

(No Model.)

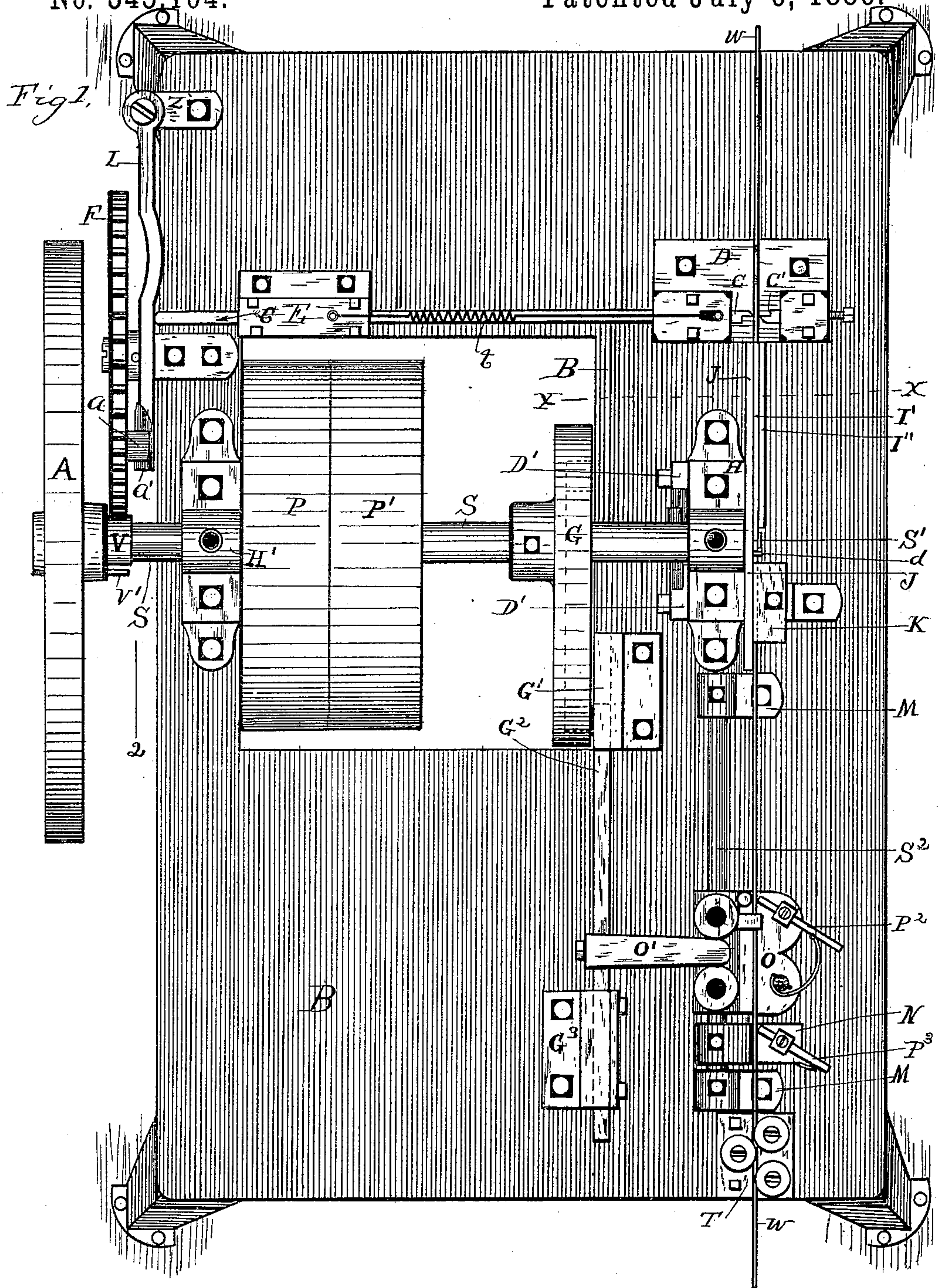
2 Sheets—Sheet 1.

C. B. BRAINARD.

MACHINE FOR MAKING STAYS FOR WIRE FENCES.

No. 345,104.

Patented July 6, 1886.



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Fig. 2.

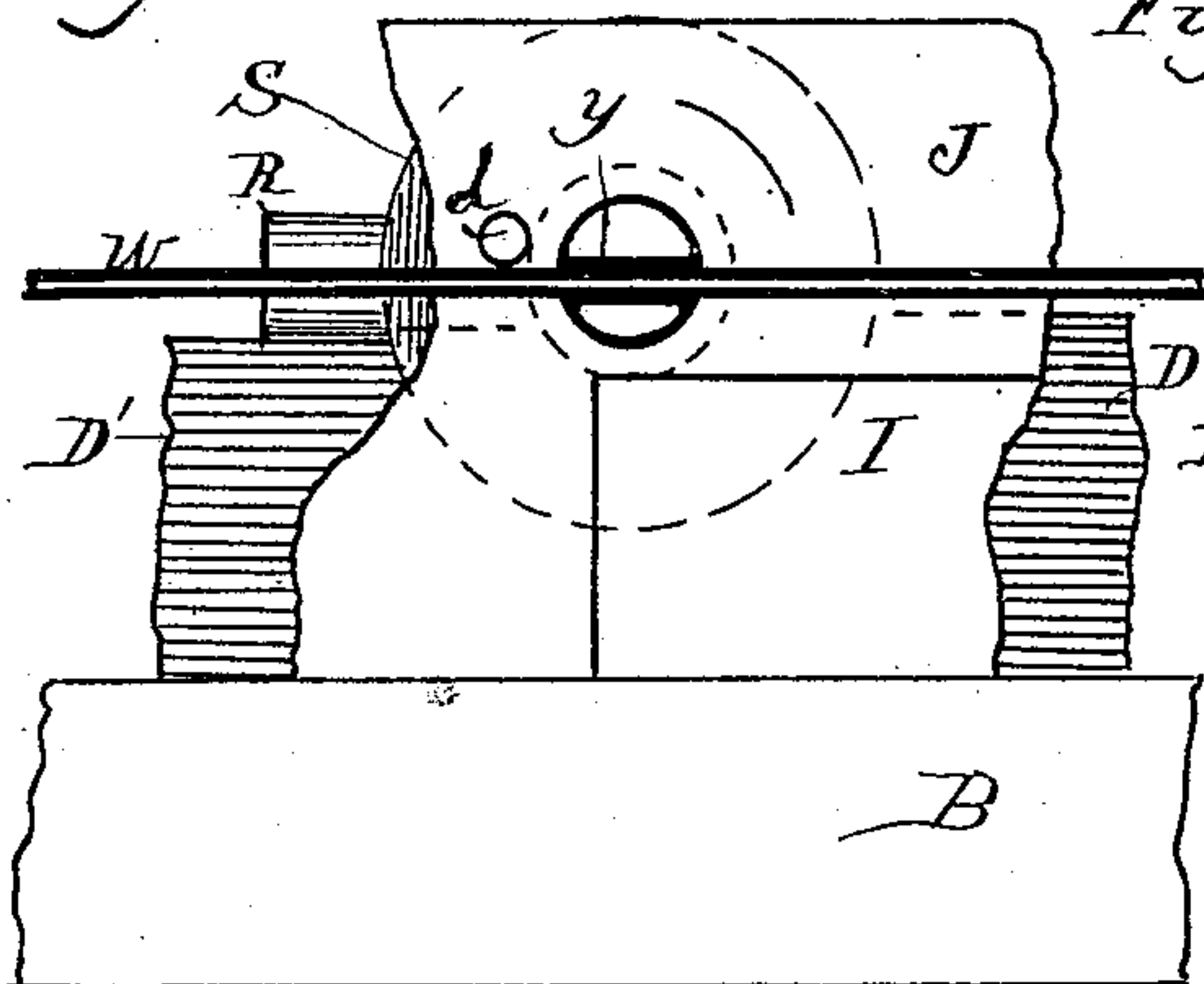


Fig. 3.

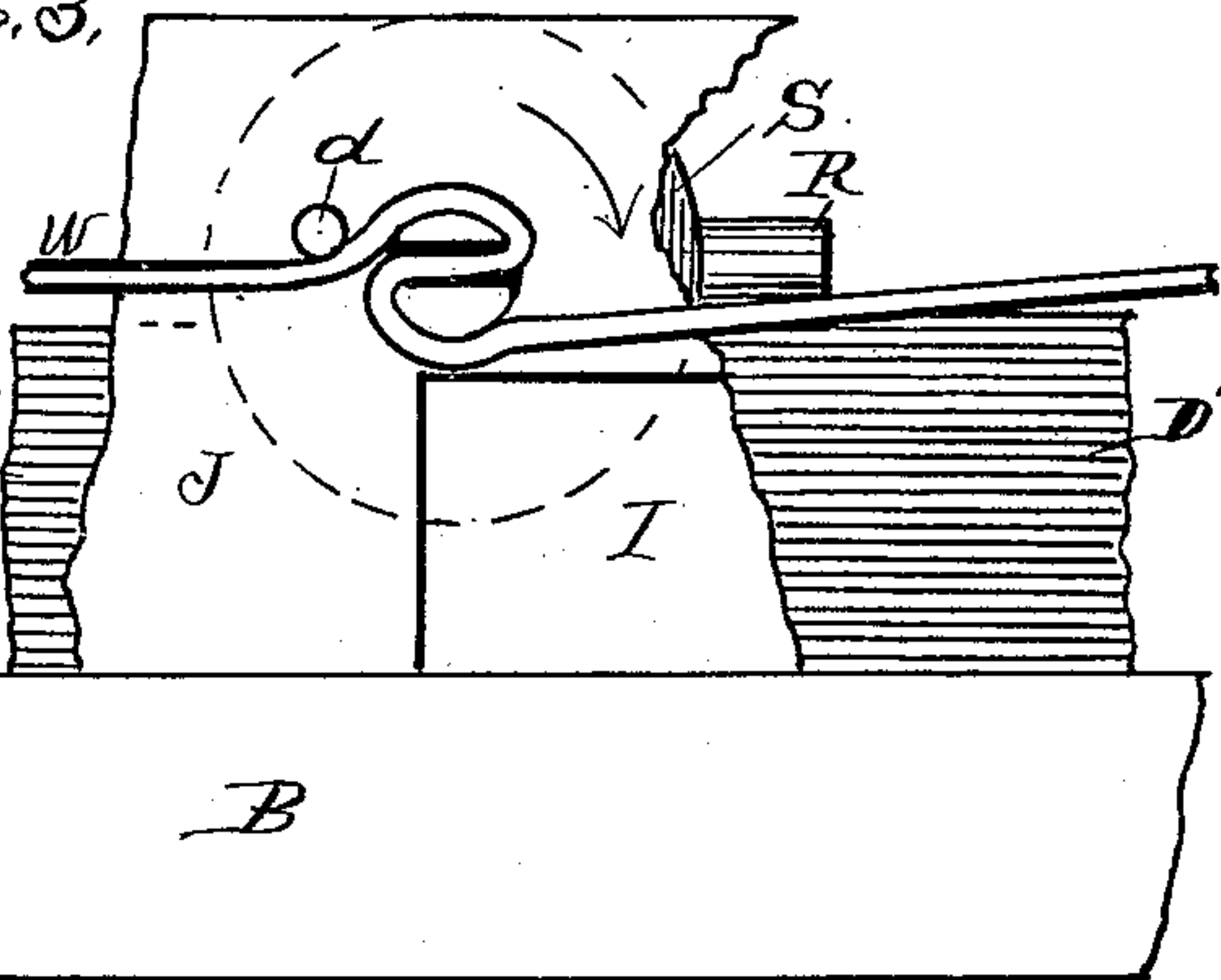


Fig. 4.

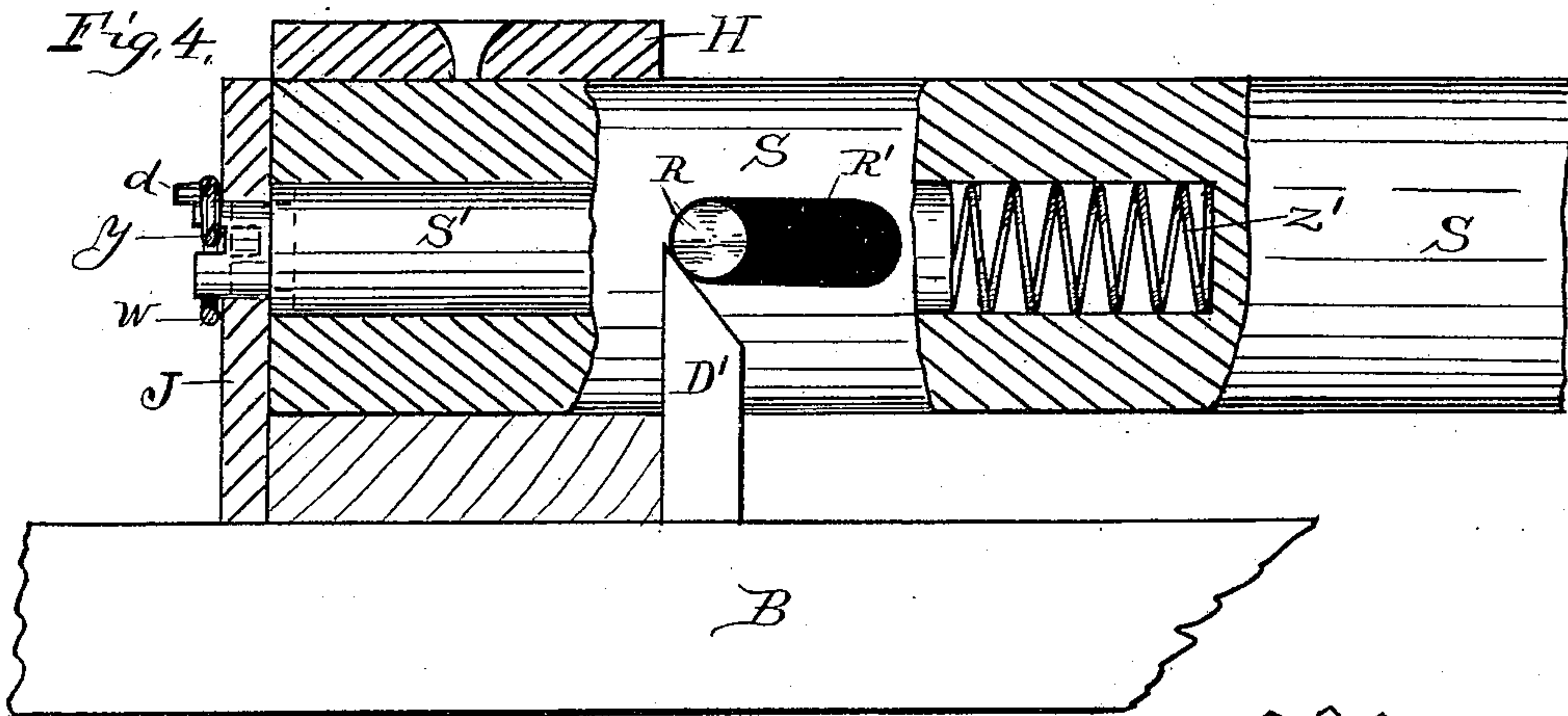


Fig. 5.

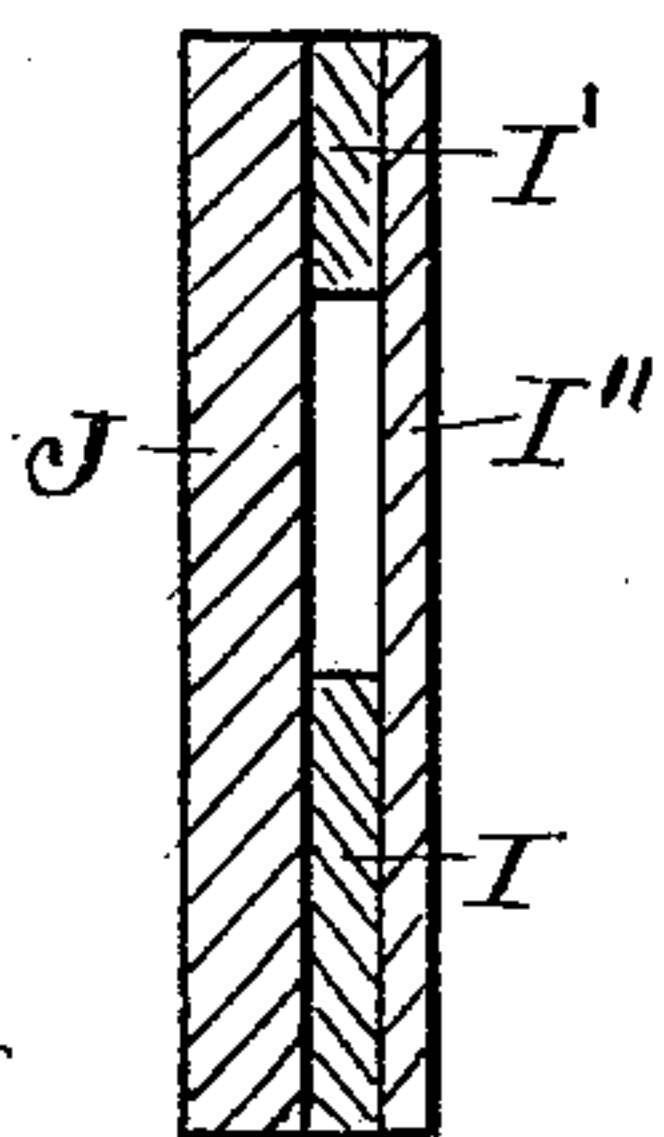


Fig. 6.

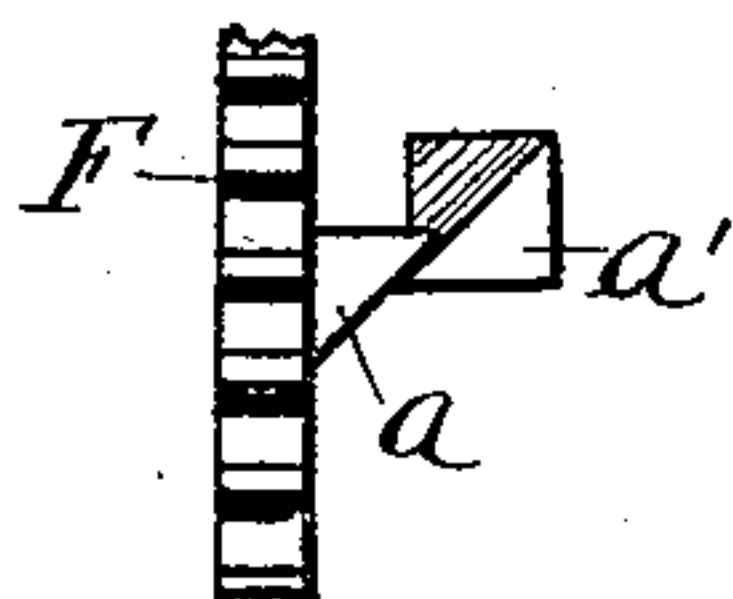


Fig. 7.

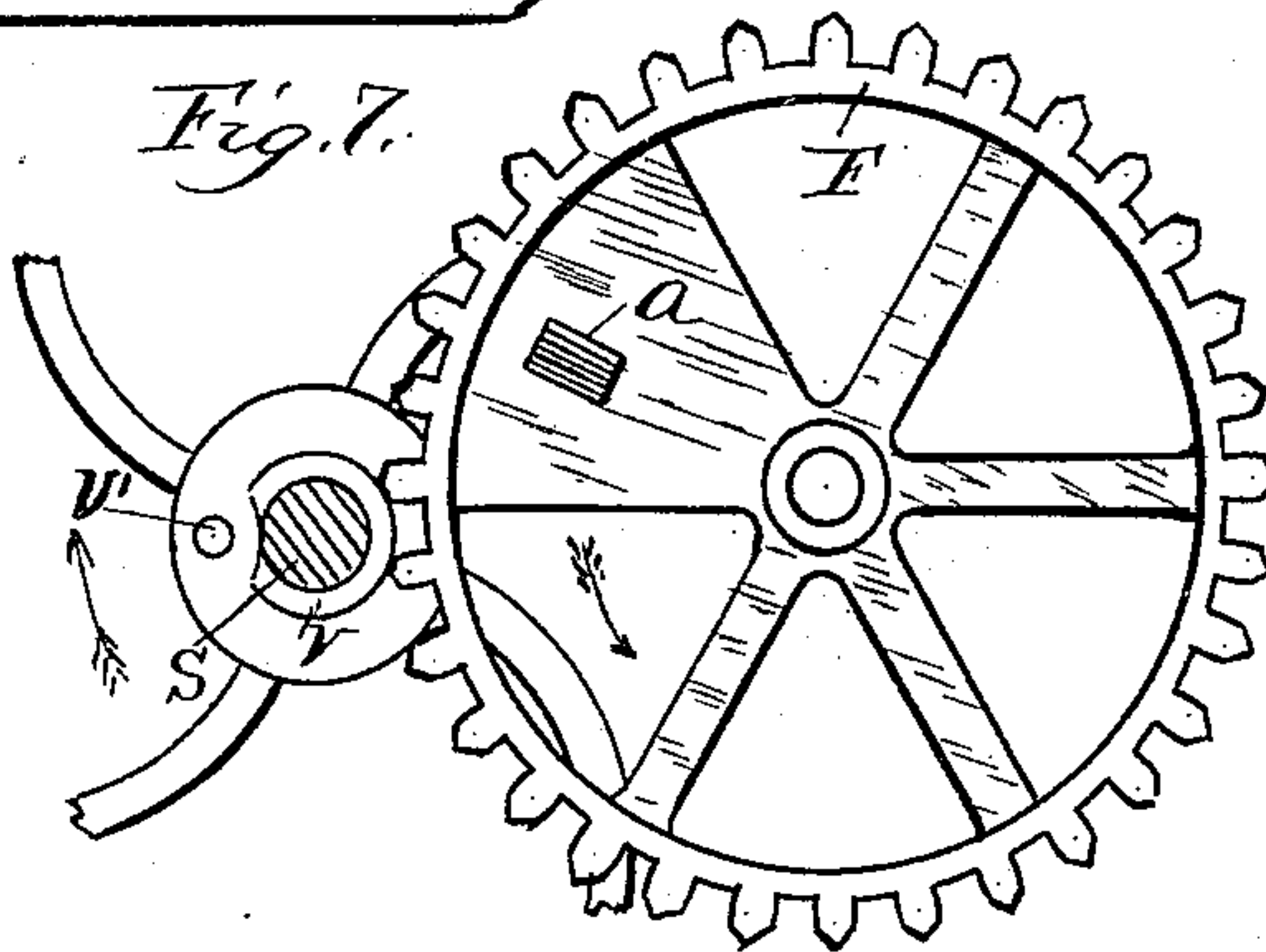


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MAKING STAYS FOR WIRE FENCES.

SPECIFICATION forming part of Letters Patent No. 345,104, dated July 6, 1886.

Application filed April 26, 1886. Serial No. 200,171. (No model.)

*To all whom it may concern:*

Be it known that I, CURTIS B. BRAINARD, a citizen of the United States of America, residing at Joliet, in the county of Will and State of Illinois, have invented certain new and useful Improvements in Machines for Making Stays for Wire Fences, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain improvements in machines for making stays from wire for wire fences by forming loops therein for holding the strand-wires of a wire fence, the construction and operation of which is fully set forth in the following specification and claims, reference being had to the drawings hereto annexed, forming a part of this specification, in which—

Figure 1 is a top plan view of the machine. 20 Fig. 2 is a detailed view looking toward the end of the drive-shaft of the machine, showing the recessed end of the spring-plunger, which is arranged in and rotates and reciprocates therein, also showing the stay-wire in the recess of said plunger before it has rotated to form the bend in the wire. Fig. 3 is a similar view showing the wire after the plunger has rotated and formed the bend in the wire. Fig. 4 is a detailed and partially sectional 30 view of the end of the drive-shaft, having arranged therein the spring-plunger, a cross-section of its supporting-box and of a face-plate having a stationary bending-pin, and an end view of the stationary cam for withdrawing the spring-plunger from the completed bend in the stay-wire. Fig. 5 is a vertical cross-sectional view of the several plates for guiding the wire out of the machine after it is looped, and for assisting the rotating spring-plunger in forming said bend, said view being 40 taken on line *x* of Fig. 1. Fig. 6 is a face view of a section of the periphery of the intermittingly-rotating notched wheel for operating the cutters for cutting off the wire in lengths, and showing an integral cam-lug on one side for operating the lever that reciprocates one of said cutters; and Fig. 7 is a side view of said notched wheel, a cross-section of the drive-shaft, and a view of the inner end 50 of the fly-wheel hub and a portion of the

spokes of said wheel, said view being taken on line 2 of Fig. 1; and Fig. 8 is a view of the finished product of the machine.

Referring to said drawings, B represents the bed of the machine, having a supporting- 55 leg at each corner.

S is the drive-shaft, arranged in the boxes H and H', and has fixed thereon a fly-wheel, A, the fast pulley P, to which the power is applied, the loose pulley P', and the cam-wheel 60 G, having a side cam-channel.

F is an intermittingly-rotating notched wheel pivoted to a stud on the side of the machine-bed, and set so that the hub V of the fly-wheel A will rotate between two of its 65 teeth, as shown in Figs. 1 and 7, the ends of the teeth of said wheel being formed to fit the contour of said hub, and has a cam-lug, *a*, integral with its side toward the machine-bed, for operating the cutters. Said notched wheel 70 only rotates intermittingly. This is caused by the manner in which it is connected with said hub. The hub V rotates between two teeth of said wheel until the pin V', arranged on the side of the adjacent larger portion of 75 said hub, comes in contact with a tooth of wheel F, carrying it forward two teeth, which is permitted by means of the said hub being cut away between it and said pin, so that wheel F can rotate while pin V' is engaged with a 80 tooth. When the pin leaves its tooth, said wheel cannot rotate again until again engaged by said pin. Figs. 1 and 7 show this construction and arrangement.

G<sup>2</sup> is a reciprocating slide arranged in the 85 boxes G' and G<sup>3</sup> on the top of bed B, and is provided with a roller-wrist for operating in the side cam-channel of wheel G. Said reciprocating slide is provided with the horizontal arm O', to lie between a pair of vertical lugs 90 on the reciprocating feed-carriage O, by means of which feed-carriage the wire W is intermittingly fed forward into the machine the required length.

S<sup>2</sup> is a guide-rod, upon which said feed-carriage reciprocates, and is secured to the bed B by means of the boxes M M.

T is a set of straightening-rolls for straightening the wire W as it passes along between them and is fed forward.



P<sup>2</sup> is a spring-dog pivoted on said carriage, and grips the wire W when the carriage moves forward to carry the wire with the carriage.

P<sup>3</sup> is a stationary spring-dog arranged on block N, secured to the outer end of guide-rod S<sup>2</sup>, for preventing backward movement of the wire when the carriage returns.

L is a lever pivoted at its rear end to the plate Z, secured to and extending over the side of the machine-bed, so the said lever will lie on a line immediately beyond the line of the bed, and has its front end supported loosely on a similar plate, so that the front end of said lever may have lateral movement. The side of said lever toward the machine engages with the outer end of the reciprocating cutter C. The front end of said lever is beveled at a', as shown in Figs. 1 and 6, to correspond with the bevel of lug a of wheel F, by means of which lug a said lever is operated laterally at its outer end to reciprocate the cutter C whenever the rotation of said wheel brings said lug and lever in contact. The cutter C is secured to the top of bed B in the boxes D and E, and is held engaged with lever L by means of the coil-spring t, connected at one end to box E, and at its opposite end to an integral pin of reciprocating cutter C, protruding through a slot in the box D, as shown in Fig. 1.

C' is a stationary cutter secured to the top of the bed by means of a cap-plate on box D, and is arranged to cut in conjunction with reciprocating cutter C, as shown in said figure.

The front end of shaft S is hollow for the reception of the reciprocating plunger S' and coil-spring Z', as shown particularly in Fig. 4. Said plunger is secured in place by means of the pin R, secured thereto by being screwed into a tapped hole in the side thereof, and protruding out through a longitudinal slot, F', in said shaft. When said shaft rotates, said plunger rotates with it, and is caused to reciprocate by means of its pin R engaging with a stationary cam, D', located below said shaft and next the inner side of its box H, as shown in said figure. The tendency of said coil-spring is to force the said plunger forward and cause its outer recessed end to protrude beyond the end of shaft S. The said plunger is provided with a recess across its front end for the reception of the strand-wire W, as shown in Figs. 2, 3, and 4.

J is a vertically-arranged plate arranged to stand at the outer side of shaft-box H in front of the end of shaft S, and extending from the feed-carriage box M to the box D, holding the cutters C C', as shown in Figs. 1, 2, 3, and 4. The front or outer recessed end of plunger S' is arranged to protrude through a corresponding opening in said plate, and rotates and reciprocates therein. Said plate forms a backing for and assists to guide the wire W in its passage from the feed to the cutters.

I is a plate arranged to stand at the side of plate J, and extends from the cutters to a point a little past the center of and under the recessed end of the plunger S', as shown in Figs.

2 and 3. This plate I serves to assist in supporting the wire up to and under the end of the plunger, while the operation of bending the wire is being performed by the plunger, and forms the bottom of a guide-channel to conduct the bent wire out of the machine.

I' is a similar plate to I, and is arranged immediately above it at the side of plate J, to form the upper wall of said guideway, and I'' is a cap-plate covering said plates to form the outer wall of said guideway. The relative position of these four plates with reference to each other is shown particularly in Fig. 5.

K is a guide-plate arranged to stand between the feed-carriage and plunger, and has a guide-channel on its side next plate J, for the reception of and as a guide for the wire in its passage from the feed-carriage to the plunger, and is held in place on the bed B by means of a set-screw at its foot, as shown in Fig. 1.

The face of plate J is provided with a stationary pin, d, arranged to stand between the feed-carriage and the plunger, near said plunger, and on a line a little above its center, as shown in Figs. 2 and 3, which pin assists in holding the wire W while the plunger rotates to bend the wire.

The operation of the machine is substantially as follows: The feed-carriage O in its reciprocations feeds forward the wire W each time as far as it is desired to form the bends therein apart. The parts of the machine are so adjusted with relation to each other that when the feed-carriage begins to move forward to feed in wire the plunger S' is withdrawn into the shaft S by means of its pin R engaging with stationary cam D', and is disengaged from the wire W. When the feed-carriage returns, the form of cam D' permits the plunger S' to move out of shaft S and plate J, so the wire will lie in the recess in and across the end of the plunger, as shown in Fig. 2. By the time the feed-carriage is ready to move forward again the plunger S' has rotated one-half way around with the wire in its recess and in the direction the wire is fed in, by means of which the wire is bent in the form shown in Fig. 3. The instant it is so bent, and the carriage is ready to move forward, plunger S' is withdrawn into the shaft S, and, from its contact with the wire, by means of its pin R engaging with cam D', is held disengaged until the feed-carriage is ready to return, when the plunger again emerges to grasp the wire and bend it and withdraws, as before. The recess across the end of the plunger is arranged a little to one side of the center, so as to form the space in one bend of the wire a little larger than the other, the larger one being designed for the reception of the wires of the fence to which it may be applied. When the stay-wire has thus been provided with a series of equidistant loops or bends, and is long enough for the purpose intended, the cutters C C' close on it, cut it off, and then separate to permit the next succeeding stay to move for-



ward between them, to be in like manner cut off at the proper length.  $P^2$  and  $P^3$  are spring-dogs for gripping the wire between their engaging edges and a fixed stud, as shown in Fig. 1. Dog  $P^2$  is located on the reciprocating carriage O, and dog  $P^3$  is located in a fixed position in the rear of said carriage, as before stated, on the said block N. These dogs are made from a square rod of steel, cut square across at each end, so as to form eight engaging edges, and are set in rotatable studs having set-screws for adjustably holding them therein, as shown in said figure. By reversing them and rotating them each one of their eight engaging edges may in turn be brought to engage the wire, so that they need not be sharpened as often as a dog having but one engaging edge and will last eight times as long.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is as follows, to wit:

1. In the machine shown and described for making stays for wire fences, and in combination with the bed B, the hollow shaft S, having the side slot,  $R'$ , reciprocating and rotating spring-plunger  $S'$ , located within the hollow of said shaft, and having the recess across its outer end, pin R, cam  $D'$ , reciprocating wire-feed O, and guide-plates I,  $I'$ ,  $I''$ , J, and K, as and for the purpose set forth.

2. In the machine shown and described for making stays for wire fences, the hollow shaft S, having slot  $R'$ , in combination with the spring-plunger  $S'$ , having the recess across its outer end and adapted to reciprocate within said shaft and rotate therewith, substantially as and for the purpose set forth.

3. In the machine shown and described for making stays for wire fences, the combination of the notched wheel F, having the inclined lug  $a$ , shaft S, hub V, pin  $V'$ , lever L, having the inclined portion  $a'$ , and the cutters C and  $C'$ , substantially as and for the purpose set forth.

4. In the machine shown and described for making stays for wire fences, the combination

of the hollow shaft S, having slot  $R'$ , spring-plunger  $S'$ , having the recess at its extending end, pin R, and the stationary cam  $D'$ , substantially as and for the purpose set forth.

5. In the machine shown and described for making stays for wire fences, and in combination with the several wire-guides thereof, the shaft S, spring-plunger  $S'$ , recessed across its extending end, and plate J, having the stationary pin  $d$ , substantially as and for the purpose set forth.

6. In the machine shown and described for making stays for wire fences, the hollow shaft S, having the longitudinal slot  $R'$ , in combination with the spring-plunger  $S'$ , having the pin or stud R, for operating in said slot  $R'$ , and stationary cam  $D'$ , substantially as and for the purpose set forth.

7. In the machine shown and described for making stays for wire fences, the combination, with the reciprocating carriage O, of the spring-dog  $P^2$ , formed from a square rod or bar of steel and adapted to be rotated and changed end for end, substantially as and for the purpose set forth.

8. In the machine shown and described for making stays for wire fences, the combination of the reciprocating carriage O, stationary block N, and spring-dogs  $P^2$  and  $P^3$ , each formed from a square rod or bar of steel and adapted to be rotated and changed end for end, substantially as and for the purpose set forth.

9. In the machine shown and described for making stays for wire fences, and in combination with the bed B, the reciprocating feed-carriage O, the hollow shaft S, the reciprocating and rotating spring-plunger  $S'$ , located within the said shaft, and having the cross-recess in its outer end, the wire-cutters C and  $C'$ , and the means, substantially as shown and described, for operating said parts, as and for the purpose set forth.

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