

(No Model.)

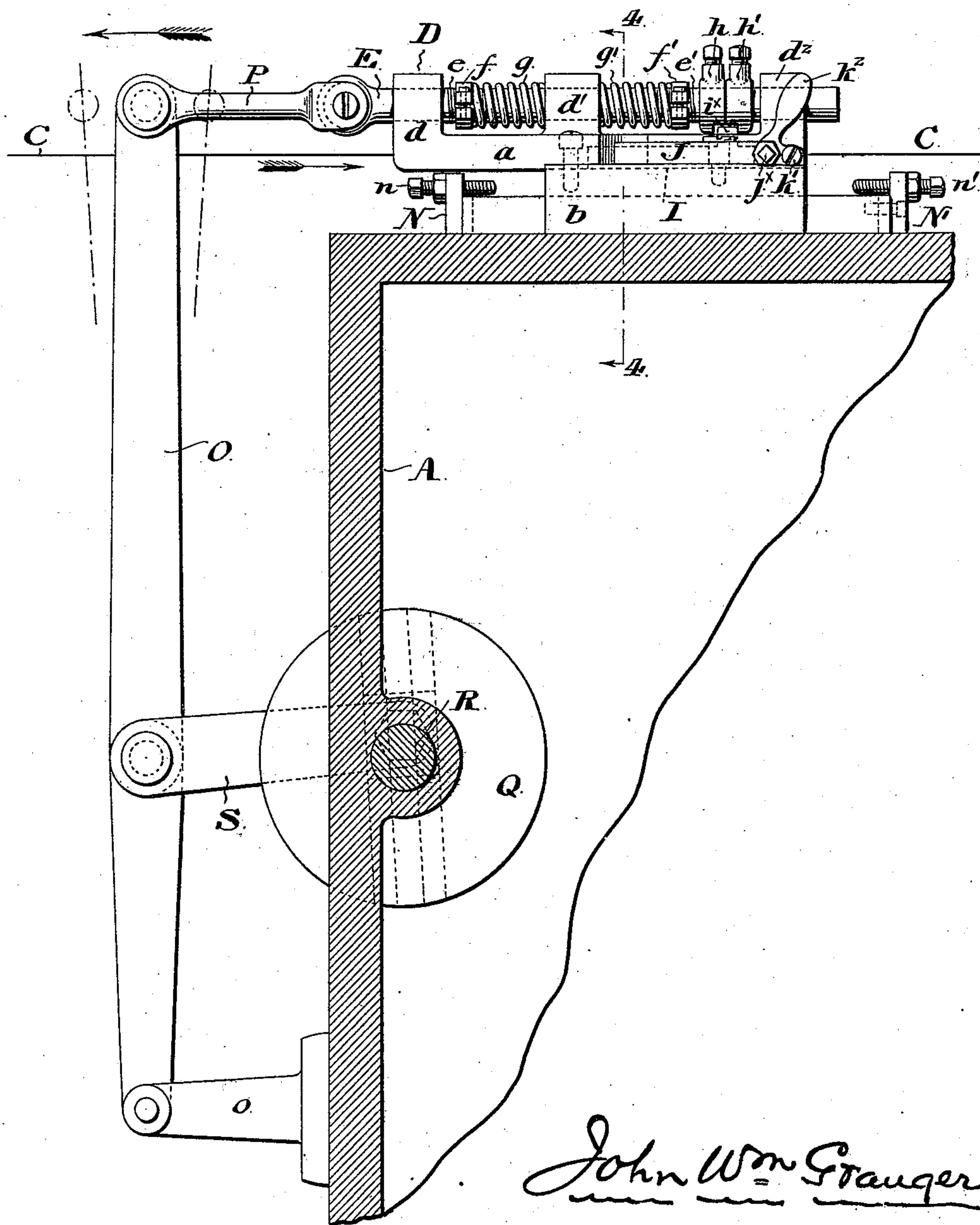
J. W. GRANGER.
WIRE FEEDING DEVICE.

3 Sheets—Sheet 1.

No. 562,222.

Patented June 16, 1896.

FIG. 1.



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(No Model.)

3 Sheets—Sheet 2.

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FIG. 2.

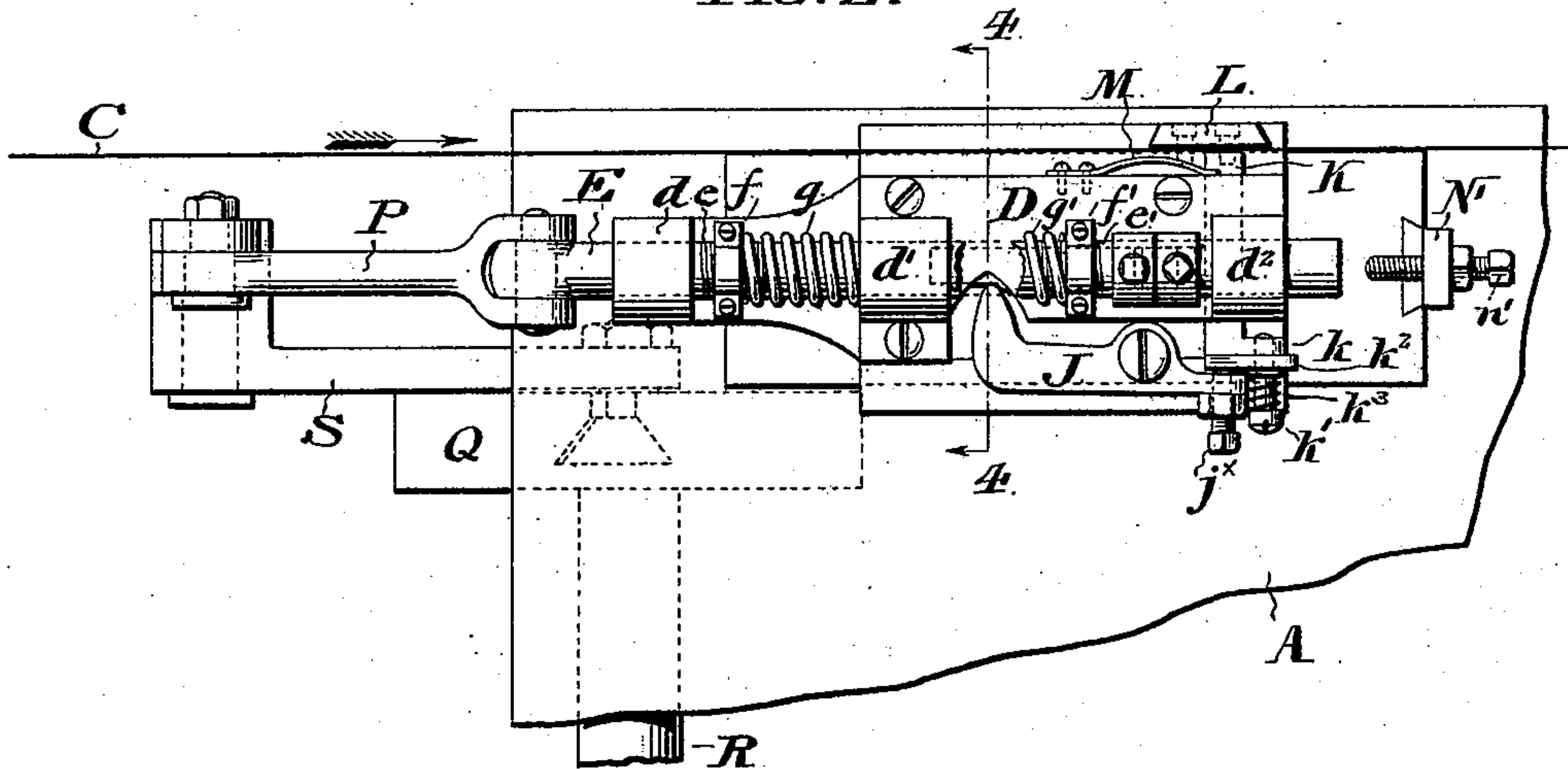


FIG. 3.

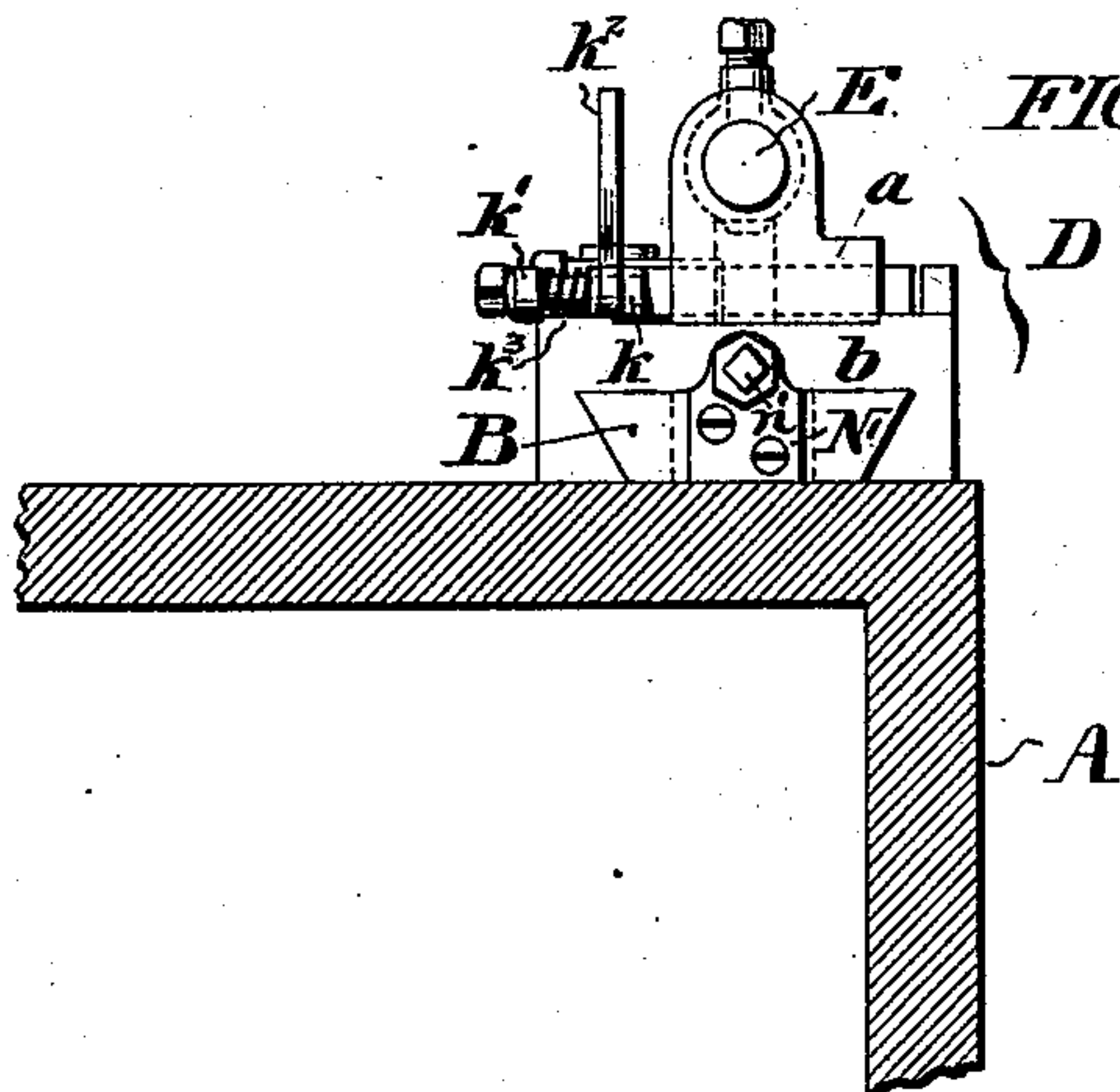
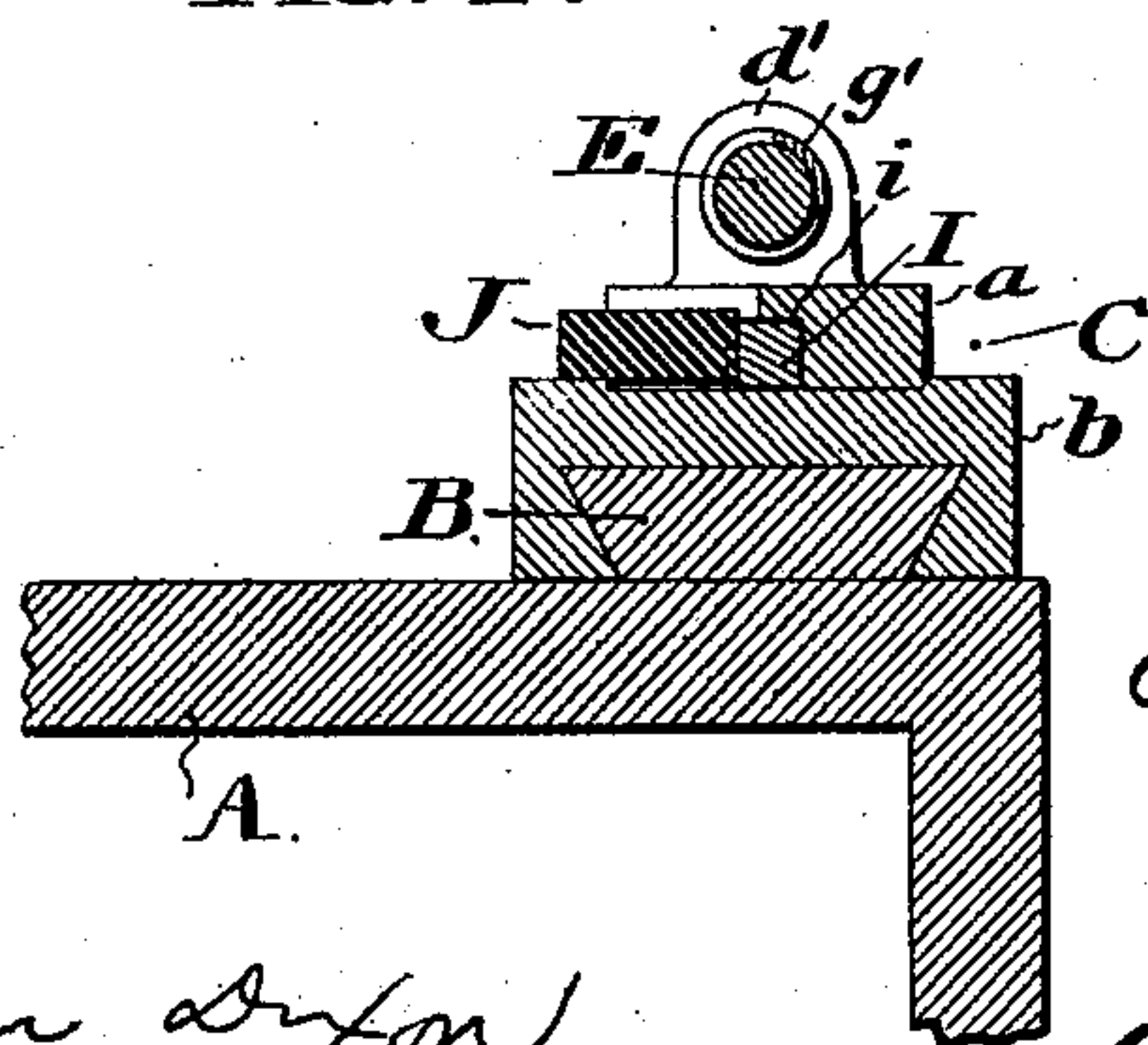


FIG. 4.



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3 Sheets—Sheet 3.

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FIG. 5.

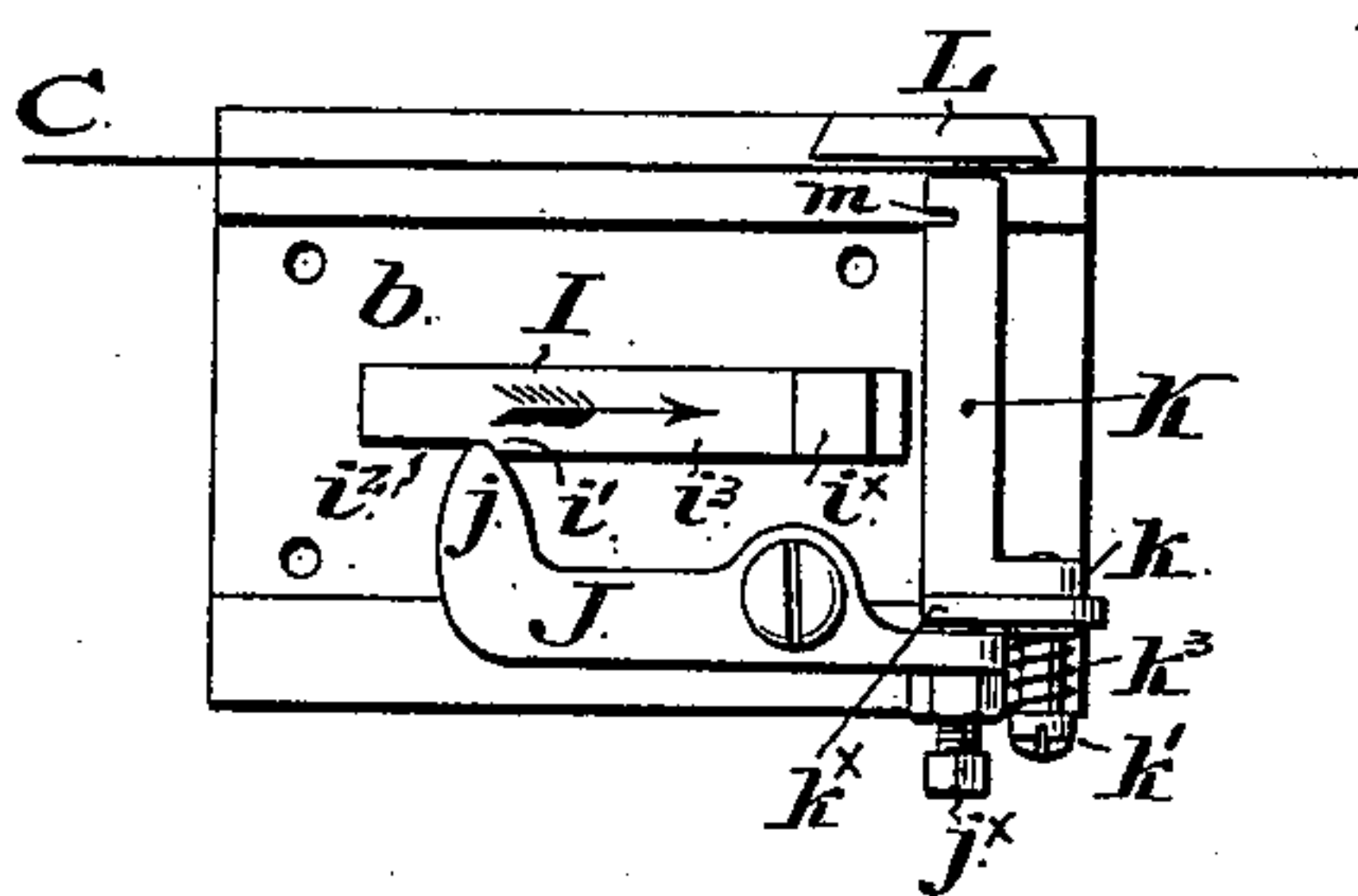


FIG. 6.

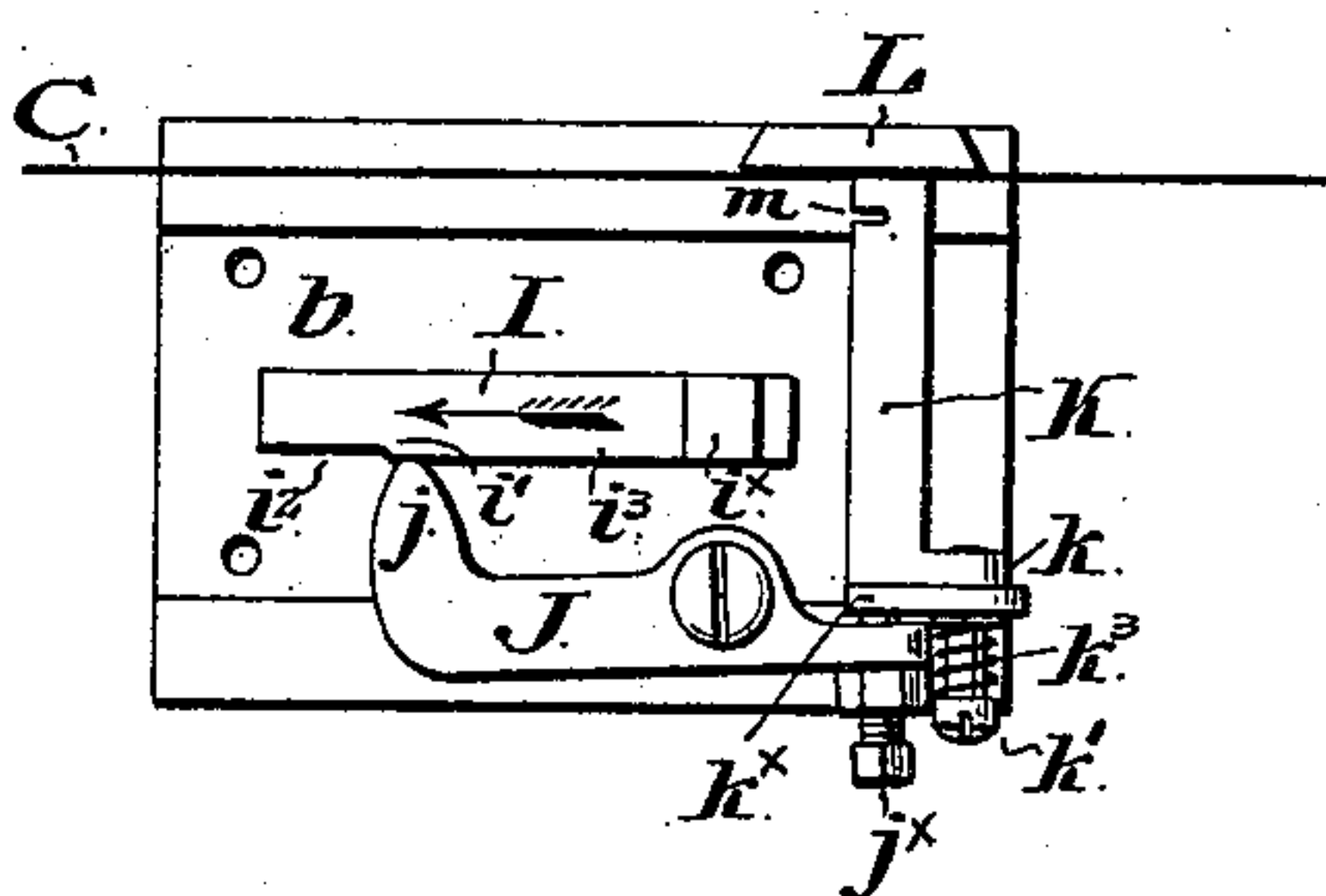
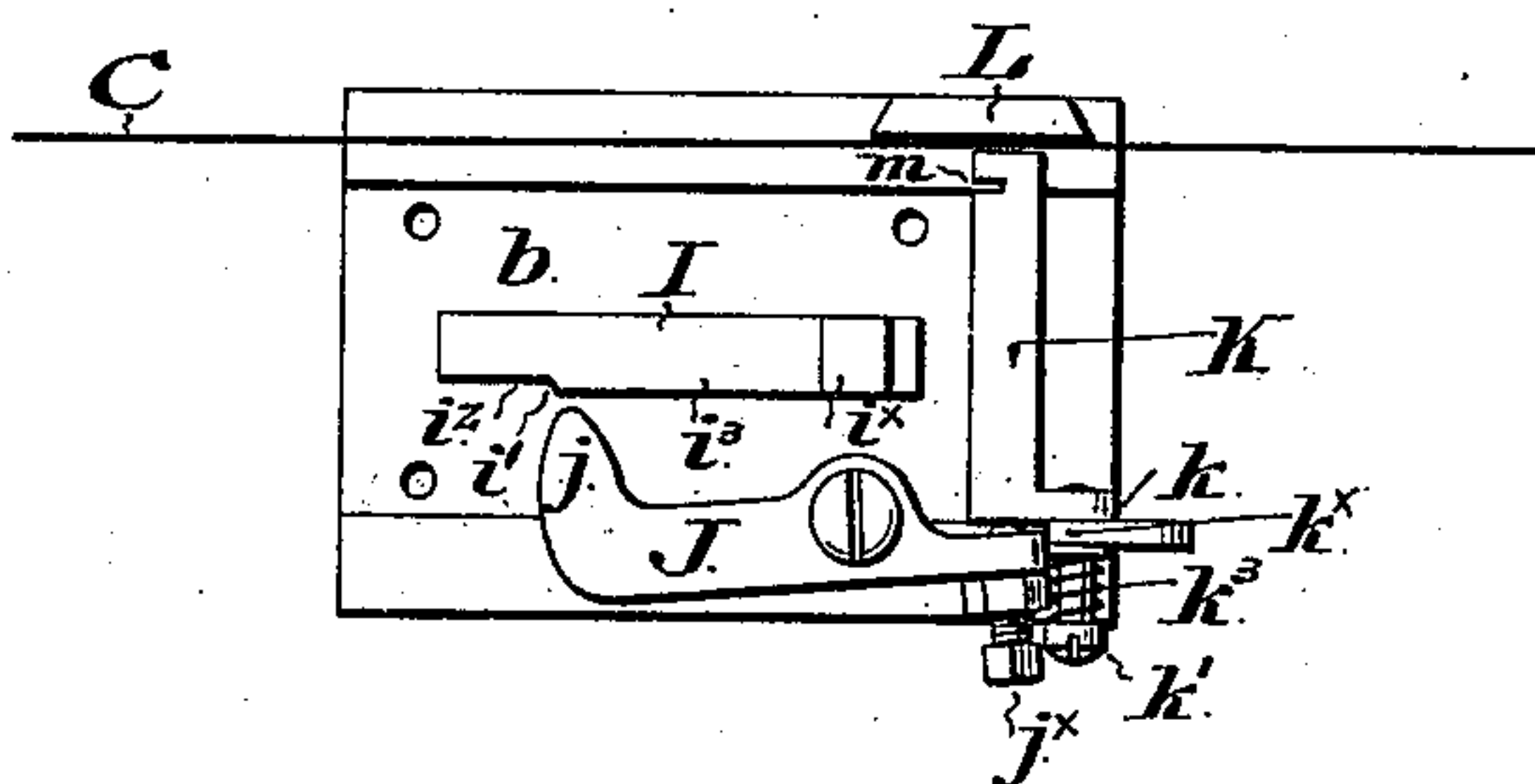


FIG. 7.



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UNITED STATES PATENT OFFICE.

JOHN WM. GRANGER, OF PHILADELPHIA, PENNSYLVANIA.

WIRE-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 562,222, dated June 16, 1896.

Application filed March 16, 1896. Serial No. 583,315. (No model.)

To all whom it may concern:

Be it known that I, JOHN WILLIAM GRANGER, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Wire-Feeding Devices, of which the following is a specification.

My invention relates generally to machines for forming articles of commerce, such as hair-pins, hooks and eyes, and the like, of wire; and it relates especially to devices for automatically feeding wire supplied from a roll or other suitable source to the forming or shaping instrumentalities proper.

It is the object of my invention to provide a wire-feeding mechanism which shall be more simple in construction and more certain in operation and less liable to get out of order than such mechanism as heretofore arranged.

My improved wire-feeding mechanism relates to that class of wire-feeds in which the wire is intermittently fed to the shaping or forming instrumentalities, a given quantity of the wire being, at each forward stroke of the mechanism, delivered to the shaping or forming instrumentalities, and the mechanism in its succeeding rearward movement taking a fresh hold upon the wire, in order to again advance it a predetermined length in its succeeding forward movement.

Apparatus embodying a good form of a convenient embodiment of my invention is represented in the accompanying drawings and hereinafter described, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the accompanying drawings, Figure 1 is a view in side elevation of wire-feeding mechanism conveniently embodying my invention. Fig. 2 is a top plan view of the same. Fig. 3 is a rear elevational view of the apparatus shown in Figs. 1 and 2. Fig. 4 is a transverse vertical sectional elevational view of the mechanism, section being supposed on the dotted line 4 4 of Figs. 1 and 2 and sight being taken in the direction of the arrows applied to said line. Figs. 5, 6, and 7 are top plan views of the lower portion of the body of the carriage, the upper part being supposed removed, exhibiting the arrangement

of the follower, the trigger, and the anvil-jaws, the figures illustrating, respectively, three distinct positions of said devices.

Similar letters of reference indicate corresponding parts.

In the accompanying drawings, A indicates the main frame of the machine, upon which the entire mechanism connected with the formation from wire of an article of commerce may be supposed assembled. That portion of the framework upon which the wire-feeding mechanism is mounted is, however, alone illustrated.

B indicates a way mounted upon the top of the main frame, said way being laterally undercut, as shown especially in Figs. 3 and 4.

C is the wire operated upon by the feeding mechanism.

D is the carriage, the same consisting of a block, formed in two parts, an upper *a* and a lower *b*, bolted together, resting upon the way B, and having depending sides which fit beneath the undercut portions of said way with the result that the carriage is free for longitudinal reciprocation relatively to said way, but is secured against lateral or vertical movement.

The carriage D is provided with a series, three being shown, of upwardly-extending lugs *d d' d''*, the lug *d* being at the front end, the lug *d''* being at the rear end, and the lug *d'* being intermediate of the length of the carriage D. The lugs embody apertures in axial alinement which serve as bearings for a shaft E, mounted in said apertures. The shaft E embodies a threaded area *e* between the lugs *d d'*, and a threaded area *e'* between the lugs *d' d''*.

f is a split nut mounted upon the threaded area *e*.

f' is a split nut mounted upon the threaded area *e'*.

g is a strong spiral spring mounted on the shaft E and bearing, respectively, against the nut *f* and the lug *d'*.

g' is a strong spiral spring mounted on the shaft E and bearing, respectively, against the nut *f'* and said lug *d''*.

h h' are a pair of tappets mounted on the shaft E between the nut *f'* and the lug *d''*, said tappets being each provided with a depending fin.

i is a squared channel formed in the lower face of the upper part a of the carriage D and extending beneath and in parallelism with the shaft E. I is a follower mounted in said channel, provided with a stud i^x , which extends upwardly through a suitable slot formed in the body of the carriage of such length as to allow of slight reciprocatory movement of said follower, and is loosely engaged between the fins of the tappets h h' , and one side of which follower, being the lower side in Figs. 2, 5, 6, and 7, is cut away in the region of its front end, forming a shoulder i' and a side face i^2 in a different plane than the lower side face i^3 of the body of said follower.

J, Figs. 2, 4, 5, 6, and 7, is a trigger, pivotally mounted upon the framework of the carriage D, the head j of which extends through a slot opening into the channel i and into contact with the "lower edge," as I term it, of the follower I, in the region of the shoulder i' , formed on said follower, as described.

K is a movable anvil-jaw extending transversely of the carriage in which it is mounted in a suitable channel or way, formed in the lower face of the upper part a of the same, one end of which jaw opposes the rear end of the pivoted trigger J and the other end of which opposes a fixed anvil-jaw L, mounted in the carriage.

The movable anvil-jaw K, which is adapted for slight movement of reciprocation transversely with respect to the carriage, is provided with an offset k in which is mounted a small headed shaft k' , on which is seated a filling-block k^x , connected with an operating-handle k^2 . A spiral spring k^3 , seated upon said small headed shaft k' and operating, respectively, against its head and said filling-block, maintains said filling-block constantly in contact with the outer end of the movable anvil-jaw, with the result that said filling-block normally acts as a continuation of or an integral part of the said movable anvil-jaw, and, seated or located upon the outer end of said movable jaw, receives the thrust or impact of the rear end of the trigger J. A set-screw j^x is mounted in the rear end of said trigger. The said set-screw j^x , in the operation of the parts, serves as the acting face of the said trigger, through which the movement of the trigger is transmitted to the movable anvil-jaw, the arrangement being designed to enable, by manipulation of said set-screw, adjustment of the contact of the movable anvil-jaw and the trigger.

M is a flat spring, one end of which is secured to the carriage and the other end of which is entered in a small recess m , formed in the movable anvil-jaw for its reception.

N N' are a pair of uprights mounted at or beyond the respective ends of the way B and provided, respectively, with set-screws n n' .

O is a rock-arm pivotally mounted upon a suitable bracket o , secured to the framework of the machine, and the upper end of which

is connected by a link P with the front end of the shaft E.

Q is a face-plate or disk mounted upon a power-shaft R and provided with a pitman S, through which it communicates oscillatory movement to the rock-arm O.

The operation of the machine described will be readily understood. The springs g g' are quite heavy and strong and in the oscillatory movement of the rock-arm the carriage D and the shaft E normally move as one integral body without effecting any change in the relationship of the parts until the end of the stroke is nearly reached. Assuming the parts in the position shown in Figs. 1 and 2, in which position the carriage is assumed to have just delivered a length of wire to the shaping or forming instrumentalities, and is moving to the front of the machine, as indicated by the upper arrow in Fig. 1, to take a fresh hold upon the wire, it will be seen that the head of the trigger has reached a point opposite the depressed side i^2 in the lower edge of the follower, and that therefore the spring M has acted to force the movable anvil-jaw out of contact with the fixed anvil-jaw, and tilted the trigger on its pivot to carry the head of the trigger down the shoulder i' and into contact with the depressed surface i^2 of the follower, with the result that in the travel of the carriage the anvil-jaws pass along the opposite sides of the wire without taking hold thereof. When the movement of the carriage to the left, Figs. 1 and 2, has progressed until said carriage encounters the set-screw n , which encounter is timed to take place just before the rock-arm reaches the end of its outward stroke, the advance of the carriage and its lugs will instantly cease, but the slight continued advance of the rock-arm O will occasion the slight continued outward or forward movement of the shaft E (compressing the spring g') until the said rock-arm O reaches the end of its stroke. In the movement of the shaft E after the stoppage of the carriage, the tappet h' acts, through its contact with the lug i^x of the follower I, to advance said follower slightly, thereby forcing the incline or shoulder i' , formed in the lower edge of the follower, beneath or against the head of the trigger, with the result that the trigger will be tilted upon its pivot and drive or force the movable anvil-jaw against the fixed anvil-jaw, thereby locking or securing the wire between said anvil-jaws. As, in the continued rotation of the face-plate Q, the rock-arm O begins its return movement, the first part of the inward movement of the shaft E is taken up by the spring g' , which expands to its normal set or position, but does not affect the relationship of the follower to the trigger by reason of the fact that the distance between the fins of the tappets is slightly in excess of the thickness of the stud of said follower, and as soon as the equilibrium of the springs g g' is restored, the carriage, with the

anvil-jaws clamped upon the wire, moves to the right, Figs. 1 and 2, carrying the wire inward with it. Just before the rock-arm O comes to the end of its inward stroke the carriage encounters the set-screw n' and comes to rest, and the rock-shaft, in completing its inward movement, occasions a further slight inward movement of the shaft E, compressing the spring g , and in such continued inward movement the tappet h , which is then in contact with the stud of the follower, occasions a slight inward movement of the follower with relation to the body of the carriage, carrying the elevated face v^3 of the follower from beneath the head of the trigger, with the result that the pressure of the rear end of said trigger upon the movable anvil-jaw ceases, and the spring M immediately carries said movable anvil-jaw away from the fixed anvil-jaw, releasing the wire.

The movements of the parts described continue in the manner set forth during the operation of the machine.

The movements of the trigger on its pivot and of the movable anvil-jaw transversely of the machine are of course slight, slight movement only of said movable anvil-jaw being necessary to clamp and release the wire.

When it is desired to have the wire-feed mechanism run idly and without feeding the wire forward, as for instance, when the wire-forming instrumentalities are to be adjusted, or for any other reason, the handle k^2 may be manually thrown to carry the filling-block k^x out from beneath the acting face of the trigger (constituted by the set-screw j^x , as described) and the adjacent region of the end of the movable anvil-jaw, whereupon the slight movement imparted to the trigger will not be sufficient to carry it close enough to said movable anvil-jaw to occasion a clamping action upon the wire, and the trigger becomes idle, as shown in Fig. 7.

Having thus described my invention, I claim—

1. The combination, in a wire-feed mechanism, of a movable carriage, an anvil-jaw, a movable anvil-jaw, a device mounted on said carriage and adapted for longitudinal movement independently of said carriage, against the stress of springs, means for imparting movement to said device and through it to the carriage, stops which limit the movement of the carriage, and mechanism connective of said device and the movable anvil-jaw, substantially as set forth.

2. The combination, in a wire-feed mechanism, of a movable carriage, an anvil-jaw, a movable anvil-jaw, a shaft mounted on said carriage and adapted for movement independently of said carriage, against the stress of springs, means for imparting reciprocation to said shaft, stops which limit the movement of said carriage, a follower mounted in said carriage, a connection between said follower and said shaft, and a trigger through which movement of the follower is transmitted

to the movable anvil-jaw, substantially as set forth.

3. The combination, in a wire-feed mechanism, of a movable carriage, an anvil-jaw, a movable anvil-jaw, a shaft mounted on said carriage and adapted for movement independently of said carriage, against the stress of springs, means for imparting reciprocation to said shaft, stops which limit the movement of said carriage, mechanism connective of said shaft and the movable anvil-jaw, a follower mounted in said carriage and equipped with a shoulder, a connection between said follower and said shaft, and a trigger through which movement of the follower is transmitted to the movable jaw, substantially as set forth.

4. The combination, in a wire-feed mechanism, of a movable carriage, an anvil-jaw, a movable anvil-jaw, a shaft mounted on said carriage and adapted for movement independently of said carriage, against the stress of springs, means for imparting reciprocation to said shaft, stops which limit the movement of said carriage, mechanism connective of said shaft and the movable anvil-jaw, a follower provided with a shoulder mounted in said carriage, a connection between said follower and said shaft, and a trigger in contact with the follower and adapted to make contact with the movable anvil-jaw, substantially as set forth.

5. In a wire-feed mechanism, the following elements in combination: the movable carriage, the anvil-jaw, the movable anvil-jaw, the trigger, the follower, the shaft mounted in said carriage, the springs which control said shaft, means for imparting reciprocation to said shaft, a loose connection between said shaft and the follower, and stops which limit the movement of the carriage, so that its travel is shorter than the travel of the shaft, substantially as set forth.

6. In a wire-feed mechanism, the following elements in combination: the movable carriage, the anvil-jaw, the movable anvil-jaw, the spring engaged with said movable anvil-jaw, the trigger adapted to make contact with said movable anvil-jaw, the follower having a side formed with surfaces or edges in different planes, the shaft mounted in the carriage, means for imparting reciprocation to said shaft, a loose connection between said shaft and follower, and stops which limit the movement of the carriage, so that its travel is shorter than the travel of the shaft, substantially as set forth.

7. In a wire-feed mechanism, the following elements in combination: the way, the carriage, the fixed anvil-jaw, the movable anvil-jaw, a follower having a stud or projection and formed with a side having surfaces in different planes, a pivoted trigger one end of which is adapted to make contact with said follower and the other adapted to make contact with the movable anvil-jaw, a shaft mounted in said carriage, springs which con-

trol the shaft, devices mounted on said shaft to loosely engage the stud of the follower, means for imparting reciprocation to the shaft, and stops which limit the movement of the carriage so that its travel is less than the travel of the shaft, substantially as set forth.

8. In a wire-feed mechanism, the following elements in combination: the movable carriage, the fixed anvil-jaw, the movable anvil-jaw, a spring engaged in said movable anvil-jaw, a follower formed with a side having surfaces in different planes, a pivoted trigger one end of which is adapted to make contact with said follower, and the other adapted to make contact with the movable anvil-jaw, a shaft mounted in said carriage, springs which control the shaft, devices to loosely connect the shaft to the follower, means for imparting reciprocation to the shaft, and stops which limit the movement of the carriage, substantially as set forth.

9. In a wire-feed mechanism, the following elements in combination: the carriage, the fixed anvil-jaw, the movable anvil-jaw, a spring engaged in said movable anvil-jaw, a follower formed with a side having surfaces in different planes, and having an upwardly-projecting stud, a pivoted trigger one end of which is adapted to make contact with said follower and the other adapted to make contact with the movable jaw, a shaft mounted in bearings formed in lugs on said carriage, springs mounted on said shaft and bearing against a lug and against nuts mounted on said shaft, a pair of tappets mounted on said shaft and provided with fins which depend on opposite sides of the stud of the follower, means for imparting reciprocation to the

shaft, and stops which limit the movement of the carriage, substantially as set forth.

10. In a wire-feed mechanism, the following elements in combination: the carriage, the fixed anvil-jaw, the movable anvil-jaw, a trigger having a limited pivotal movement and one end of which is adapted to make contact with said movable jaw to force it toward the fixed jaw, means for actuating said trigger, a spring engaged with said movable jaw and tending to force it away from said fixed jaw, and a filling-block mounted on said movable jaw to receive the impact of the trigger, and adapted to be moved out of range of the trigger, substantially as set forth.

11. In a wire-feed mechanism, the following elements in combination: the carriage, the fixed anvil-jaw, the movable anvil-jaw, a trigger having a limited pivotal movement, and one end of which is adapted to make contact with the outer end of said movable jaw to force it toward the fixed jaw, means for actuating said trigger, a spring engaged with said movable jaw and tending to force it away from said fixed jaw, a stud or shaft mounted on the movable jaw, and a filling-block pivotally mounted on said stud or shaft and adapted to be swung on said stud or shaft to a position on the end of the movable jaw, to receive the impact of the trigger and to increase the length of said movable jaw, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 13th day of March, A. D. 1896.

JOHN WM. GRANGER.

In presence of—

J. BONSALE TAYLOR,
A. E. PAIGE.