

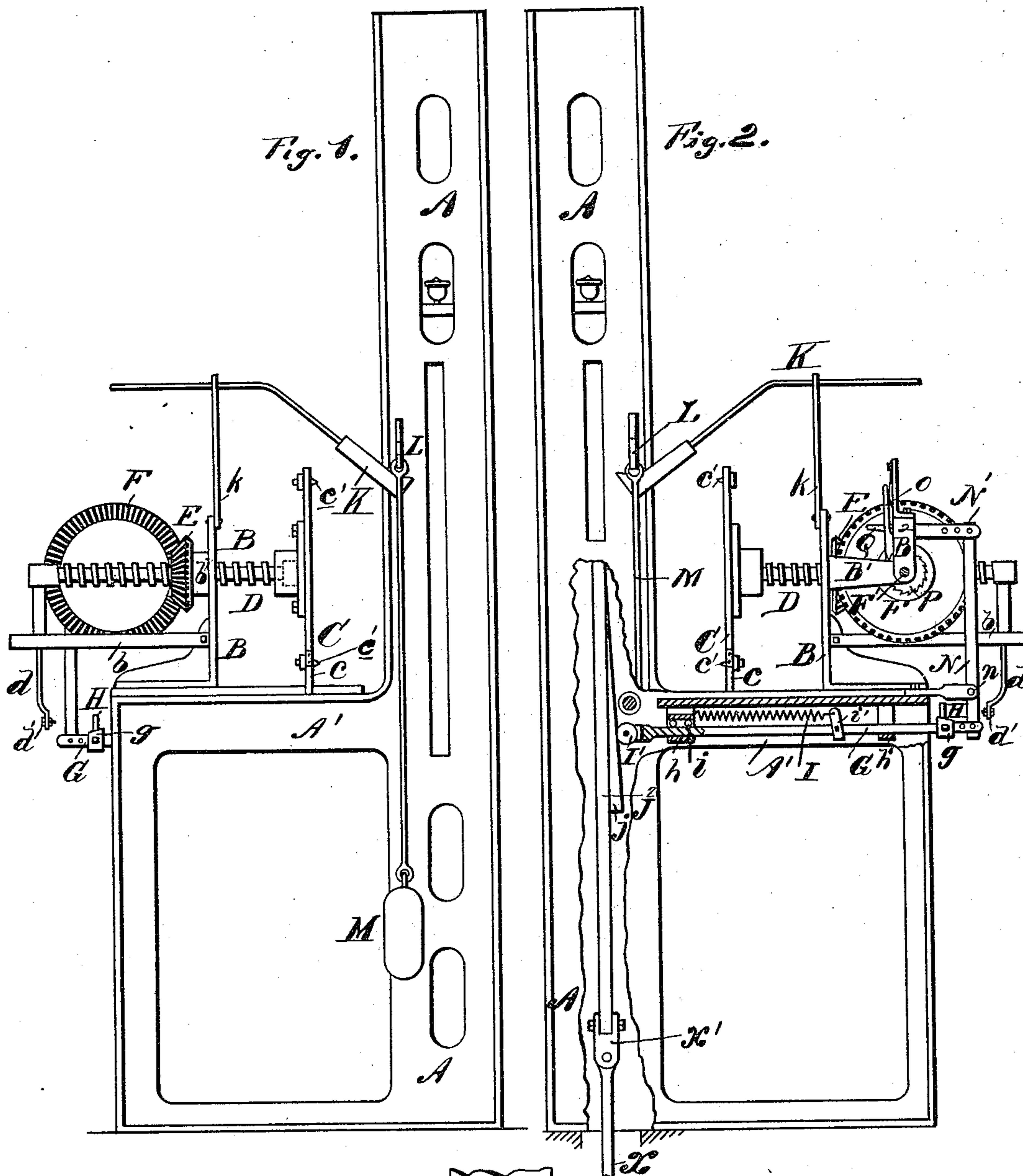
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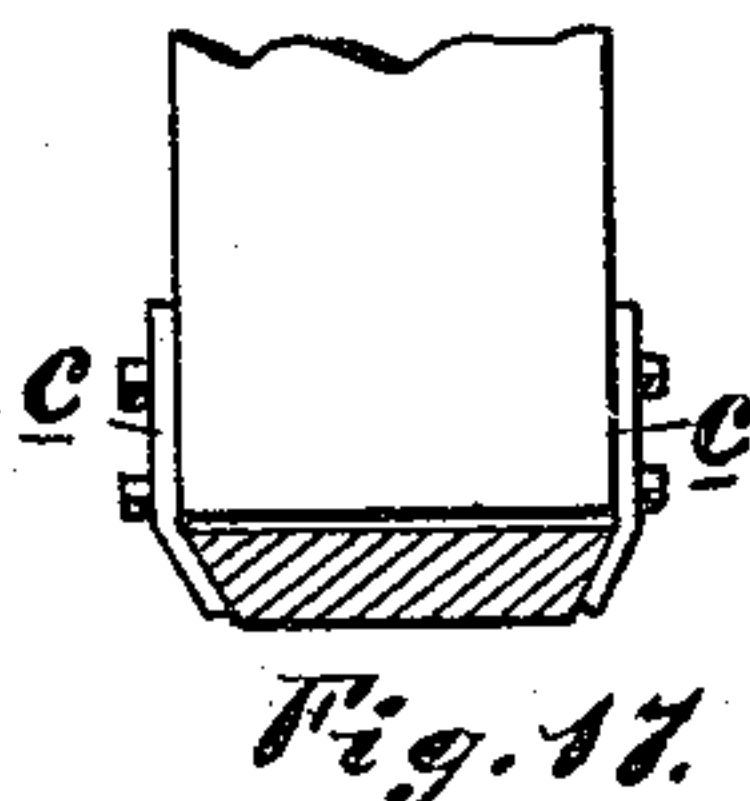
C. G. SMITH.
EXCELSIOR CUTTING MACHINE.

No. 447,846.

Patented Mar. 10, 1891.



WITNESSES
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M. E. Reunt.



INVENTOR
Charles G. Smith

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Fig. 3.

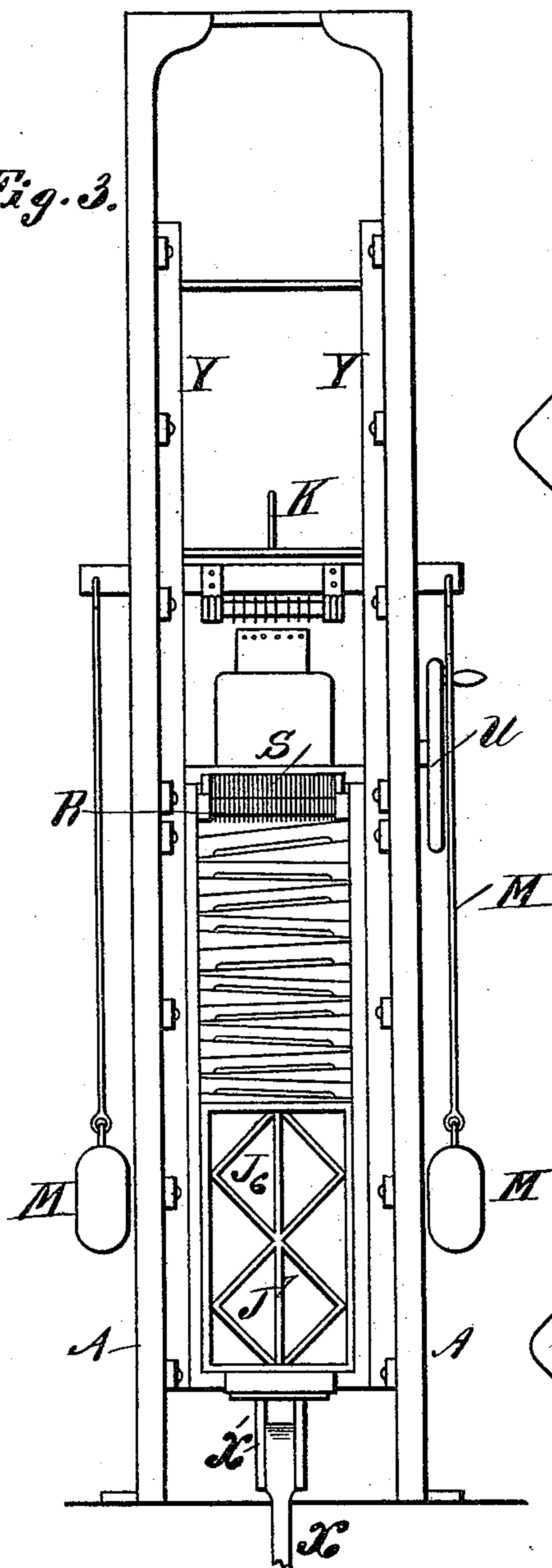


Fig. 4.

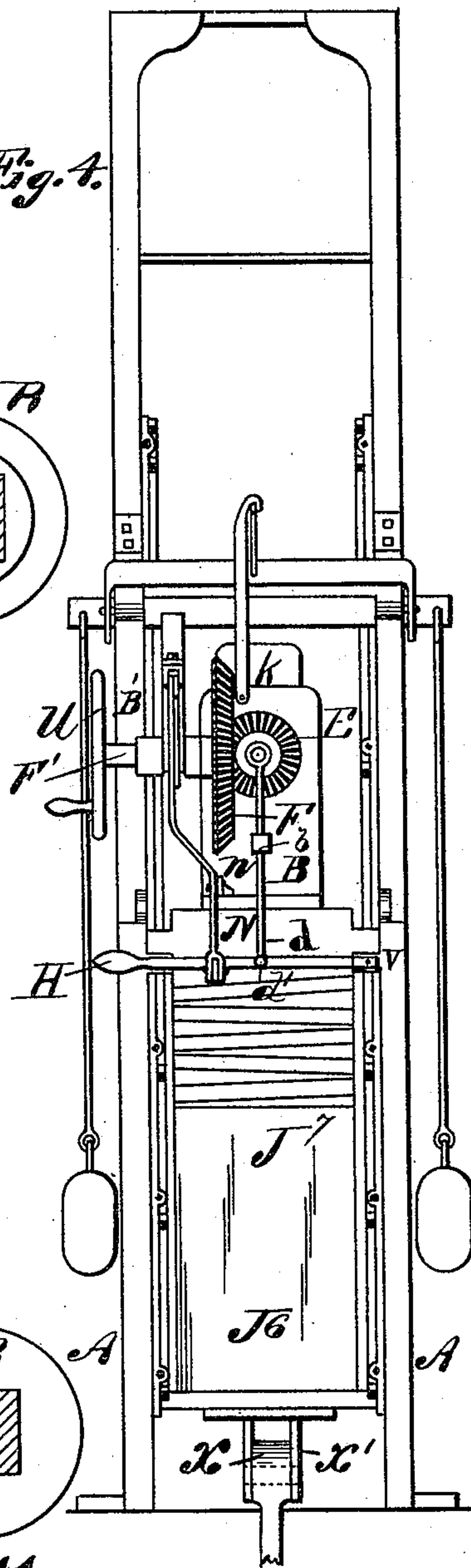


Fig. 10.

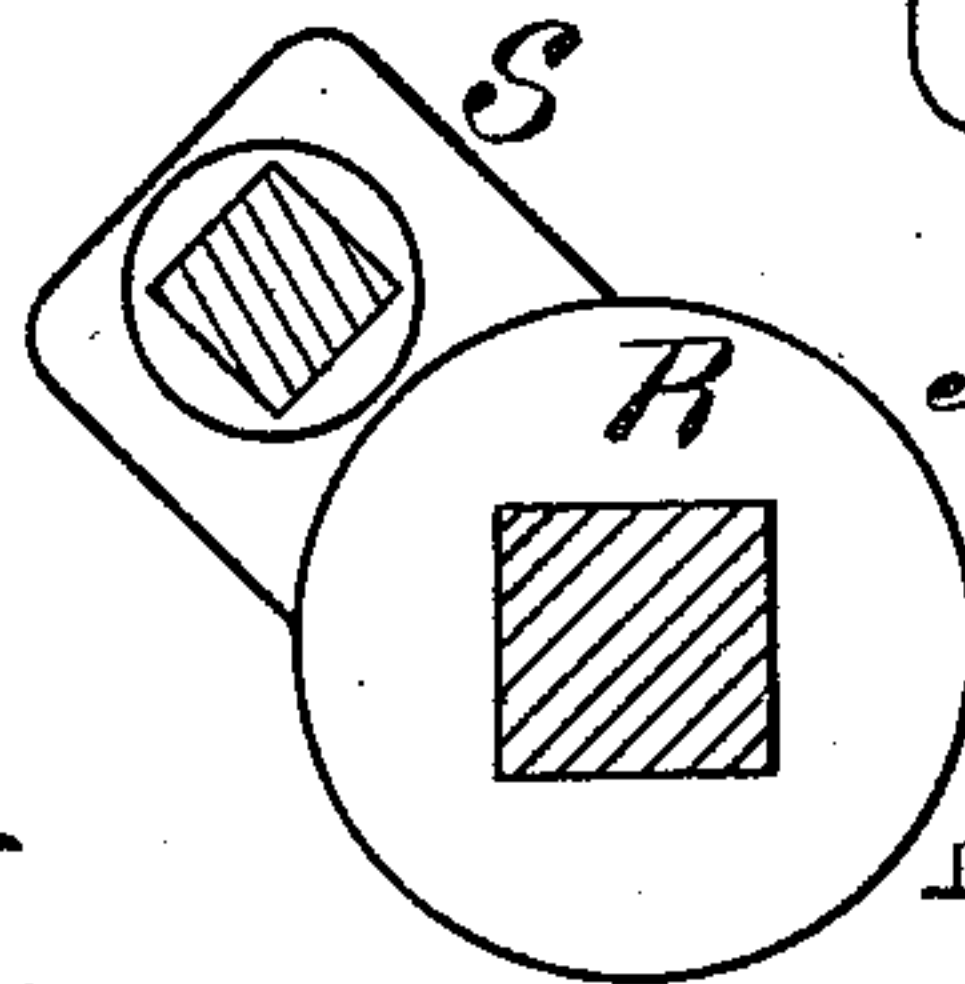
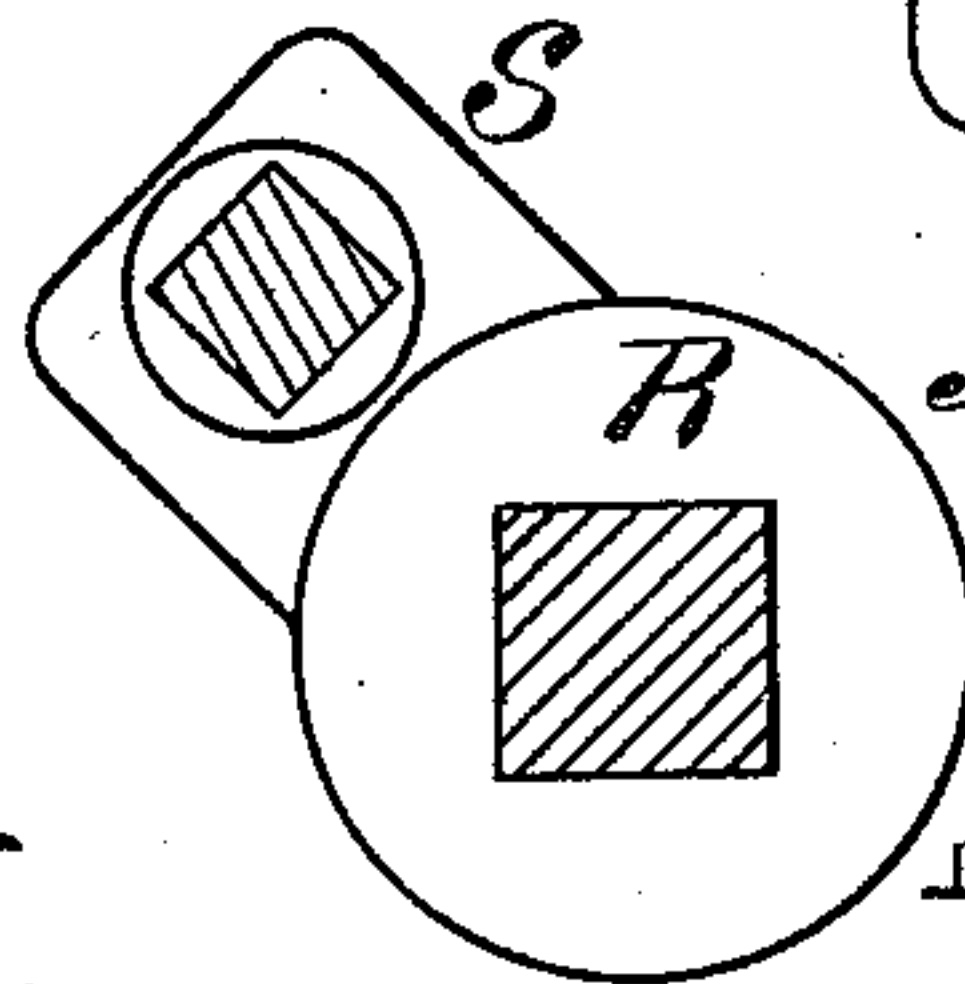


Fig. 11.



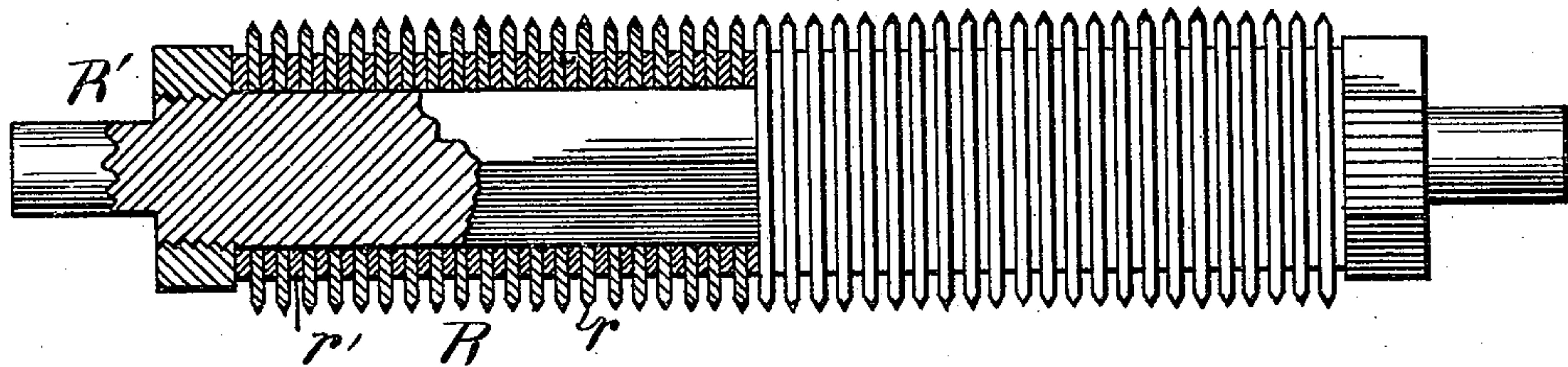
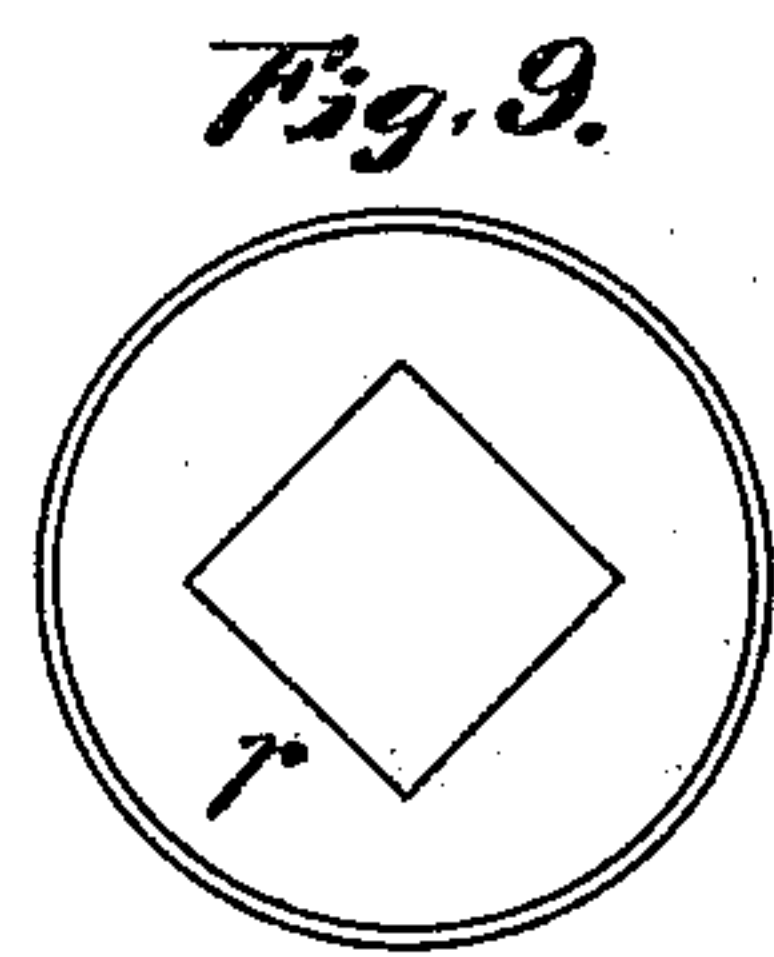
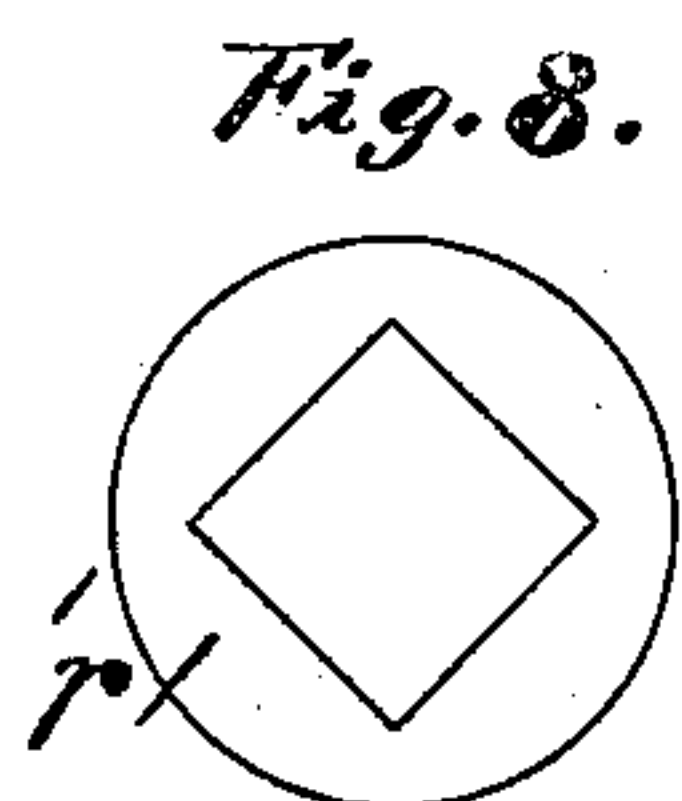
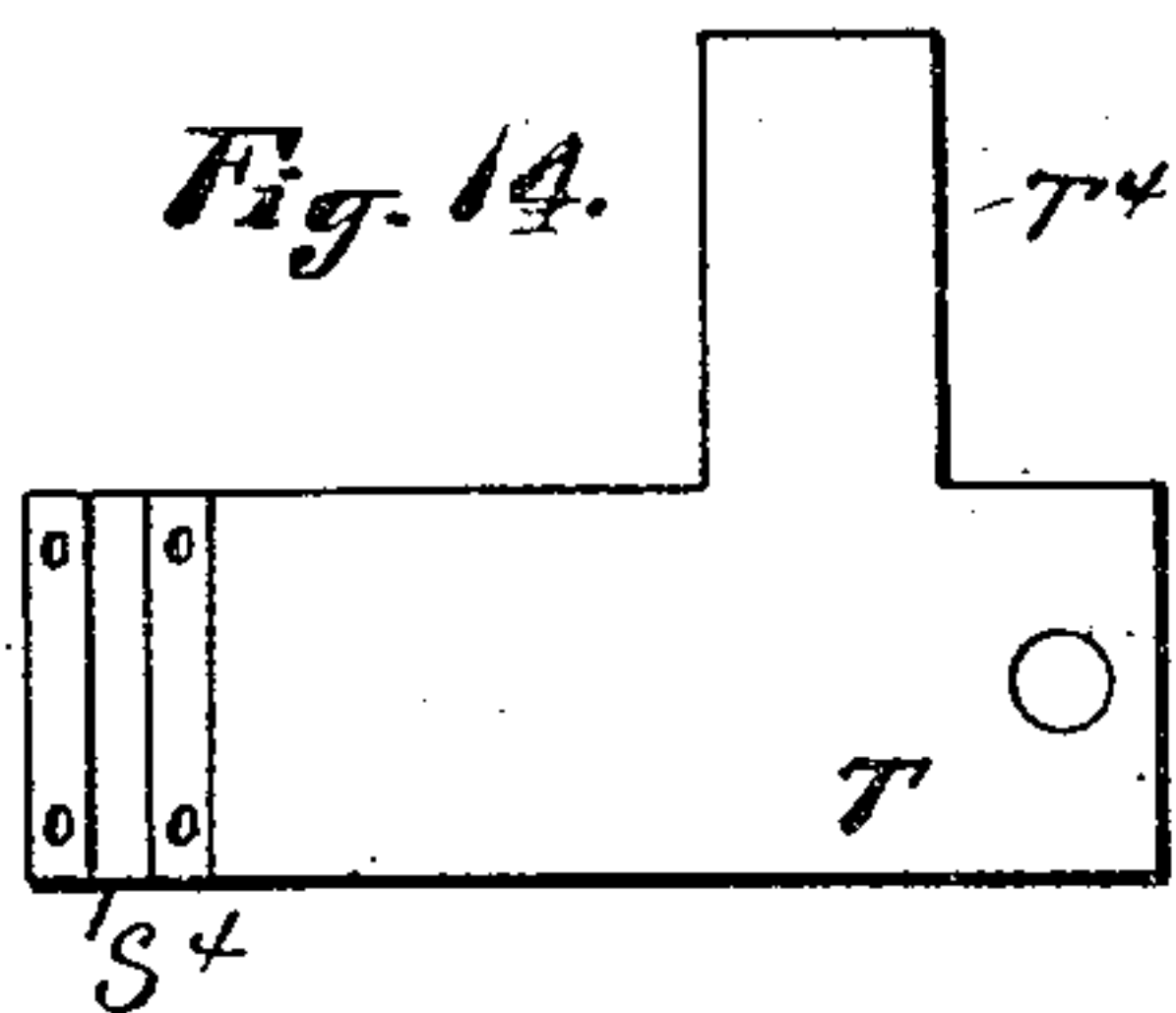
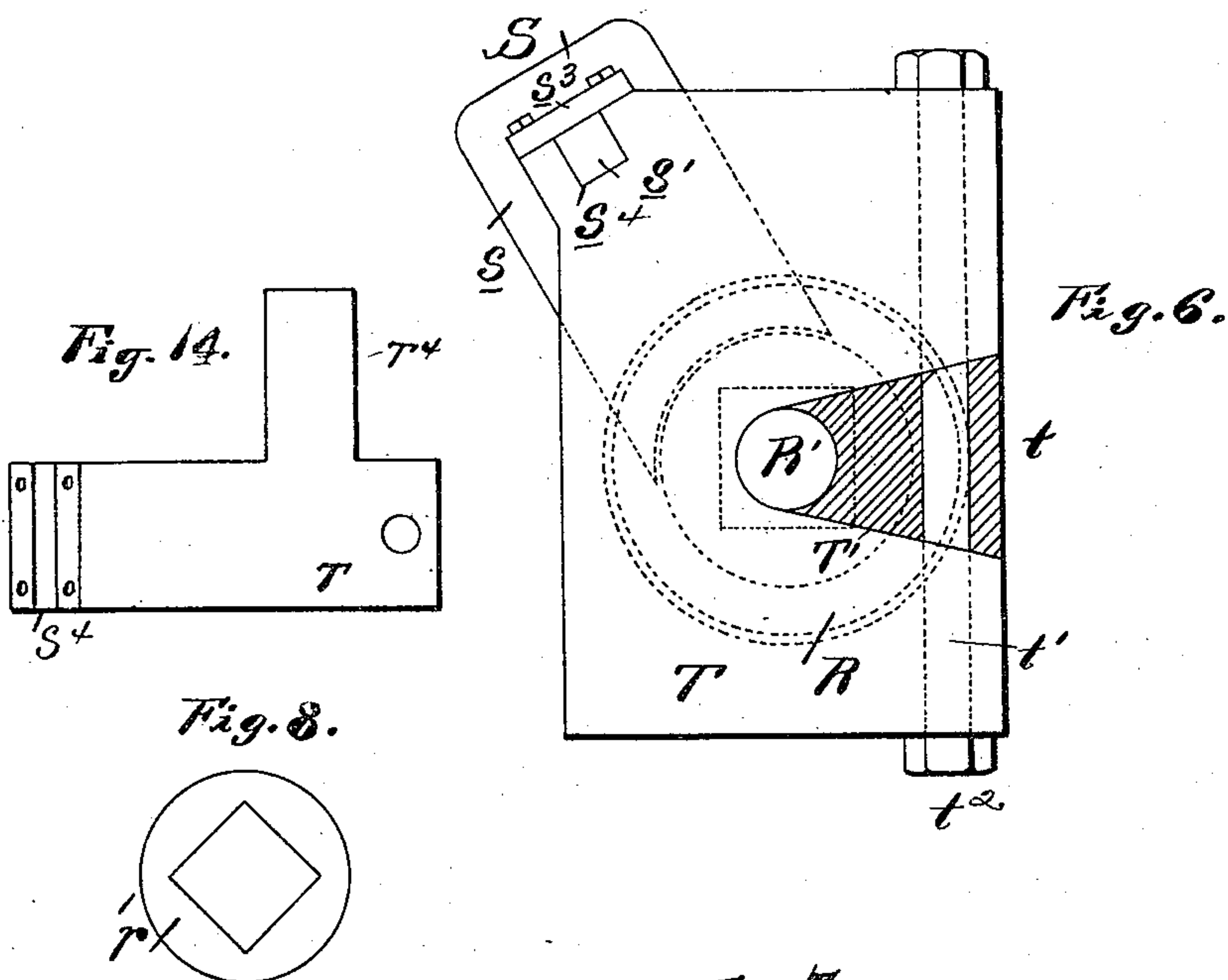
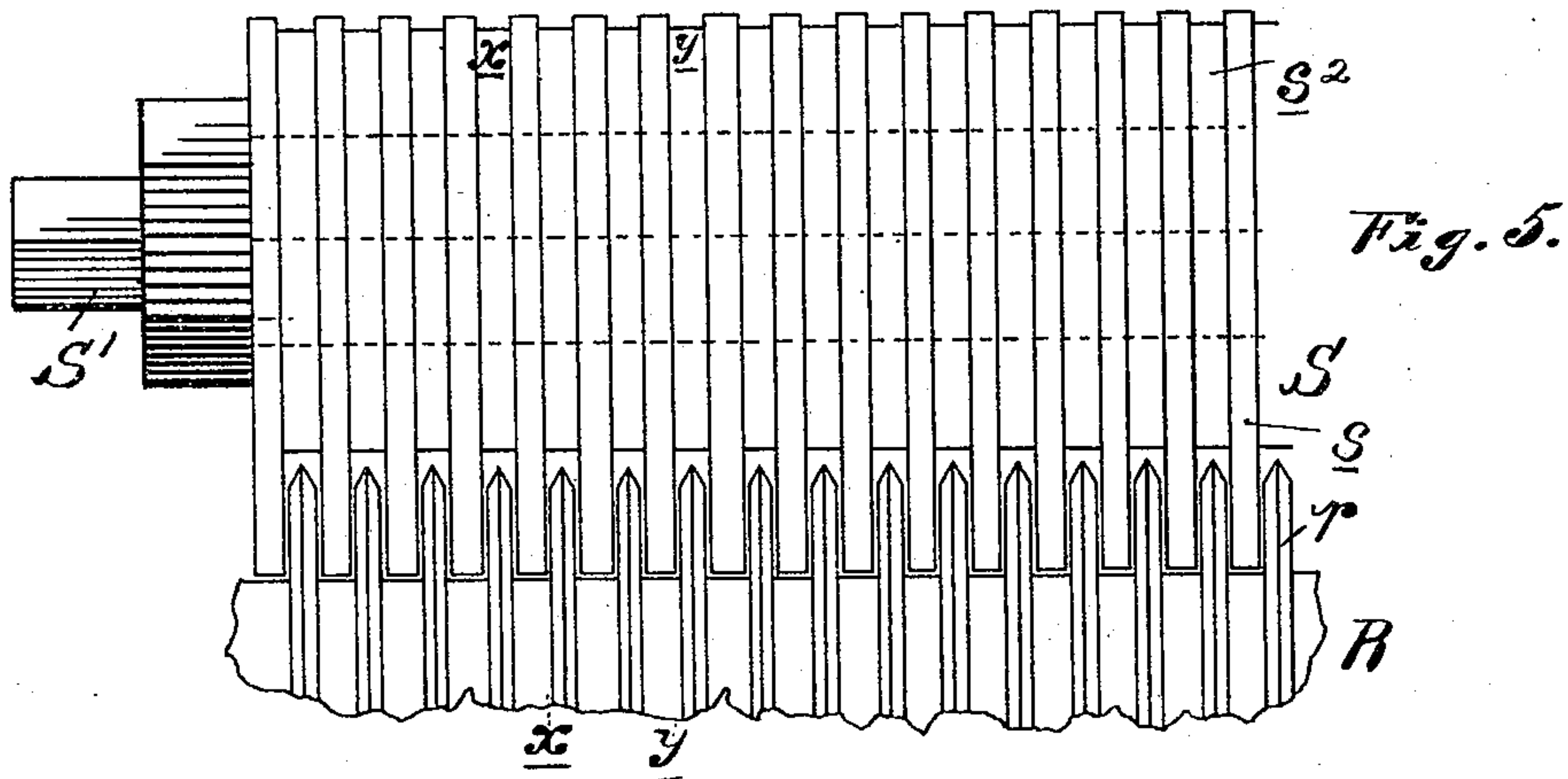
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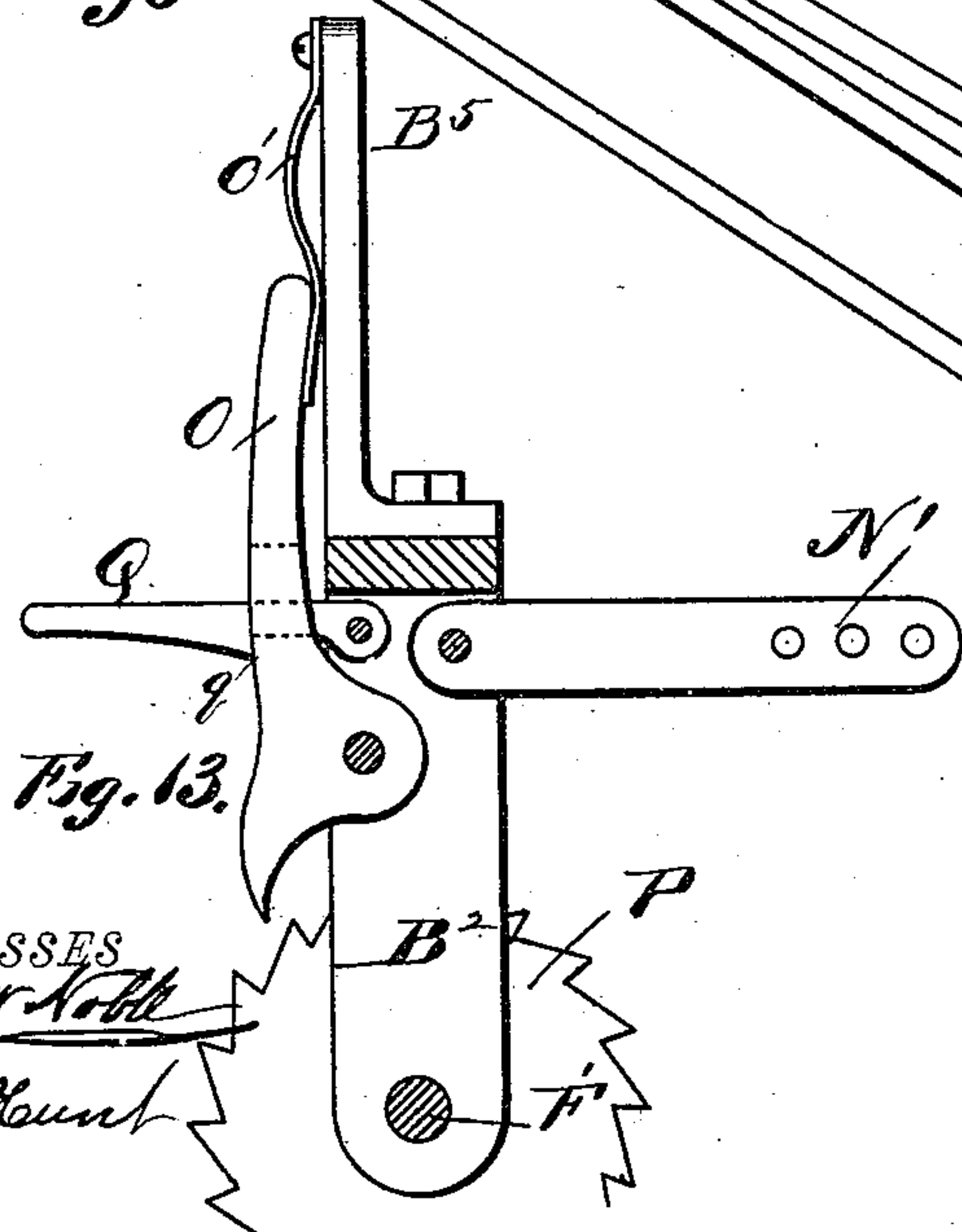
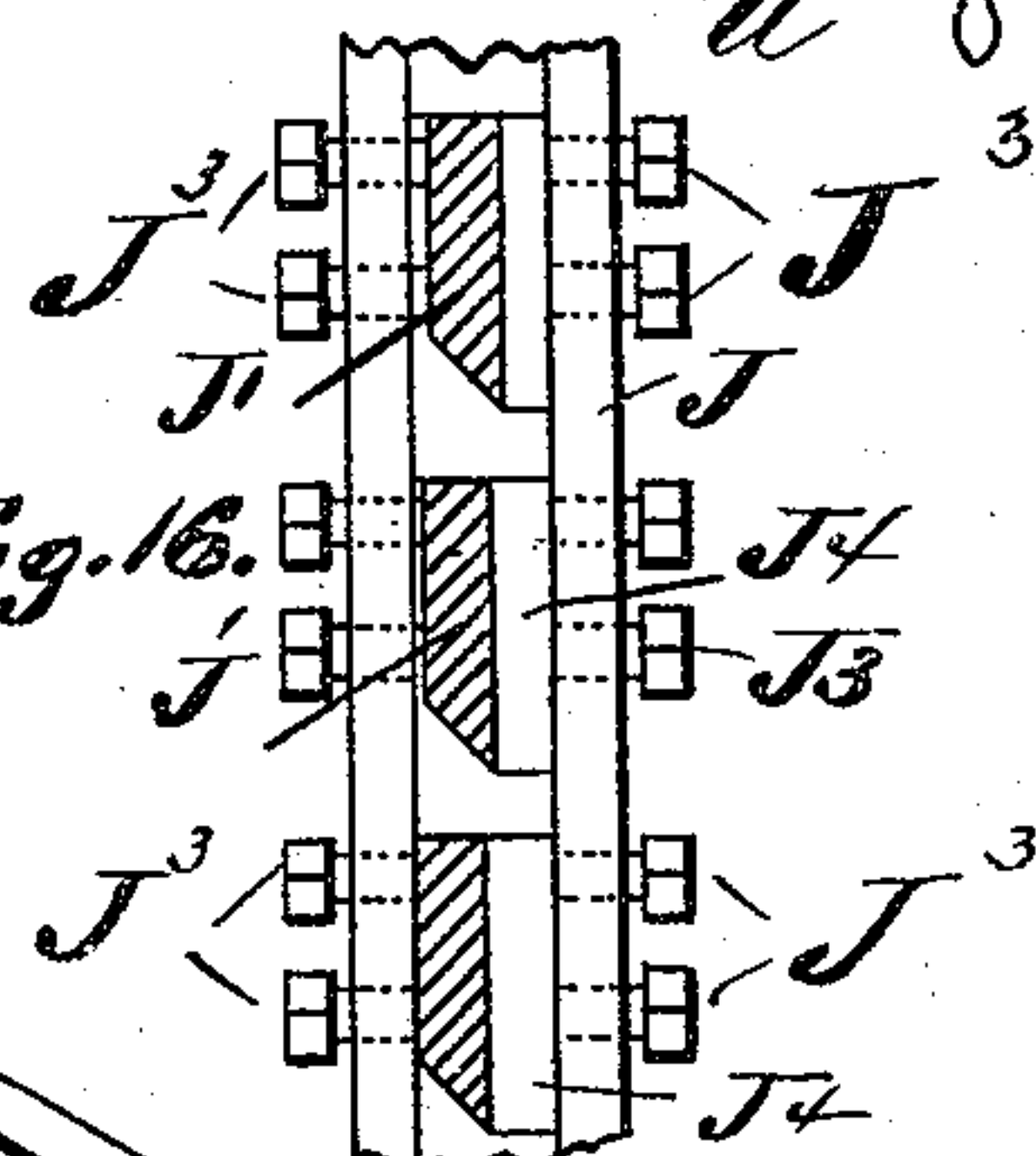
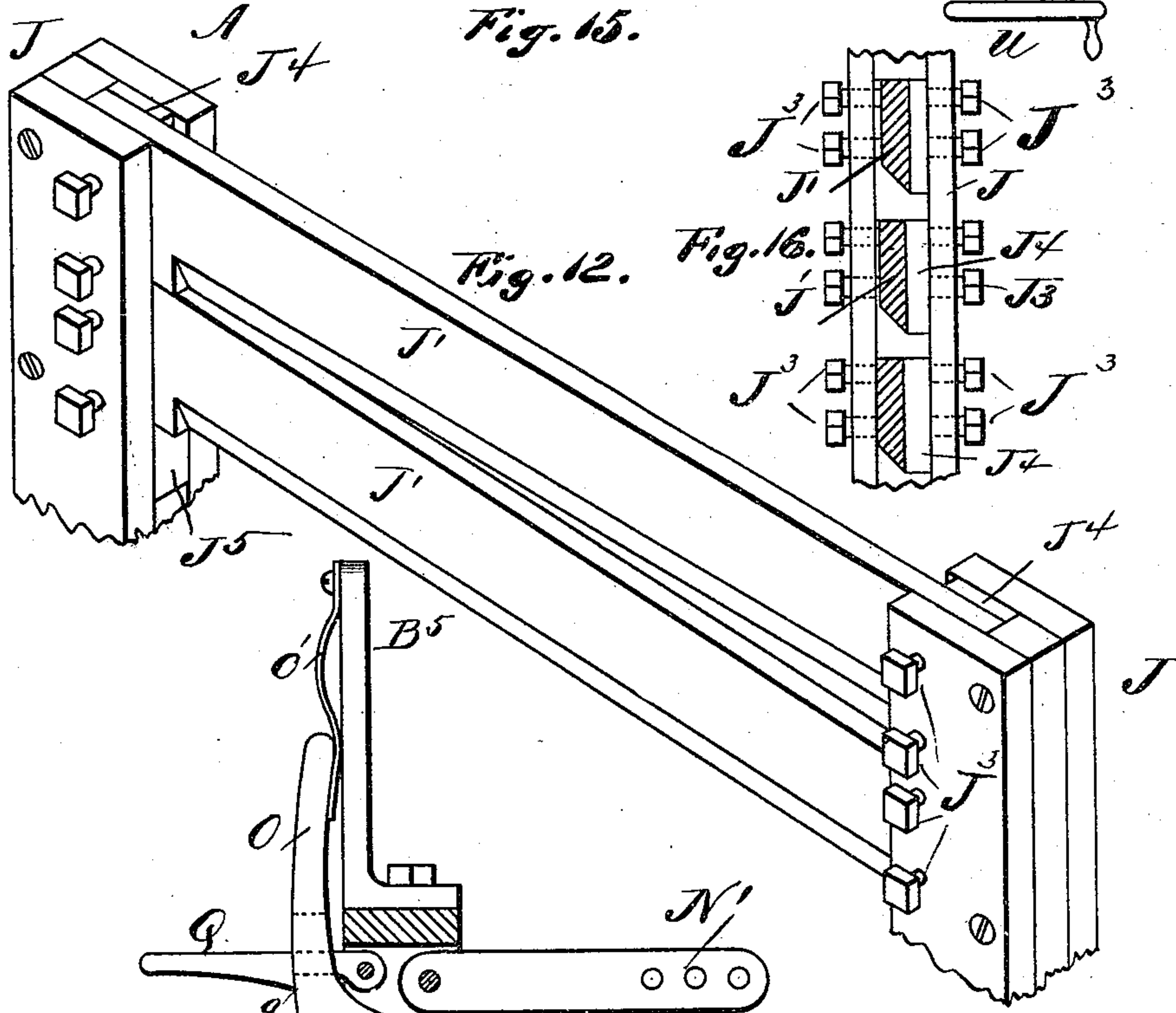
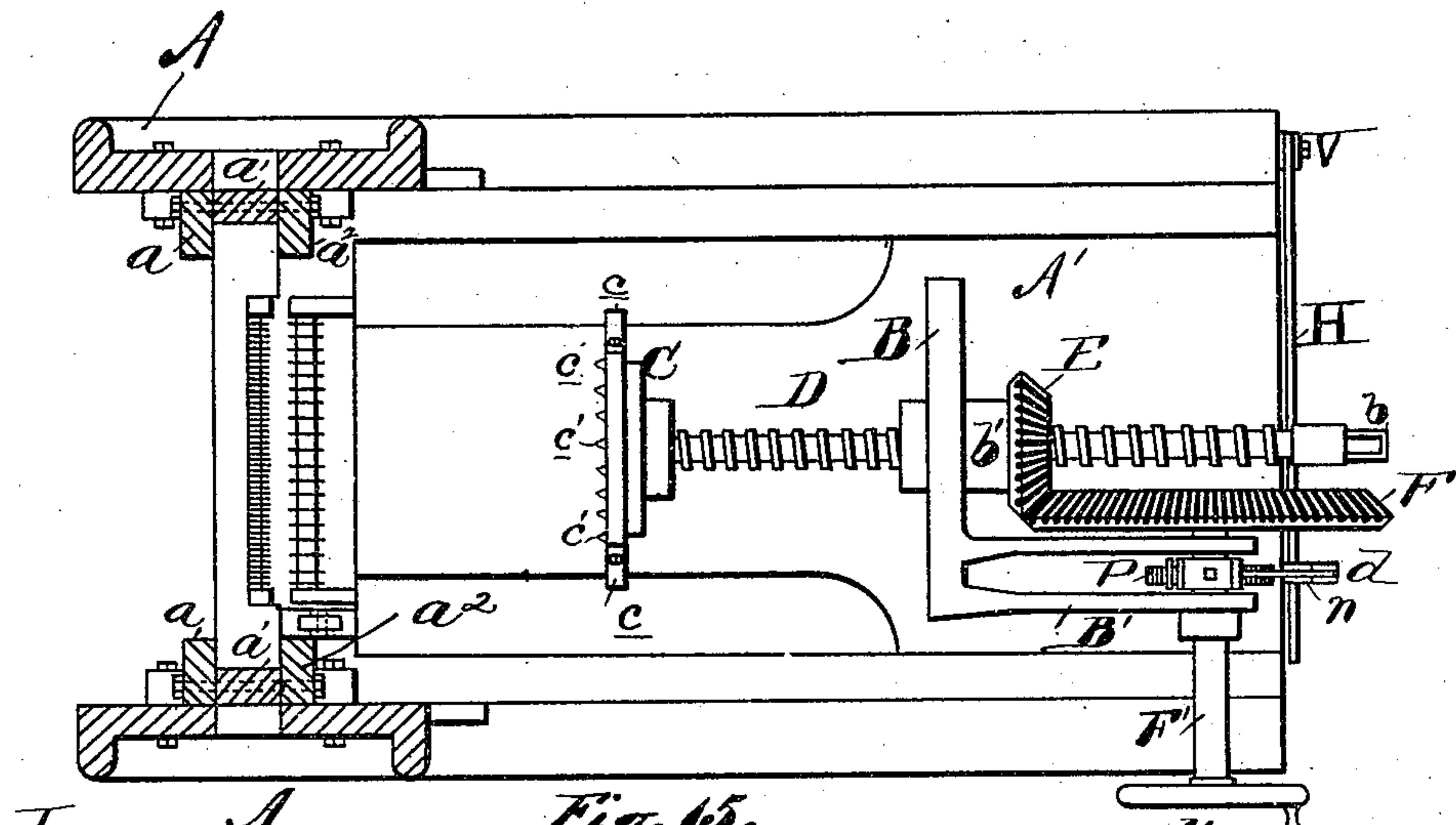
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EXCELSIOR-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 447,846, dated March 10, 1891.

Application filed June 23, 1890. Serial No. 356,428. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GILES SMITH, a citizen of the United States, of Detroit, in the county of Wayne and State of Michigan, have
5 invented new and useful Improvements in Excelsior-Cutting Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a
10 part of this specification.

My invention relates to an improvement in excelsior-cutting machines.

The objects of my invention are to provide
15 positive means for automatically feeding the block to be cut into excelsior to the knives, to provide the means for cleaning the roller-slitter from shavings or other waste, and means for more readily and accurately gaging the set of the cutting-knives with one another;
20 and it consists in the means of communicating motion from the reciprocating cutter-plate to the feed-plate carrying the block of wood to be cut into excelsior, and the devices for cleaning the spaces between the slitting-blades of the roller-slitter, and in the construction of the shaving-knife blades and the
25 gages by which the interval between the knives and the thickness of the excelsior is determined, and in the peculiar combination, construction, and arrangement of the several
30 parts, as hereinafter more particularly described and claimed.

Figure 1 is a side elevation showing one side of the entire machine. Fig. 2 is a side
35 elevation showing the opposite side of the machine, a portion being broken away to show the section of the feed mechanism. Fig. 3 is a front elevation showing the position of the knives. Fig. 4 is a rear elevation showing the
40 feed mechanism. Fig. 5 is a view of the roller-slitter cleaner, with a section of the roller-slitter. Fig. 6 is a vertical sectional view of the journal-box of the roller-slitter. Fig. 7 is the roller-slitter, partly in section, showing its construction. Fig. 8 is one of the washers of the
45 roller-slitter. Fig. 9 is one of the knives of the roller-slitter. Fig. 10 is a sectional view of the roller slitter and cleaner on the line x x in Fig. 5. Fig. 11 is a sectional view of the roller slitter and cleaner on the line y y in
50 Fig. 5. Fig. 12 is a perspective view of a part of the cutter. Fig. 13 is an enlarged

sectional view of the pawl and ratchet of the feed mechanism. Fig. 14 is a plan view of the roller-slitter journal-box. Fig. 15 is a
55 plan view of the table and the feed mechanism. Fig. 16 is a sectional view of the posts of the cutter-plate, showing the gage of the knife-blades. Fig. 17 is a perspective view of one end of a knife-blade.
60

In the drawings, A A are the standards of the main frame, fastened together by girths, rods, or bolts, or in any other suitable way.

A' is a table extending to the rear from the main frame, of a proper height, and supports
65 the feed mechanism and the block of wood to be cut into excelsior.

B is a standard arising from the table A' and supports the feed-plate and the mechanism actuating it.
70

b is a vertically longitudinally slotted arm extending from the standard B in a direction opposite to the forward motion of the feed-plate C.

b' is a stud or hub projecting from the standard B in the same direction as the arm
75 b . This hub is perforated through its center to allow the passage of the screw-threaded shaft D, which is provided with and guided at its outer end by the guide-pin d , which
80 runs in the slot in the arm b . This pin extends through the arm b and curves under the table A' and carries at its lower end a stud d' . The inner end of the screw-shaft D is connected by a suitable joint to the feed-
85 plate C.

c c are guide-plates, which are attached to the side edges of the feed-plate and extend below the edge of the table A' and are then inclined inward to engage with the edge of
90 the table, which is beveled downward for that purpose.

c' c' are spurs projecting from the front face of the feed-plate to engage with the
95 block of wood to be cut.

E is a beveled spur-wheel cored out at its center and interiorly screw-threaded for the reception of the screw-threaded shaft D, rotating on or against the hub b' .

B' is an arm projecting from the standard
100 B and bent to project rearwardly and slotted for the reception of the ratchet and pawl of the feed mechanism.

F' is a shaft supported by the arm B' at its

outer end in suitable journal-bearings. A spur-wheel F is keyed on the inner end of the shaft F' and meshes with the spur-wheel E. A crank-wheel *u* is properly keyed on the outer end of the shaft F' and is provided with a crank pin or handle for rotating it by hand.

J' is the cutter-plate carrying the splitter-roller and shaving-knives, which reciprocates in ways or guides *y y* on the main frame.

j is an inclined plane on the rear face of the cutter-plate which moves the bar backward.

X is the pitman by which the cutter-plate is reciprocated, and which is attached at its lower end to the crank-pin or any convenient rotating shaft.

h h' are slotted brackets or hangers on the under side of the table A'.

G is a bar which reciprocates longitudinally in the slots in the hangers *h h'*. This bar is slotted at its inner end for the reception of the friction-wheel I', which is pivoted in the slot and runs in contact with the inclined plane on the cutter-plate.

I is a coiled spring, attached at one end to the hanger *h* and at the other to the bracket *i'* on the bar G, and serves to draw the bar G back as the inclined plane drops down with the cutter-plate.

i is a set of friction-rollers on the hanger *h*, to facilitate the movement of the bar G.

g is a nut or stud on the bar G, with an outwardly-inclined plane on its upper side.

n is an arm extending from the table A' over the bar G and slotted at its outer end for the reception of the lever N.

N is a lever fulcrumed in the slot at the outer end of the arm *n* and pivoted to the outer end of the bar G at its lower end, and at its upper end to the link N'. This link is pivoted at its inner end to the arm B², which is journaled on the shaft F'.

P is a ratchet-wheel keyed on the shaft F'.

O is a pawl pivoted on the arm B² and engages with the ratchet-wheel P.

B⁵ is an arm attached to the upper end of the arm B², and carries the spring O', which throws the pawl O in engagement with the ratchet-wheel P.

Q is a lever pivoted to the arm B², provided with the latch or catch *q*, and passes through a slot in the pawl O. When it is desired to hold the pawl out of engagement with the ratchet-wheel to allow of the gigging back of the feed-plate, the upper arm of the pawl is pressed back and the lever Q brought down, and the latch *q* catches and holds the pawl away from the ratchet-wheel.

H is a bar pivoted to the rear frame of the table A at *v*, and extends across and a little beyond the table and rests on the stud or bracket *g* on the bar G. By dropping this lever or bar down between the stud *g* and the frame of the table the motion of the bar G will be arrested and the feed mechanism will remain at rest.

The operation of this part of my invention is as follows: As the cutter-plate carrying the inclined plane ascends after making a cut the inclined plane forces the bar G outward. The lower end of the lever N is thrown out and the upper end inward, impelling the link and arm B² forward. The pawl O on the arm B² is carried forward with it, and as it is in engagement with the ratchet-wheel on the shaft F', that is turned with the ratchet-wheel, the shaft F' turns the wheel F, and that turns the wheel E. The screw-shaft is moved inward, and the block of wood to be cut is thus fed up to the knives. When it is desired to gig back the feed-plate, the pawl O is held out of engagement with the ratchet-wheel by the latch Q and the shaft F' rotated by hand until the movement is completed. The remaining portion of the old block can then be removed and a new one put in and the machine started by releasing the pawl and the bar G by raising the latches Q and H.

Y Y are grooved guides or ways, in which the cutter-plate reciprocates, bolted on the inside of the standards A A of the main frame.

J J are the posts of the frame of the cutter, held together by girts at the top and bottom. These posts may be made of three bars *a a' a''*, the two outer bars *a* and *a''* being of greater width than the inner one *a'*, in order to form the groove for the reception of the knife-blades J' J' and the stud on the back of the splitter-roller journal-box. If preferred, the posts J J may be made of a single bar and the groove cut out.

J⁶ is a plate inserted in the groove in the frame of the cutter-plate below the shaving-knives and roller-splitter. The front side of the block to be cut should rest against this plate when the cutter-plate begins its downward stroke. The front face of the plate should be the one-tenth of an inch or the full depth of the feed for the cut back of the edge of the groove in which it is inserted, so that the edge of the shaving-knife next above it should project over it the one-hundredth part of an inch.

J' J' J' are the shaving-knives, all of the same thickness, inserted in the cutter-frame in the grooves in the sides of the posts.

J⁴ are plates inserted between the ends of the knife-blades and the sides of the grooves in the posts of the cutter-frame, and are perforated for the passage of the set-screw by which they are held in place. Each plate is the one-hundredth part of an inch thicker than the one next below it—that is, the difference in the thickness of these plates should be just the thickness of the excelsior when cut. These plates are inserted at the front and back of the knife-blades and gaged according to the required set of the knife-blades, so as to cause each blade to project the thickness of the plate beyond the blade next below, and so on through the series. The set-

screws J^3 secure the knife-blades J' and gage-plates in the grooves in the posts.

J^5 is a block placed in the grooves under the opposite ends of each alternate knife-blade to give the cutting-edge an angle, which not only enables the knife to cut more easily, but also curls the excelsior, which is a desirable feature. The blocks J^5 J^5 are beveled from the rear or inside to the front or outside, as the pitch of the knives may require.

X' is a loop or bracket attached to the lower end of the cutter-plate, to which a pitman is attached, which is connected to the wrist-pin of any convenient crank-shaft driven by power.

R is the roller-slitter.

R' is the square shaft of the roller-slitter with journals at its ends to rotate in the journal-box T . The shaft R carries the slitting-blades r and the washers r' , placed alternately on the bar and secured by the nuts at the ends.

T is a journal-box provided with a stud or rib T^4 on its outer side to slide in the grooves in the posts of the cutter-frame.

T' is a recess cut in the front edge of the journal-box T , beveled outward both upward and downward, the inner end being circular to form a part of the journal-bearing of the journal of the roller-slitter. This recess is closed by the truncated triangular cap or piece t , which is circularly recessed at its inner end to complete the journal-bearing of the roller-slitter. The cap t is held in place by the bolt t' , which passes through the journal-box T and the cap, and is secured by the nut t^2 on its lower end. A rectangular slot S^4 is cut in the journal-box T at its inner upper corner, having an inclination of about forty-five degrees with the edges of the journal-box. The cap S^3 , held in position by proper screws, closes this slot at its outer ends.

S' is a square bar having its ends cut away to form a rectangular tenon to fit in the rectangular slot S^4 in the journal-box T . A screw-thread is cut on each end of the bar above the shoulder of the tenon.

S S are flat pieces of steel plate rectangular on two sides and on one end. The other end is circularly recessed, the radius of the circle being a little more than the radius of the washer r' on the roller-slitter. The thickness of these plates should be a little less than that of the washer r' .

S^2 are rectangular plates or washers of smaller size than the plates S and thicker than the cutting-blades of the roller-slitter. The plates S and S^2 are all perforated by a square perforation to fit on the bar S' , and are placed alternately on the bar and held in position by the screw-nut on each end of the bar. The plates must be so arranged that the circularly-recessed end of the plate S may be inserted between the cutting-blades r r of the roller-slitter and over the washer r' , when the ends of the bar S' are inserted in the slot S^4 in the journal-box T . The plates S re-

move all shavings and waste from the space between the cutter-blades of the slitter-roller, thus allowing them to cut the full depth of the feed. The bar S' is held in position by the cap S^3 .

What I claim as my invention is—

1. In an excelsior-cutting machine, the combination of the main frame in which the cutter-plate reciprocates with the table which supports the feed mechanism, the cutter-plate carrying the inclined plane, the inclined plane which pushes out the bar extended beneath the table, the spring to retract the bar, the stud on the bar which supports the locking-latch, and the locking-latch pivoted to the table, all substantially as described.

2. In an excelsior-machine, the combination of the main frame A A , in which the cutter-plate reciprocates with the table A' , which supports the feed mechanism, the cutter-plate J , which carries the inclined plane j , the inclined plane j , which pushes the bar G outward, the bar G , suspended in hangers beneath the table A' , the spring I for retracting the bar G , the lever N , fulcrumed on the arm n and pivoted at its lower end to the bar G , and connected at its upper end by the link N' to the feed mechanism, all substantially as described.

3. In an excelsior-cutting machine, the combination of the main frame A A , in which the cutter-plate reciprocates, with the table A' , which supports the feed mechanism, the cutter-plate J , which carries the inclined plane j , the inclined plane j , which impels the bar G outward, the bar G , reciprocating in the hangers under the table A , the spring I for retracting the bar G , the lever N , vibrated by the bar G and fulcrumed on the arm n of the table A , the link N' , connecting the lever N to the arm B , the arm B , journaled on the shaft F' and carrying the pawl O , the pawl O , which engages with the ratchet-wheel P , and the ratchet P , which rotates the shaft F' of the feed mechanism, all substantially as described.

4. In an excelsior-cutting machine, the combination of the main frame A with the table A' , supporting the feed mechanism, the standard B , arising from the table A' , the screw-shaft D , supported in the spur-wheel E by the standard B , the feed-plate C , actuated by the screw-shaft D , the spur-wheel E , screw-threaded interiorly to engage with the screw-shaft D , the spur-wheel F on the shaft F' and meshing with the spur-wheel E , the shaft F , journaled on an arm of the standard B , the ratchet-wheel P , keyed on the shaft F , the pawl O , pivoted to the arm B^2 and engaging with the ratchet-wheel P , the arm B^2 , journaled on the shaft F' , the link N' , connecting the arm B^2 to the lever N , the lever N , pivoted to and vibrating on the arm n and connected at its lower end to the bar G , the bar G , reciprocating in hangers under the table A' and actuated by the inclined plane j ,

the inclined plane *j* on the cutter-plate, and the cutter-plate reciprocating in the main frame A, all substantially as described.

5 5. In an excelsior-cutting machine, the combination of the posts of the cutter-plate provided with grooves for the reception of the knife-blades, with the knife-blades and the gage-plates for gaging the cut of the knives, all substantially as described.

10 6. In an excelsior-cutting machine, the combination of the journal-box of the roller-slitter with the roller-slitter journaled in the journal-box, and the roller-slitter cleaner attached to the journal-box of the roller-slitter, 15 all substantially as described.

7. In an excelsior-cutting machine, the combination of the roller-slitter for slitting the block and the roller-slitter cleaner for freeing the roller-slitter from shavings, all substantially as described. 20

8. In an excelsior-cutting machine, the combination of the posts of the cutter-plate, provided with grooves for the reception of the knife-blade, with the knife-blades for cutting

the excelsior, the roller-slitter for slitting the 25 block, and the roller-slitter cleaner, all substantially as described.

9. In an excelsior cutting machine, the combination of the table which supports the feed mechanism with the standard B, arising from 30 the table, the screw-shaft D, supported in the spur-wheel E on the standard B, the feed-plate C, actuated by the screw-shaft D, the spur-wheel E, interiorly screw-threaded to engage with the shaft D, the spur-wheel F 35 on the shaft F' and meshing with the spur-wheel E, the shaft F', journaled on an arm of the standard B, the ratchet-wheel P, keyed on the shaft F, the pawl O, pivoted to the arm B and engaging with the ratchet-wheel 40 P, the link connecting the arm B to the lever N, and the lever N, pivoted to and vibrating on the arm *n*, all substantially as described.

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Witnesses:

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