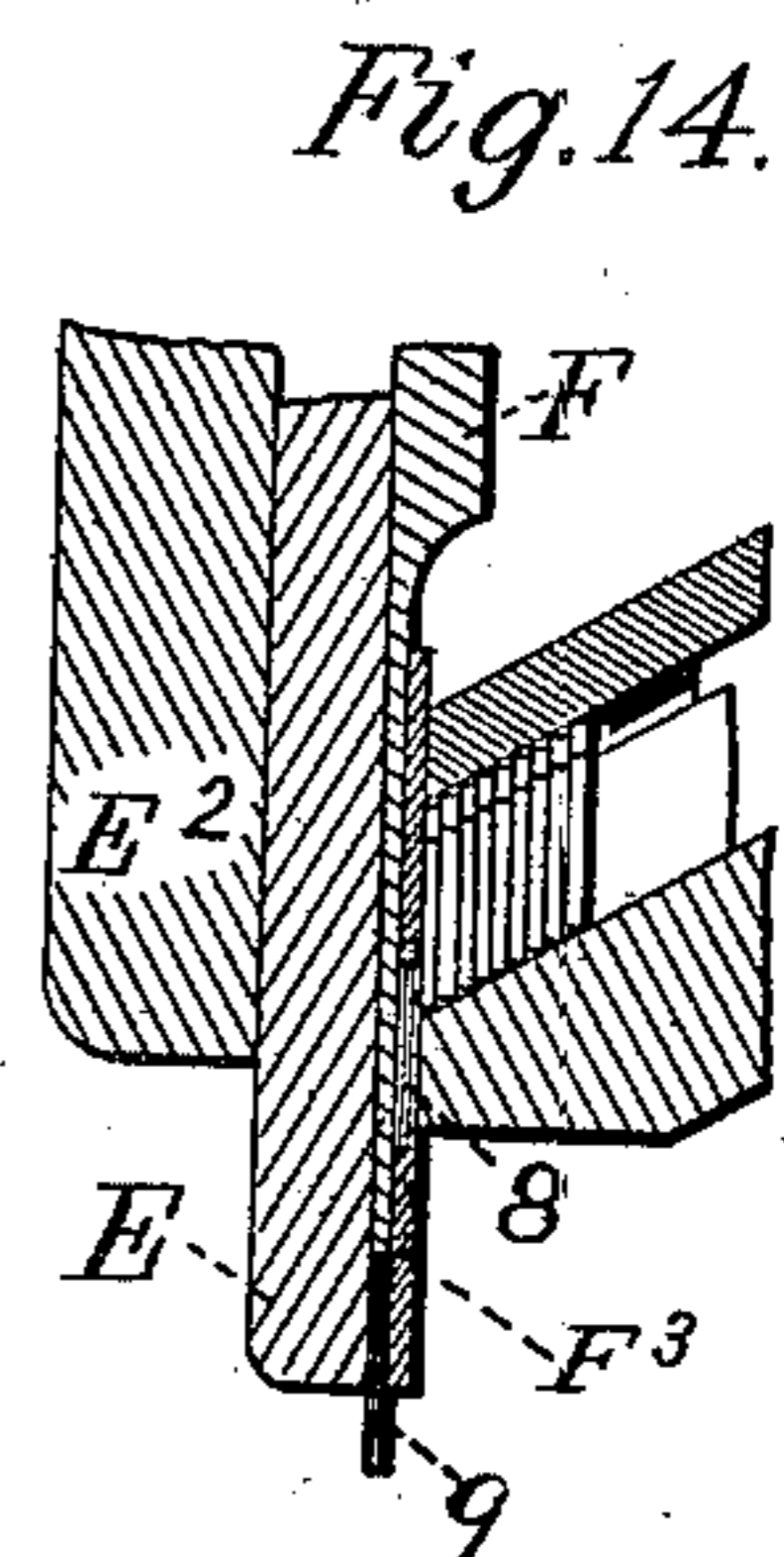
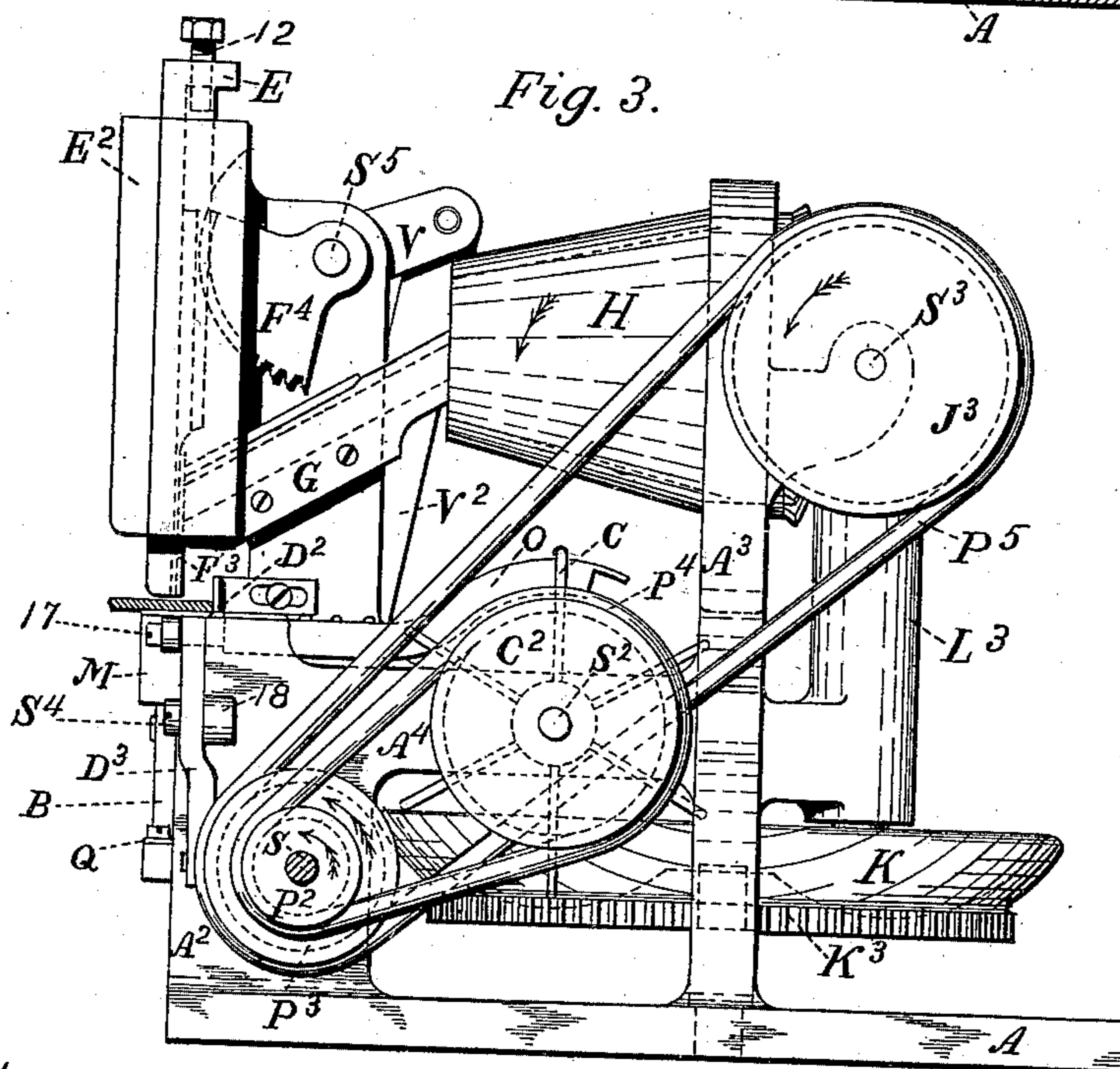


Fig. 15.



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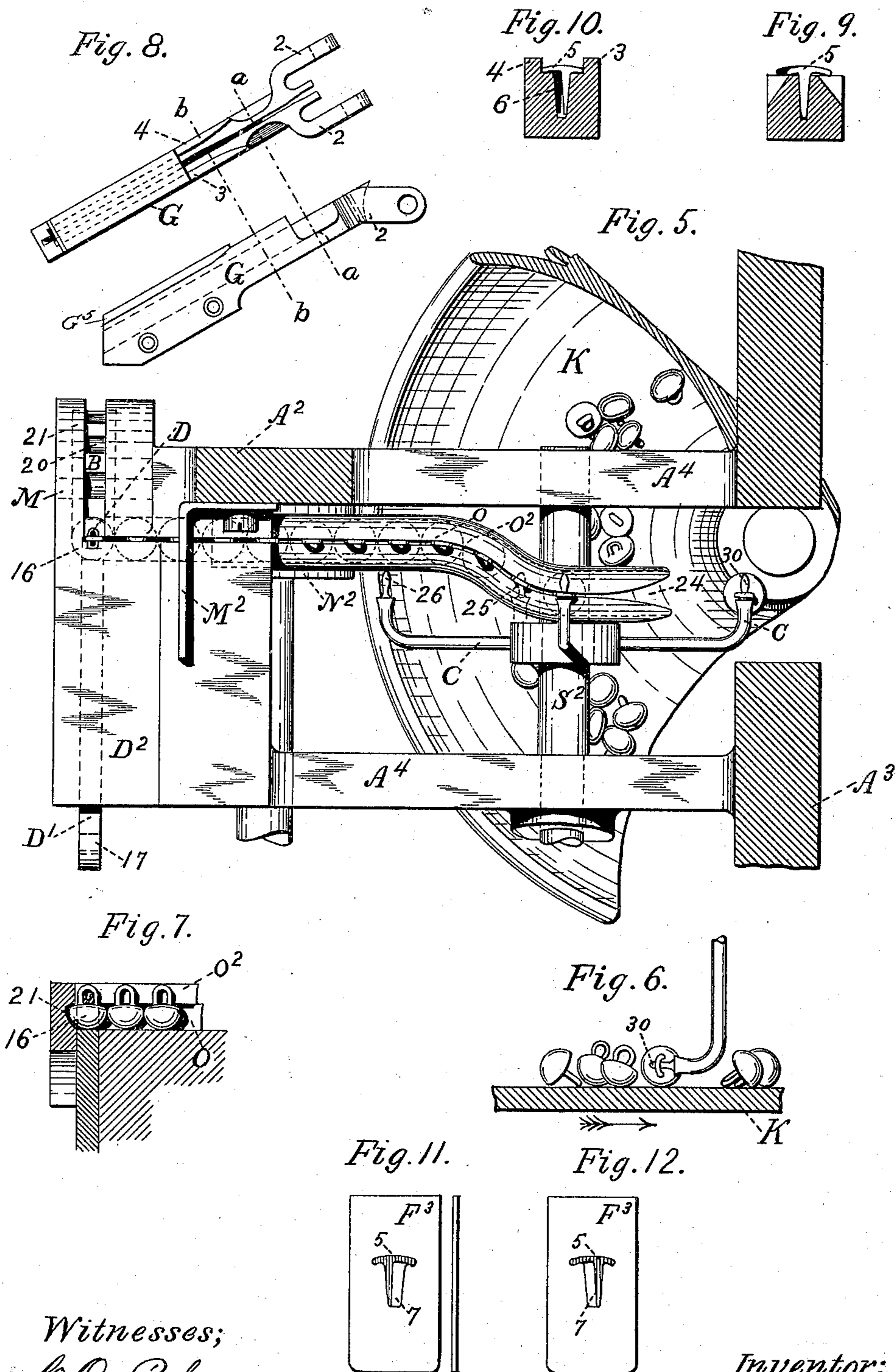
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3 Sheets—Sheet 3.

F. H. RICHARDS.
BUTTON SETTING MACHINE.

No. 330,925.

Patented Nov. 24, 1885.



Witnesses;
C. O. Palmer,
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASS., ASSIGNOR TO THE AMERICAN BUTTON FASTENER COMPANY, OF NEW BRITAIN, CONN.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,925, dated November 24, 1885.

Application filed January 19, 1885. Serial No. 153,236. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Button-Setting Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

10 Figure 1 is a plan view of a machine embodying my present improvements. Fig. 2 is a front elevation of the same machine. Fig. 3 is an elevation of the side at the right hand in Fig. 2. Fig. 4 is a vertical longitudinal section as seen from the right-hand side of the machine. Fig. 5 is a plan view of a part of the button-feeding mechanism, the upper part of the machine being removed. Fig. 6 is a vertical section of a small part of the button-hopper, illustrating how buttons are taken therefrom. Fig. 7 is a similar section of the front end of the button-channel, where the buttons are secured to the fabric. Fig. 8 shows a plan and side view, drawn in projection, of the button-fastener channel. Fig. 9 is a section in line *a a*, Fig. 8. Fig. 10 is a section in line *b b*, Fig. 8. Fig. 11 shows the cut-off plate having a fastener in one position. Fig. 12 shows the same plate having the fastener therein in a reversed position. Figs. 13 and 14 are enlarged views of a part of Fig. 4, illustrating the operation of the fastener-setting devices. Fig. 15 is a section in line *C C*, Fig. 13. Fig. 16 is an enlarged view of a part of Fig. 2, showing a button-fastener finished setting.

Similar reference-characters refer to similar part in all the views.

40 This invention relates to improvements in machines for automatically attaching buttons to fabrics by means of malleable-pointed fasteners.

The principal object of my invention is to provide a machine of the class described, 45 which shall feed the fasteners and buttons from hoppers, and which shall be adapted to use that kind of malleable-pointed fastener known in market as "Kempshall's One-Prong Button-Fastener."

50 The invention consists in certain improve-

ments, devices, and combinations hereinafter described and claimed.

As shown in the drawings, the frame-work of the machine consists of a bed-plate, *A*, having a front upright, *A*², a rear upright, 55 *A*³, and beams *A*⁴, these members having suitable bearings for receiving the working parts.

S designates the principal or cam shaft of the machine, driven by pulley *P*, and carrying pulleys *P*² and *P*³, cams *N* and *N*², and 60 crank-arm *V*³.

*S*³ designates a second driving-shaft having a pulley, *J*³, which is driven from shaft *S* by belt *P*⁵. From said shaft *S*³ the button-hopper *K* and the fastener-hopper *H* are driven 65 preferably by means of some suitable gearing. Hopper *K* may be provided with a gear, *K*³, meshing with gear *L* on shaft *L*², revolving in bearing *L*³, said shaft *L*² being driven from shaft *S*³ by means of gears *L*⁴. Hopper *H* 70 may be provided with gear *H*⁴, meshing with gear *J* on said shaft *S*³, this and the afore-said gearing being so proportioned as to drive the hoppers at the required velocities, which may be varied to suit such buttons and fast- 75 eners as in any particular case the machine may have been designed for using. Hopper *H* is supported in a bearing formed in the rear upright, *A*³, (see Fig. 4,) and has a series of buckets, *H*², for delivering charges 80 of its supply of button-fasteners onto the upper side of the endless apron *I*. This apron has a continuous slot for receiving the fastener-prongs, and is carried by wheels *I*³ and *I*², of which wheels the first is fixed on shaft 85 *S*³ and drives the apron, while the last is carried by pin *I*⁴, fixed in ears 2 at the rear end of fastener-channel *G*. Between said ears (see Fig. 8) this channel is made narrow and fitted to the curve of the apron, so that fast- 90 eners coming along on the apron with their prong in its slot will enter the channel, while the others slide off into the hopper. As shown at 5, Figs. 9, 12, the fastener has its prongs on one side of the center of the head, 95 and consequently the channel must be constructed to receive them either side first, or means provided to throw out such as come into said channel in the wrong position. Of these alterations I have preferred the first, 100

and accordingly have made the said channel to receive fasteners in both positions. The upper part of it is made narrow, corresponding to the width of a prong and to the slot in the endless apron, as shown in Fig. 9. At this point (line *a a*, Fig. 8) since the prongs are guided by the channel there is no need for guides at the ends of the fastener-heads. Farther down the channel, however, as shown in Fig. 10, the channel is widened, and guides 3 and 4 are provided to bring the heads into alignment, while the prongs are thrown either to one side or the other according to the way in which the fasteners are put into said channel. This is illustrated by the two fasteners 5 and 6 in Fig. 10. To prevent accidental displacement of the fasteners, the lower part of the channel may be covered by plate or cover G^5 , which is preferably removably secured to the top of the channel.

E^2 designates the driver-slide cap, and E the driver-slide, which is grooved to receive the driver F , and is provided with a cut-off plate, F^3 , having an opening, 7, through which fasteners are admitted at the proper times from the fastener-channel to the driver-channel, which is in front of said cut-off and below the point of the driver. Fig. 13 shows these parts in position to admit a fastener, as above stated. Fig. 14 shows the driver-slide moved down, one fastener, 8, being in the cut-off opening, and another one, 9, driven down in the driver-channel, as in the operation of setting. The cut-off plate corresponds in thickness to the fasteners using, and is made to serve as a spring to press forward onto the fastener which is being driven, so as to prevent it from getting out of place or falling faster than followed by the driver. By means of this construction no opportunity is given for the fastener to get misplaced while passing from the channel into the fabric, and it does not have to pass by any opening in the side of the driver-channel. This part of my present invention is in the nature of an improvement on a similar mechanism described in Letters Patent of the United States No. 311,033, granted to me January 20, 1885, the cut-off plate described herein being a substitute for the cover C shown, described, and claimed in my said patent. The driver-slide is held down by a spring, 10, or equivalent device, and is lifted by a stop, 12, at the top of said slide, which stop is pushed up by driver F on its upward stroke. By means of this stop, the stroke of the driver being determined, the upward stroke of slide E may be adjusted to bring opening 7 into proper alignment with the fastener-channel. Driver F is operated from an arm, F^4 , by means of suitable connecting-gearing, as teeth 13 and 14. Said arm is fixed to shaft S^5 , which has an arm, V , connected by rod V^2 to crank V^3 on driving-shaft S . I do not limit my invention to this particular mechanism for connecting driver F to shaft S ; but I may use instead any one of the numerous and well-known devices adapted therefor.

D^2 is a cap on which the fabric T is placed in proper position under the driver-slide for setting the first button, a presser, W , being lowered onto said fabric to hold it in place. This presser may be of any kind, such as are used on sewing-machines or of similar description. As shown in the drawings, it is fixed to a spindle, W^2 , which is carried in lugs on one side of upright A^2 , (see Figs. 1 and 2,) said spindle being held down by spring W^4 and lifted by means of a cam, W^5 , pivoted thereto.

O is a chute, having a slot, O^2 , for holding the shanks in proper position, through which the buttons are fed into the place for attaching them to the fabric, which place is directly beneath the driver-channel, as at 16, Figs. 4, 5, and 7.

M is a guard, which, together with cap D^2 , holds in place a slide, D' , the end of which is reduced to enter the shank of the button which is at 16, and which has a concave die, D , formed in the upper side of said reduced part. This is shown best in Figs. 5 and 7. Said slide is given a reciprocating motion, for the purpose of withdrawing the die from and inserting it into a button-shank, by means of a lever, D^3 , which is connected to it at 17, pivoted to the frame at 18, and has a pin, D^5 , working into a groove, 19, in a cam, N , on shaft S . The chute O terminates in a feed-wheel, B , fixed on shaft S^4 , which shaft has a spur-wheel, R , that is intermittently rotated by a spiral cam, N^2 , on shaft S . A spring-detent, Q , is provided to hold the feed-wheel in place with a moderate force during its intervals of rest. Said wheel has a series of notches, 20, one of which is brought to coincide with chute O at each forward movement of this wheel. These notches are made at such distances apart as correspond with the required positions of the buttons on the fabric. Guard M is preferably grooved, as at 21, Fig. 4, to form a guide for the button, so that it cannot escape from the feed-wheel until it has passed by this guard. This feeding mechanism operates to feed the fabric by feeding the buttons which are attached thereto. A button having been fed to the feed-wheel and secured to the fabric, the feed-wheel then pushes it along, and of course the button-fastening draws the fabric along with it. A sufficient number of buttons having been inserted, the fabric may be forcibly drawn out from under the presser, the buttons turning the feed-wheel until they pass the left-hand end of guard M . A suitable gage, as M^2 , Figs. 4 and 5, may be provided, against which to place the fabric to determine the distance from said edge of the buttons in the usual manner.

The button-feeding mechanism whereby buttons are taken from the hopper K , fed into chute O , and pushed through said chute to the setting-die, consists of the following: A shaft, S^2 , supported in bearings formed in beams A^4 , has a pulley, C^2 , whereby it is driven by the friction-belt P^4 from a pulley, P^2 , on shaft S .

On this shaft is fixed a button-feeding wheel having one or more button-shank-receiving arms, C, adapted to enter the shank of a button (see Fig. 6) and convey it into the rear end, 24, of said chute O. This chute at this end is curved so that the buttons will be pulled off from the arms at about the point 25, and so that said arms will pass by, as at 26, Fig. 5. That part between points 24 and 25 is made concentric, or nearly so, to shaft S², so that the arms C may retain hold of the buttons for a little time after they enter the chute.

During the operation of the machine the button-feed wheel revolves in the direction of the arrow, carrying the arms into hopper K at 27 and out at 28, Fig. 4, and the said hopper revolves so as to propel the buttons against the point of the arms. When that wheel has filled chute O from the setting-die back to point 25, the shanks cannot be drawn from the arms, and consequently the wheel must stop until some of the buttons are used out of said chute. During this time the friction of belt P¹ presses the arm forward with sufficient force to keep a button in position 16 ready for attaching to the fabric. The form of point which I consider best for arm C is shown at 30, Figs. 5 and 6; but this shape may be varied considerably without materially affecting their efficiency.

It will be understood that suitable mechanism for conveniently starting and stopping the machine is to be provided.

In the operation of the machine the respective hoppers are first properly supplied with buttons and fasteners, and the machine run long enough to fill the button-chute and the fastener-channel. The fabric or material to which buttons are to be attached is then placed under the driver-slide, the presser is lowered, and the machine is started up. Its first operation is to insert die D through the shank of button 16. Then a fastener is driven down, either one or the other side first, as in Fig. 11 or as in Fig. 12, and set substantially as in Fig. 16. The driver is then raised, lifting up slide E, the button and fabric is fed along by wheel B, another button fed to position 16 and another fastener into the driver-channel, and the setting operation repeated, and so on as long as required. The several cams are so constructed and set on the driving-shaft that the operation of the several mechanisms or parts may take place in their proper order at the proper time, substantially as hereinbefore described.

I claim as my invention—

1. In a button-setting machine, the combination of a button-fastener-driving mechanism, the laterally-movable die for bending over into a hook the point of the button-fastener, mechanism, substantially as described, for operating said die, a button-chute leading to said die, and a button-feeding device, substantially as described, for feeding buttons

away from said die after they are attached to a fabric, substantially as described, and for the purpose specified.

2. In a button-setting machine, the combination of the button-chute O, and the die D, adapted to have a lateral movement to enter the shank of a button placed in said chute, and means, substantially as described, for moving said die athwart said chute, substantially as described.

3. In a button-setting machine, the combination of chute O, slide D', having die D, wheel B, and means, substantially as described, for operating said slide and wheel, substantially as set forth.

4. The combination of wheel B, having notches 20, and guard M, having groove 21, substantially as described, and for the purpose specified.

5. The combination of a moving button-hopper, a fixed button-receiving chute, and one or more button-carrying arms, substantially as described, and means for moving said arm or arms to the chute, arranged to operate substantially as shown and described.

6. The combination of a revolving button-hopper, one or more revolving button-shank-receiving arms, mechanism, substantially as described, for operating said hopper and said arms, and a button-receiving chute, substantially as described, and for the purpose specified.

7. In a button-setting machine, the combination of button-chute O, having groove O², and curved substantially as described, a wheel having one or more button-shank-receiving arms, substantially as described, and frictional driving device, substantially as described, for so operating said wheel as to feed forward the buttons in said chute, substantially as set forth.

8. The combination of a slide having a driver-channel, a driver in said channel, a fastener-channel leading to said driver-channel, and a cut-off plate interposed between said channels, having an opening through which to admit fasteners from the one to the other, substantially as described.

9. In a button-setting machine, the fastener-channel G, having a groove wider than the fastener-prongs, and guides 3 and 4, and a cut-off plate having opening 7, to admit the passage through it of fasteners placed either side first, substantially as set forth.

10. The combination of slide E, driver F, channel G, cut-off plate F³, and stop 12, whereby the upward stroke of said slide may be so adjusted as to bring said cut-off into proper alignment with said channel, substantially as described.

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