

No. 723,080.

PATENTED MAR. 17, 1903.

T. TOWNSEND.

FILLING MACHINE FOR COMBING NEEDLES.

APPLICATION FILED AUG. 1, 1902.

NO MODEL.

4 SHEETS—SHEET 1

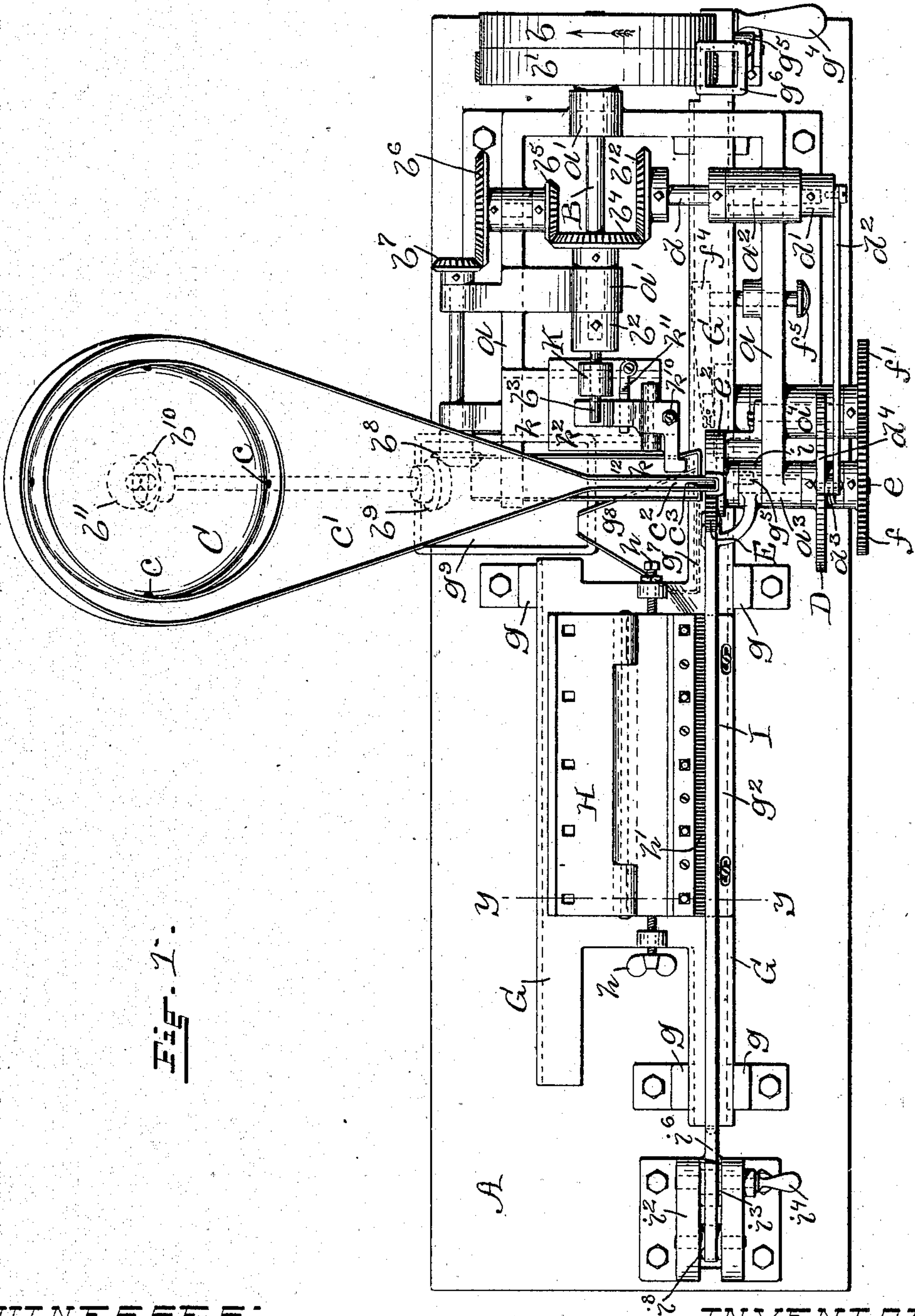


Fig. 1.

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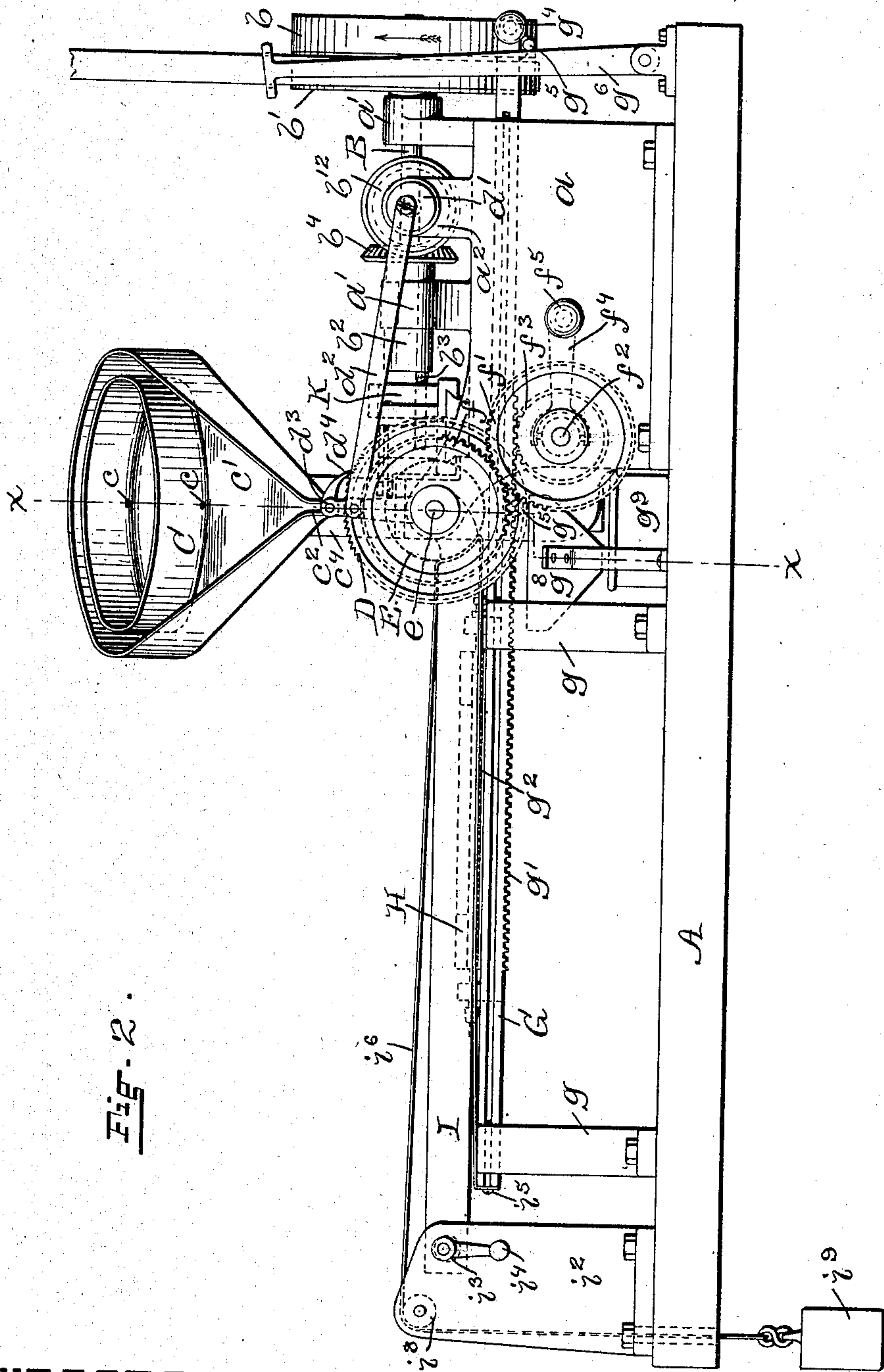


Fig. 2.

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4 SHEETS—SHEET 4.

FIG. 6.

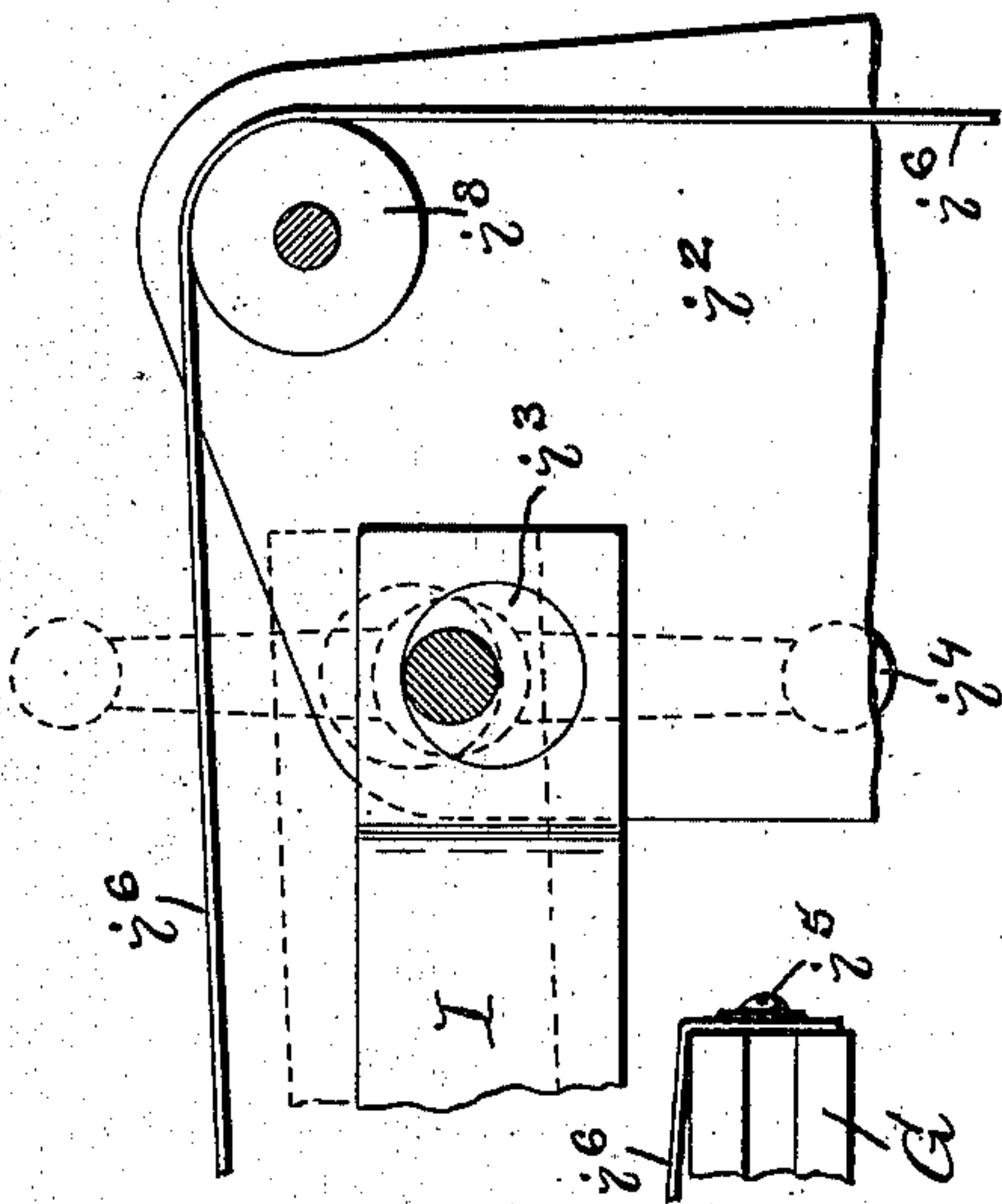


FIG. 8.

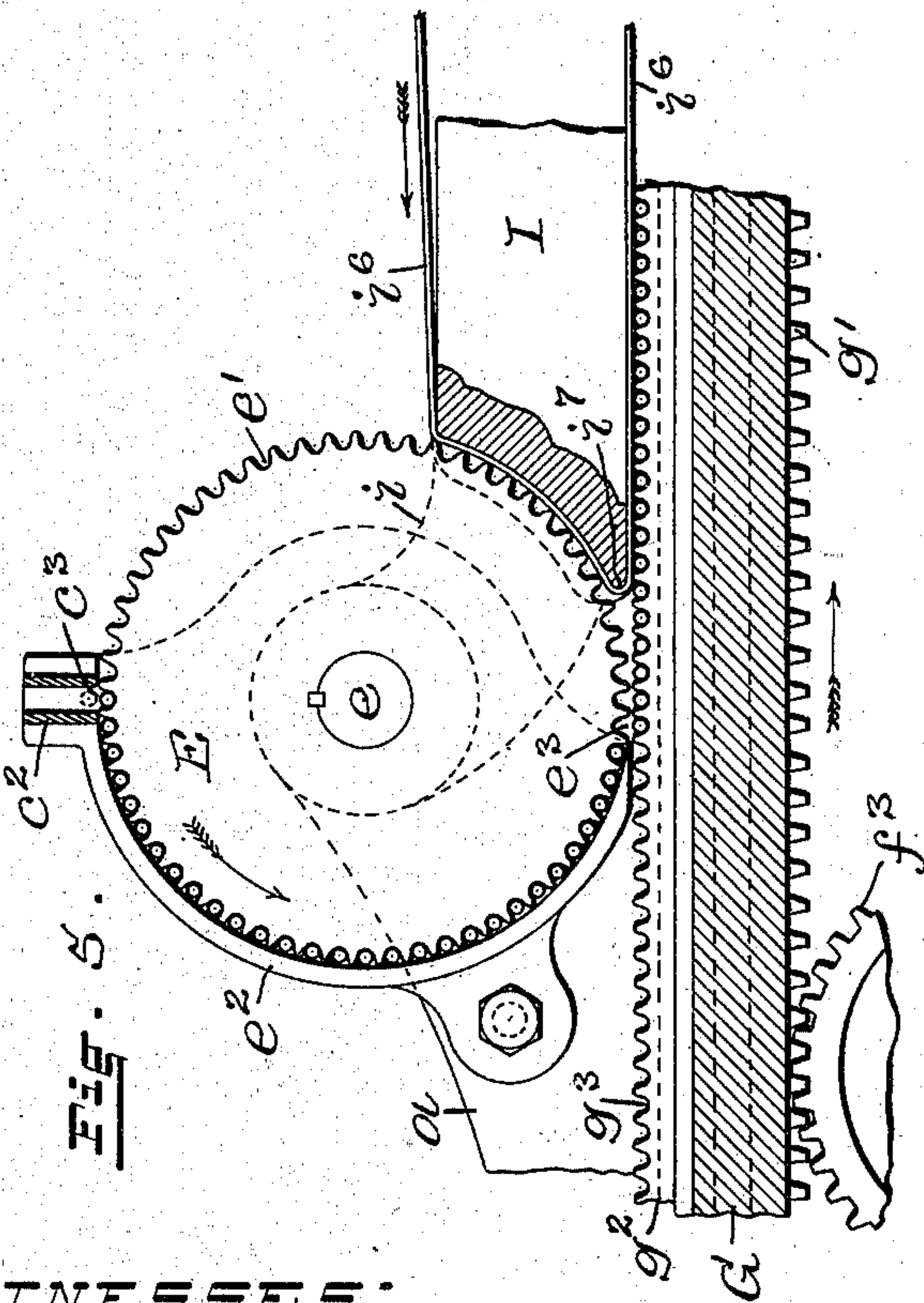
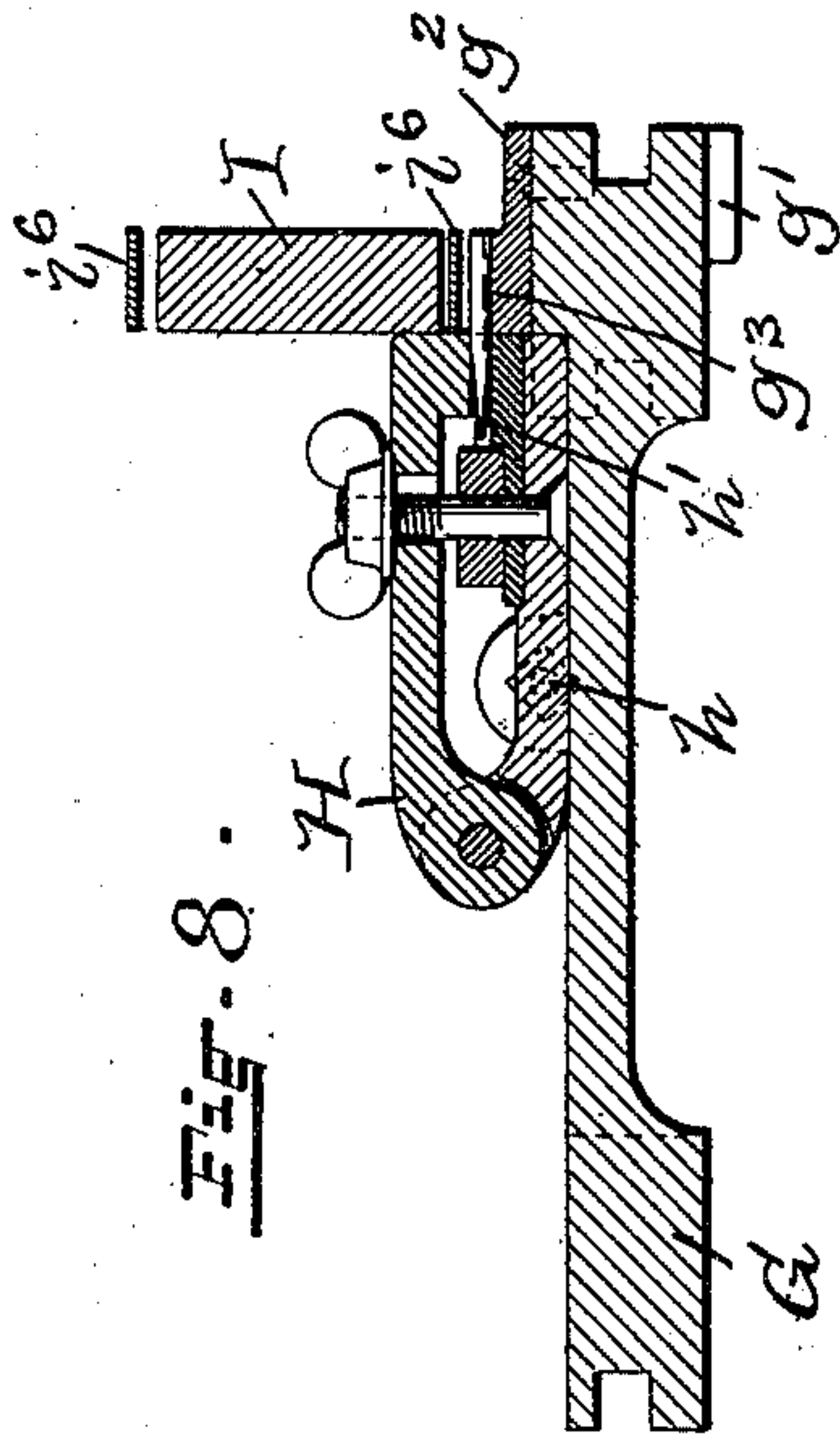
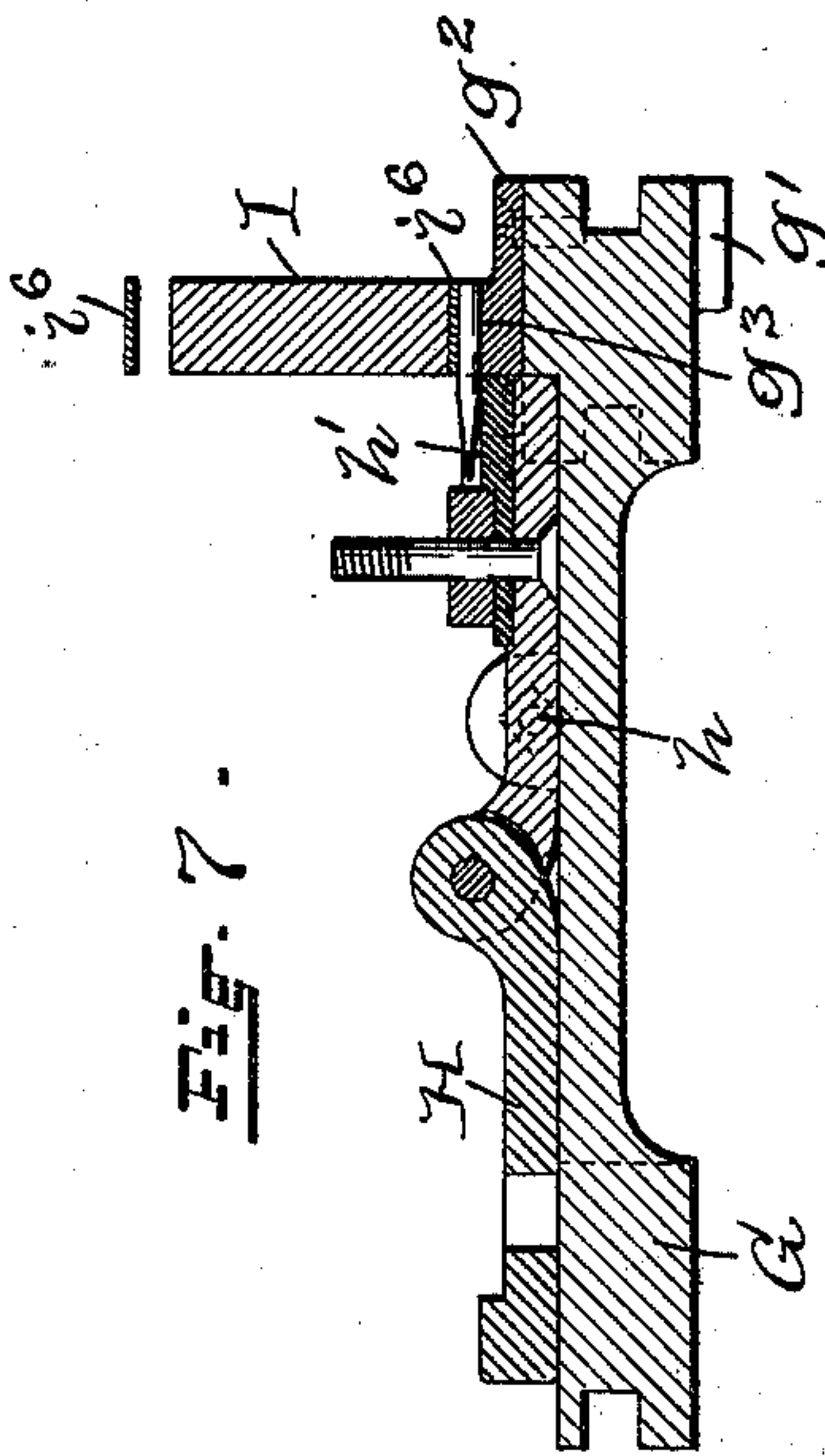


FIG. 7.



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UNITED STATES PATENT OFFICE.

THOMAS TOWNSEND, OF PROVIDENCE, RHODE ISLAND.

FILLING-MACHINE FOR COMBING-NEEDLES.

SPECIFICATION forming part of Letters Patent No. 723,080, dated March 17, 1903.

Application filed August 1, 1902. Serial No. 117,933. (No model.)

To all whom it may concern:

Be it known that I, THOMAS TOWNSEND, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Filling-Machines for Combing-Needles, of which the following is a specification.

The operation of filling combing-machine needles to the clamping-blocks has heretofore been done by hand. This is necessarily a very slow and tedious operation, necessitating the picking up of the needles and inserting them one by one into the apertures in the clamping-blocks.

The object of this invention is to feed the needles to the clamping-block automatically. For this purpose I have devised a machine with a hopper, a chute leading from the hopper to the top of a needle-filling wheel, and a bed sliding under the needle-filling wheel and carrying the clamping-block, with indentures for the needles, with means for revolving the hopper to feed the needles down the chute to the filling-wheel, and means for rotating the filling-wheel and sliding the bed with the clamping-block under the filling-wheel at the same ratio, to fill the indentures in the clamping-block with needles and when filled to stop automatically, with other details of construction to more fully accomplish the object of a complete automatic machine, as will be more fully set forth hereinafter.

In the operation of the machine the clamping-block is open. When filled, it is closed on the needles and secured by clamping-bolts, thus securely holding the needles in their proper position. A bar in the machine is then raised to free the needles from the machine. The block is then freed from the bed and goes to the solderer, who solders the heads of the needles together into one continuous strip. They are then ready for the blocks of the combing-machine.

Figure 1 is a plan view of my complete machine, showing the main shaft with the fast and loose pulleys, the gearing to transmit power from the main shaft to the hopper and from the main shaft, the gearing, eccentric, rod, and pawl and ratchet to rotate the needle-filling wheel, the device for extracting any needle that has been fed to the fill-

ing-wheel point first, and the eccentric-pin on the end of the main shaft for operating the same, the clamping-block secured to the sliding bed, the handle on the end of the bed, and the pins on the bed to engage with the shipper to throw the belt onto the fast pulley when the bed is moved inward by the handle and onto the loose pulley when the bed has moved outward to its limit, automatically stopping the machine. Fig. 2 is a front view of the machine, showing the shipper with the belt on the loose pulley and one of the pins on the sliding bed in engagement with the shipper, the eccentric, eccentric-rod, and pawl and ratchet for rotating the needle-filling wheel, the gearing for transmitting power from the ratchet-shaft to the rack under the sliding bed, and the pivoted pressure-bar with the weighted tape to keep the needles in their proper position and the cam and crank for raising the pressure-bar to release the needles from the machine when required. Fig. 3 is an enlarged cross-sectional view through the machine, taken on line X X of Fig. 2, showing the inclined chute from the hopper, the gearing to revolve the hopper, the device for extracting reversed needles from the filling-wheel, and the eccentric-pin on the end of the main shaft in full, the ratchet-shaft with the pawl and ratchet on its outer end and the needle-filling wheel on its inner end and over the sliding table shown in section, the means of gearing from the ratchet-shaft to the rack under the table, the clutch for releasing the gearing from the table to allow the table to move inward and not rotate the needle-filling wheel, the inclined cut-away part of the sliding bed to allow all needles not used to drop into the receptacle on the base of the machine by means of the chute, and the inclined chute for carrying the reversed needles from the filling-wheel to the same receptacle. Fig. 4 is a detail sectional view, enlarged, showing the upper part of the needle-filling wheel, the end of the supply-chute with the opening over the filling-wheel, and a reversed needle on its way down the chute to the receptacle on the base of the machine. Fig. 5 is a detail sectional view, enlarged, showing the needle-filling wheel, the semi-circular shield for holding the needles in the grooves of the filling-wheel, the sliding bed

with the grooved bar for receiving the needles from the filling-wheel, and the pivoted pressure-bar and tape to firmly hold the needles in the grooved bar on the sliding table. Fig. 6 is a detail view showing the cam and crank for raising and lowering the pressure-bar, a part of the frame with bearings for the cam-shaft, and the pulley for the weighted end of the pressure-bar tape. Fig. 7 is a cross-section taken on line Y Y of Fig. 1 through the sliding table, the pressure-bar, and the clamping-block, showing the pressure-bar down and the clamping-block open. Fig. 8 is a similar view to Fig. 7, showing the pressure-bar up to release the needles and the clamping-block closed and clamped onto the needles by the clamping-bolts.

In the drawings, A is the base of the machine, to which the frame a is secured, and B the main shaft, with bearings a' a' in the frame a and having the fast and loose pulleys b and b' on its outer end and the collar b^2 , with the eccentric-pin b^3 , fastened to its inner end. On the main shaft B, I also secure the bevel-gear b^4 . From this gear power is transmitted to all the operative parts of the machine, as shown in Fig. 1. From the gear b^4 power is transmitted by the gears b^5 , b^6 , b^7 , b^8 , b^9 , b^{10} , and b^{11} to the hopper C to revolve the hopper and cause the needles to drop out through the holes c into the inclined chute c' . The needles slide down the inclined chute head first and enter the contracted part c^2 . This places them in the proper position to enter a groove in the filling-wheel through a slot c^3 in the lower end of the chute. The hopper c and the chute c' are supported by the bracket c^4 , bolted to the frame a , as shown in Fig. 3.

Meshing with the gear b^4 is the gear b^{12} on the shaft d at right angles to the main shaft B. This shaft d has a bearing a^2 in the frame a and has secured to its outer end the disk d' . The eccentric-rod d^2 is pivoted to the face of the disk d' at one end slightly off center and to the pawl-arm d^3 at the other end. The pawl-arm d^3 is pivoted at its lower end on the ratchet-shaft e . This gives a slight reciprocating motion to the pawl d^4 sufficient to take up one tooth on the ratchet D to one revolution of the main shaft B.

On the ratchet-shaft e is secured the ratchet D, the filling-wheel E, and the gear f , rotating in the bearing a^3 on the frame a , as shown in Fig. 3 and in the direction as shown by the arrow in Fig. 5. On the periphery of the filling-wheel E and parallel to its axis are grooves e' for receiving the needles from the chute c' through the slot c^3 . These grooves correspond in number to the number of teeth on the ratchet D. The needles are held in these grooves by the shield e^2 , bolted to the frame a , until they reach the delivery-point e^3 on the under side of the filling-wheel. They are then free to drop into the grooves in the fixed bar on the sliding bed and the corresponding indentures in the clamping-block.

The gear f on the ratchet-shaft e meshes with the gear f' , secured to the outer end of the shaft f^2 , having its bearing a^4 in the frame a , with the spring-pressed clutch F and the rack-gear f^3 on its inner end. When the clutch F is released by the forked arm f^4 and the push-rod f^5 , as shown in Figs. 1, 2, and 3, the rack-gear f^3 is free to revolve on the shaft f^2 . By this means the sliding bed can be run in to start the machine without revolving the needle-filling wheel in the reverse direction.

The sliding bed G is supported on ways in the frame a and in the uprights g , secured to the base A, and has on its under side the rack g' , meshing with the rack-gear f^3 . Adjustably secured to the sliding bed and on a line with the needle-filling wheel is the bar g^2 , with the grooves g^3 for receiving the needles. The clamping-block H on the bed is adjusted by the screws h h to bring the indentures h' in the clamping-block and the grooves g^3 in the bar g^2 together. On the right-hand end of the sliding bed is the handle g^4 for moving the bed inward and starting the machine. On the side of the sliding bed are the pins g^5 g^5 , which coming into engagement with the shipper g^6 by the movement of the bed inward throw the belt onto the fast pulley b and, when the bed has reached its outward limit, onto the loose pulley b' , stopping the machine as the sliding bed runs out beyond the point of feed for the needles. To facilitate the handling of the clamping-block H, the bed at this point has the inclined part g^7 to allow the needles not used to drop down the chute g^8 and into the receptacle g^9 on the base of the machine.

Over the sliding bed G and on a line with the needle-filling wheel is the pressure-bar I, pivoted at its inner end i to the ratchet-shaft e and at its outer end supported in the frame i^2 by the cam i^3 , controlled by the crank i^4 to raise or lower the pressure-bar when required.

Fastened to the end of the sliding bed G by the screw i^5 is the tape i^6 . This tape goes under the pressure-bar and over the needles as they come from the filling-wheel, pressing them into the grooves g^3 and the indentures h' in the clamping-block. The tape then goes over the point i^7 , as shown in Fig. 5, upward between the bar and the filling-wheel, then backward and over the pulley i^8 to the weight i^9 , as shown in Fig. 2. With the sliding bed in, the weight i^9 is at its lowest point. As the bed moves outward it takes up the tape i^6 . The tape slides around the point i^7 against the tension of the weight i^9 , covering the needles as they are deposited in the grooves from the filling-wheel and raising the weight. This action continues until all the grooves are filled with needles and the machine stops. If by chance a needle should enter the filling-wheel reversed, or point first, it is extracted by the extracting mechanism K. (Shown in Figs. 1 and 3.) On the frame a is the bracket k , extending inward, with ways k' for the slide

k^2 . On the slide is the upright k^3 , with the slot k^4 for the pin b^3 . The pin b^3 is set off center in the collar b^2 on the main shaft B and revolves in the direction of the arrow, as shown in Fig. 3, giving a reciprocating motion to the slide k^2 . Extending upward from the slide is the arm k^5 with the fixed jaw k^6 and forming a pivot k^7 for the pivoted arm k^8 with the jaw k^9 and the adjusting-screw k^{10} . The pin b^3 extends through the slot k^4 and over the pivoted arm k^8 and in its downward movement depresses the arm k^8 , opening the jaws k^6 and k^9 against the pressure of the spring k^{11} on the slide k^2 . As the pin revolves it carries the slide forward with the jaws open and in a position to grasp a needle in the filling-wheel. When the slide has reached its forward limit, the pin b^3 releases the arm k^8 , the jaws close by the pressure of the spring k^{11} , the slide moves backward, and the jaws open by the pin b^3 depressing the arm k^8 . By this operation a reversed needle, or one that has entered a groove in the filling-wheel point first, is grasped by the jaws k^6 and k^9 on the head end, extracted from the filling-wheel, and dropped into and down the chute k^{12} to the receptacle g^9 on the base of the machine. The closure of the jaws k^6 and k^9 is limited by the set-screw k^{10} to grasp only the head end of the needle, leaving all needles that have entered the filling-wheel head in and point out undisturbed.

In the drawings, Figs. 1 and 2 show the machine in the position to start, with the sliding bed out and the clamping-block on the bed open. The operation is as follows: The hopper C is supplied with needles, and the operator stands in front and presses the push-rod f^5 with his left hand. This opens the clutch F, releasing the gearing from the sliding bed G, and with his right hand grasps the handle g^4 , moving it to the right. This moves the bed G inward, bringing the inner pin g^5 into engagement with and moving the shipper g^6 to throw the belt onto the fast pulley b , starting the machine, and at the same time releasing the push-rod f^5 to lock the clutch F. The hopper C revolves by the gearing from the main shaft, and the needles drop through the holes c in the hopper onto the chute c' . The head end of the needles being the heaviest they then slide down head end first through the slot c^3 and into a groove e' in the filling-wheel E. The gears b^4 and b^{12} and the disk d' rotate to give motion to the pawl d^4 through the eccentric-rod d^2 to take up one tooth on the ratchet D for one revolution of the main shaft B. This rotates the filling-wheel E the space of one groove and through the gears f , f' , and f^3 to the rack g' moves the bed G outward the space of one groove. These movements continue until all the grooves g^3 in the bar g^2 and the indentures h' in the clamping-block H are full of needles and the outer pin g^5 on the bed G comes into engagement with the shipper g^6 , throwing the belt onto the loose pulley b' , stopping the ma-

chine. The clamping-block H is then closed and clamped onto the needles. The pressure-bar I is raised by the crank i^4 through the cam i^3 to free the needles from the bar g^2 . The clamping-block with the needles is then released from the bed by the screws h h and goes to the solderer.

Having thus described my invention, I claim as new and desire to secure by Letters Patent--

1. In a machine for the purpose described, a hopper for supplying needles, a bar with grooves for receiving the needles, a wheel with grooves for receiving and delivering the needles to the bar from the hopper, and mechanism for rotating the wheel and moving the bar at the same ratio.

2. In a machine for automatically handling combing-machine needles, a hopper, a wheel for receiving and delivering the needles, a chute leading from the hopper to the wheel, a bed sliding under the wheel to receive the needles, and mechanism to rotate the wheel and move the bed at the same ratio.

3. In a machine for automatically handling combing-machine needles or pins, a hopper, a wheel with grooves for receiving and delivering the needles, an inclined chute leading from the hopper to the wheel, holes in the hopper, a power-shaft, and mechanism connecting the power-shaft and the hopper to revolve the hopper and cause the needles to drop through the holes in the hopper into and down the chute to the receiving and delivering wheel.

4. In a machine for automatically handling combing-machine needles, a receiving and delivering wheel with grooves, a shield to hold the needles in the grooves from the receiving to the delivering point, a pawl and ratchet in connection with the wheel, a power-shaft, and mechanism connecting the power-shaft to the pawl and ratchet to rotate the needle receiving and delivering wheel.

5. In a machine for automatically handling combing-needles, a wheel with grooves for receiving and delivering the needles, a pawl and ratchet connected with the wheel, gearing connected with the pawl and ratchet, a bed sliding under the wheel with grooves for receiving the needles, a rack under the bed, a rack-gear meshing with the rack, a clutch interposed between the rack-gear and the gearing connected with the pawl and ratchet, means for releasing the clutch to slide the bed in, a power-shaft, means for driving the power-shaft, and mechanism connecting the power-shaft with the pawl and ratchet to revolve the gears, to move the bed, and rotate the needle receiving and delivering wheel at the same ratio.

6. In a machine for automatically handling combing needles or pins, a sliding bed, a bar with grooves adjustably secured to the bed for receiving the needles, a pressure-bar over the grooves, a flexible tape interposed between the pressure-bar and the grooves, and

means for operating the pressure-bar and tape to force the needles into the grooves and to release the pressure-bar and tape when required.

- 5 7. In a machine for automatically handling combing needles or pins, a frame secured to a base, a bed sliding in ways in the frame, a power-shaft in the frame with a loose and fast pulley on the shaft, a handle on the bed to
10 move the bed inward by hand, means connecting the power-shaft with the bed to move the bed outward, a shipper pivoted to the base, and pins on the sliding bed to engage with

the shipper to throw the belt onto the fast pulley when the bed is moved inward by hand, 15 and to start the machine and onto the loose pulley when the bed has reached its outward limit to stop the machine.

In testimony whereof I have signed my name to this specification in the presence of 20 two subscribing witnesses.

THOMAS TOWNSEND.

Witnesses:

ADA E. HAGERTY,
J. A. MILLER, Jr.