

(No Model.)

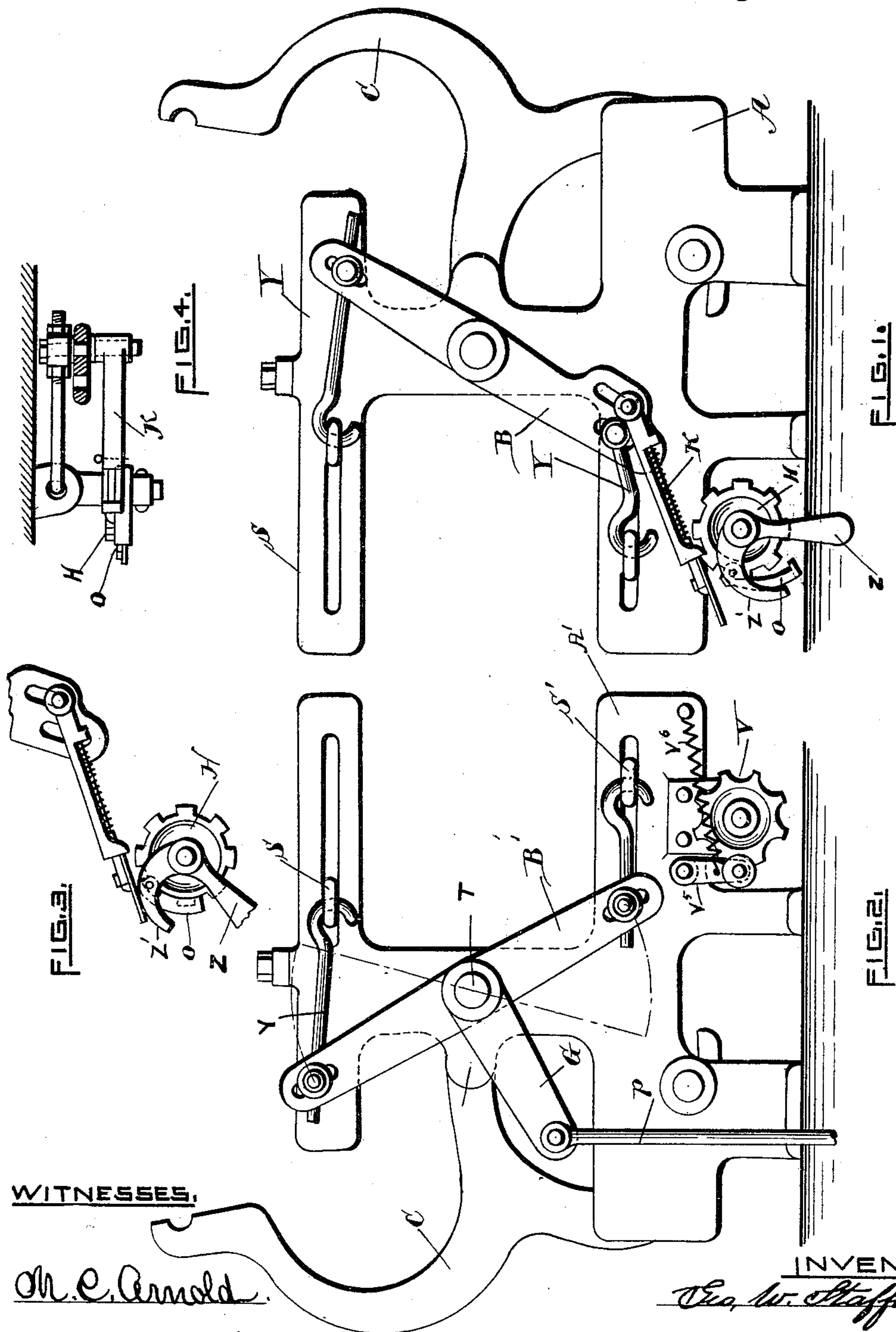
5 Sheets—Sheet 1.

G. W. STAFFORD & S. D. BARRETT.

SHEDDING MECHANISM FOR LOOMS.

No. 388,318.

Patented Aug. 21, 1888.



WITNESSES.

Mr. C. Arnold.

James E. Arnold.

INVENTORS

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By Benj. Arnold, Atty.

(No Model.)

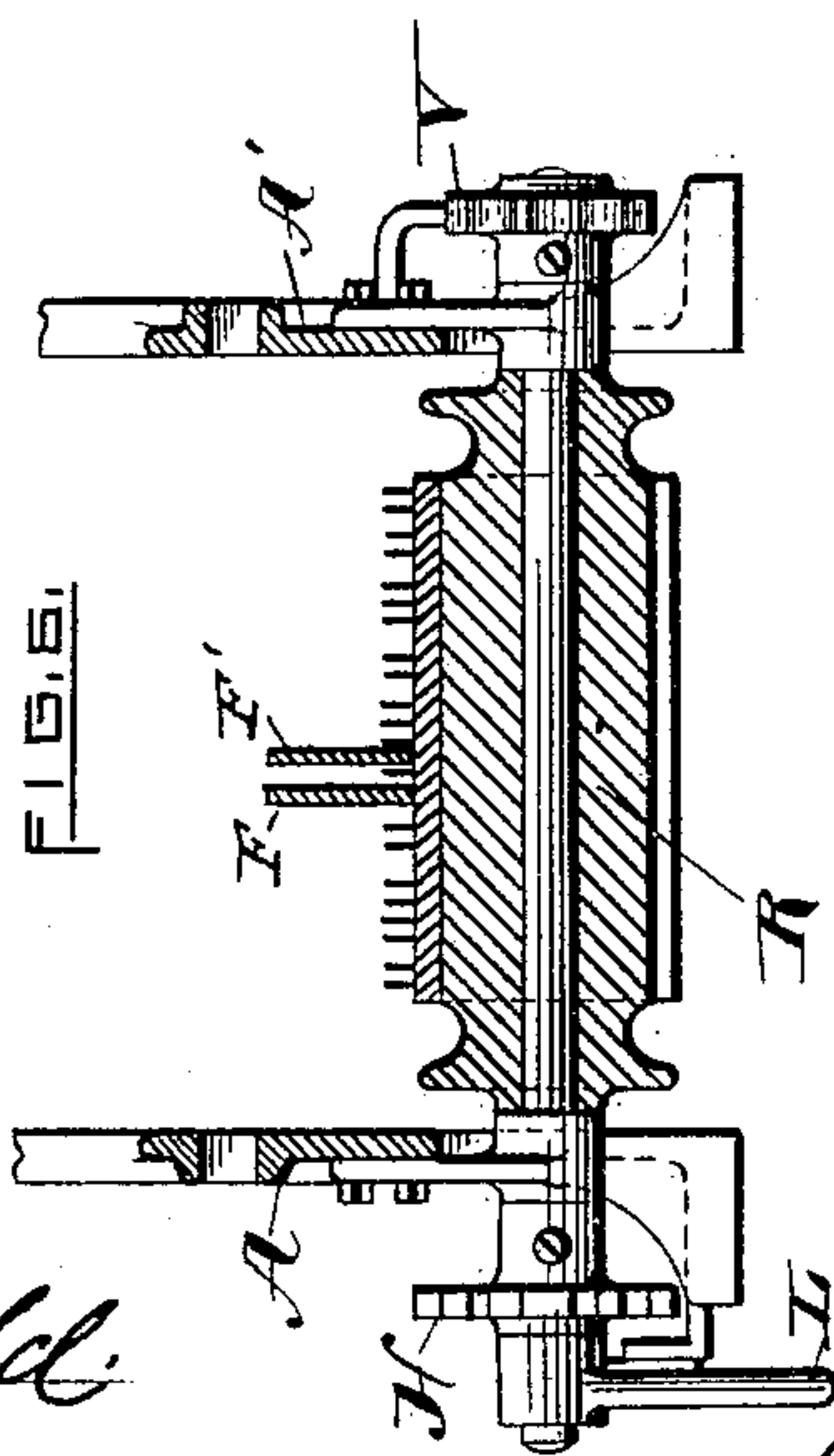
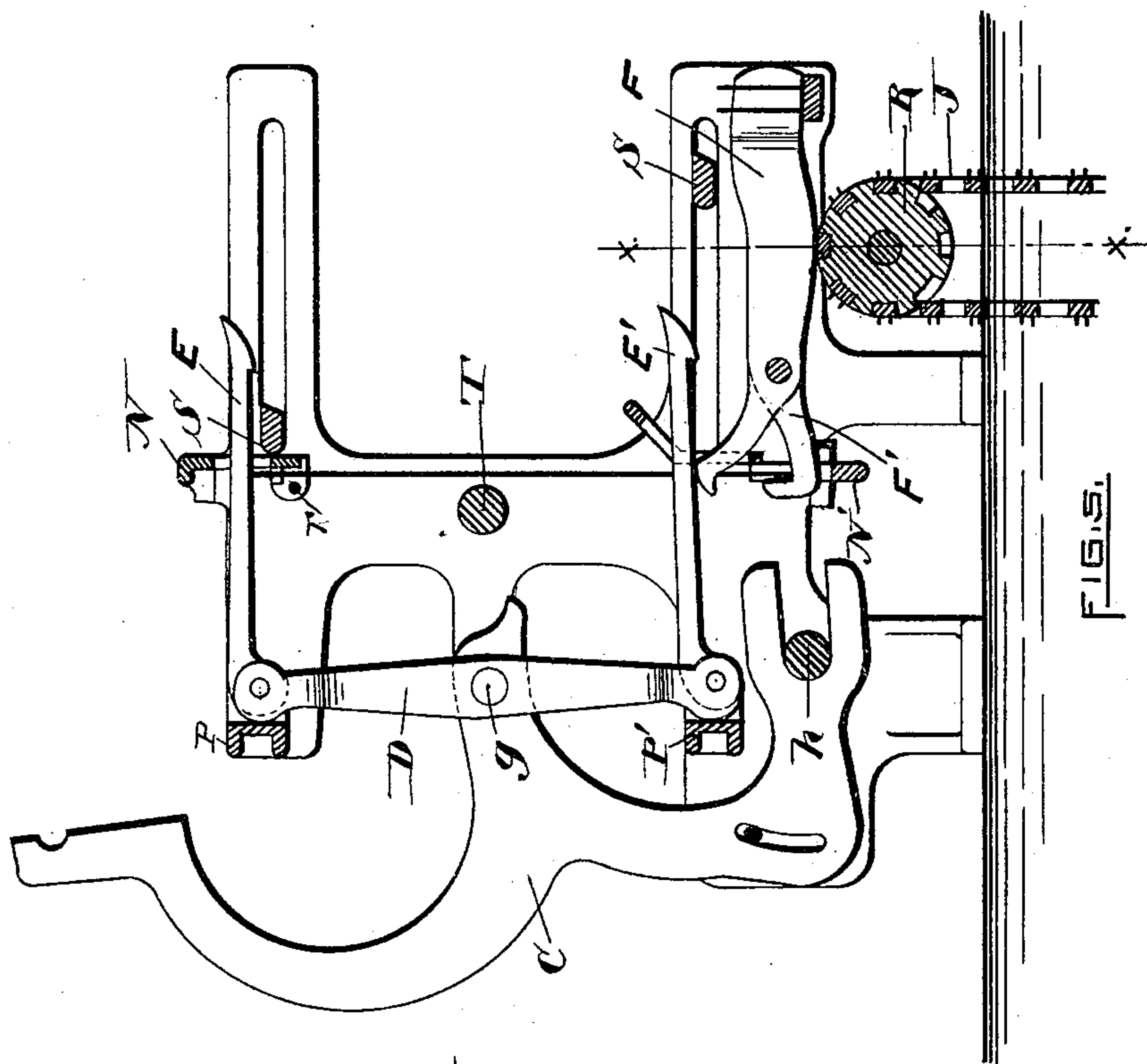
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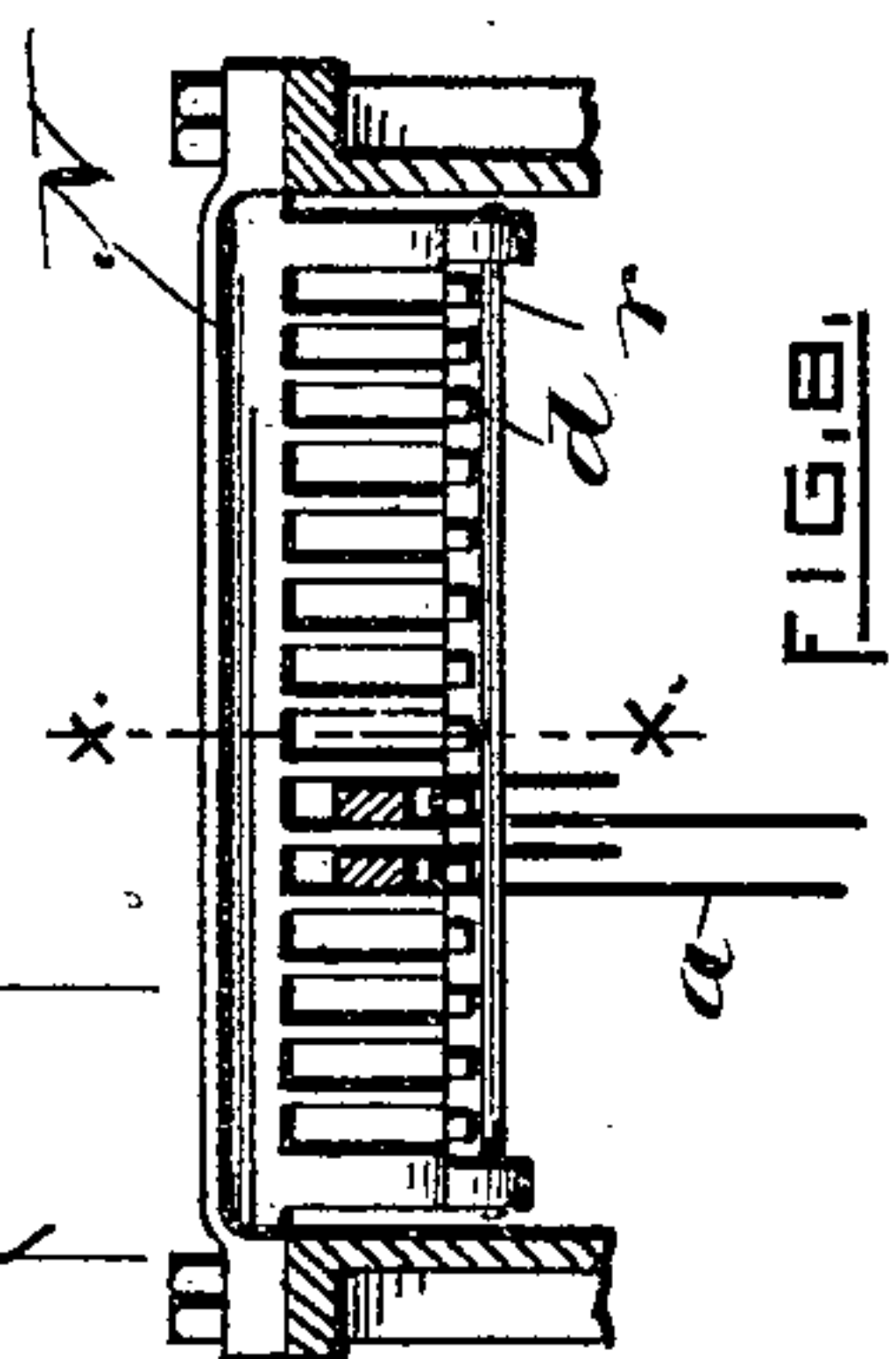
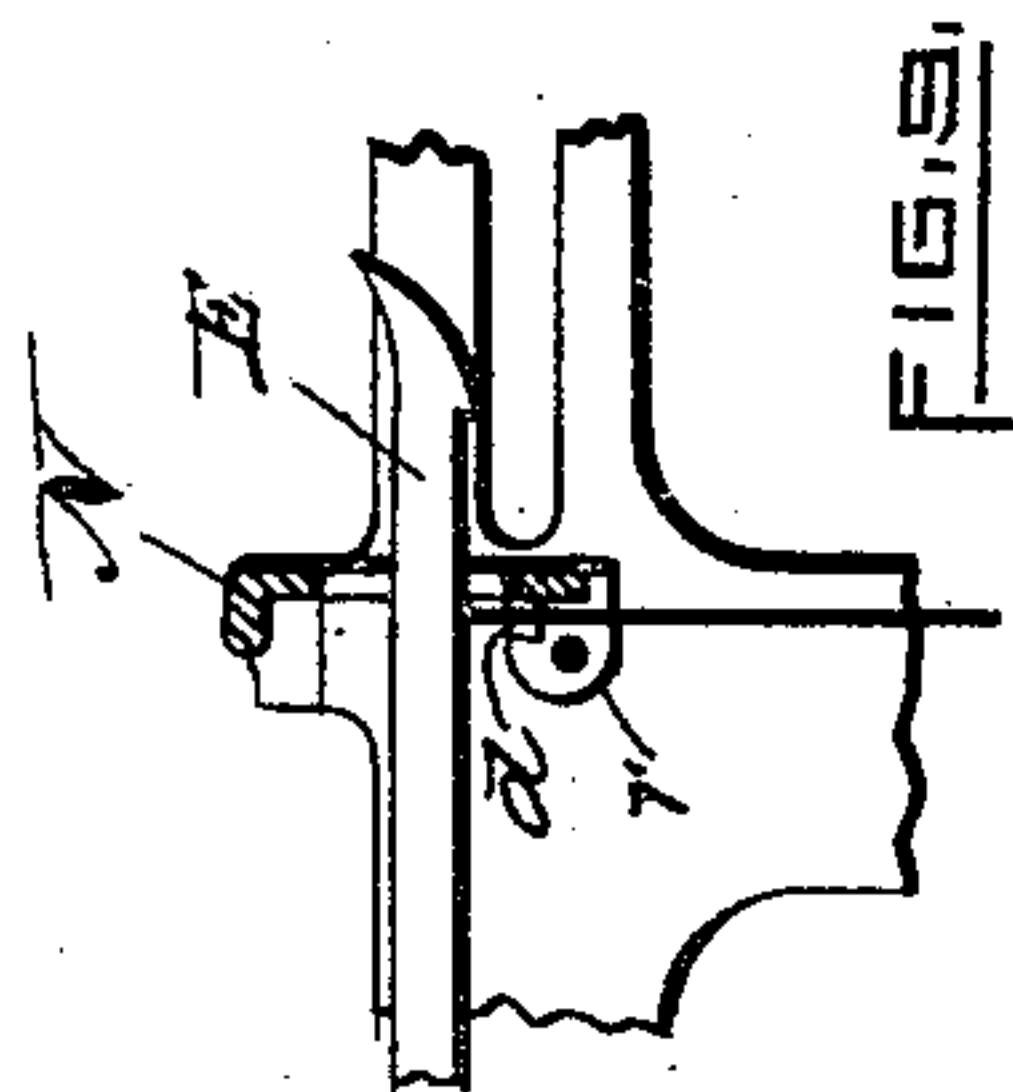
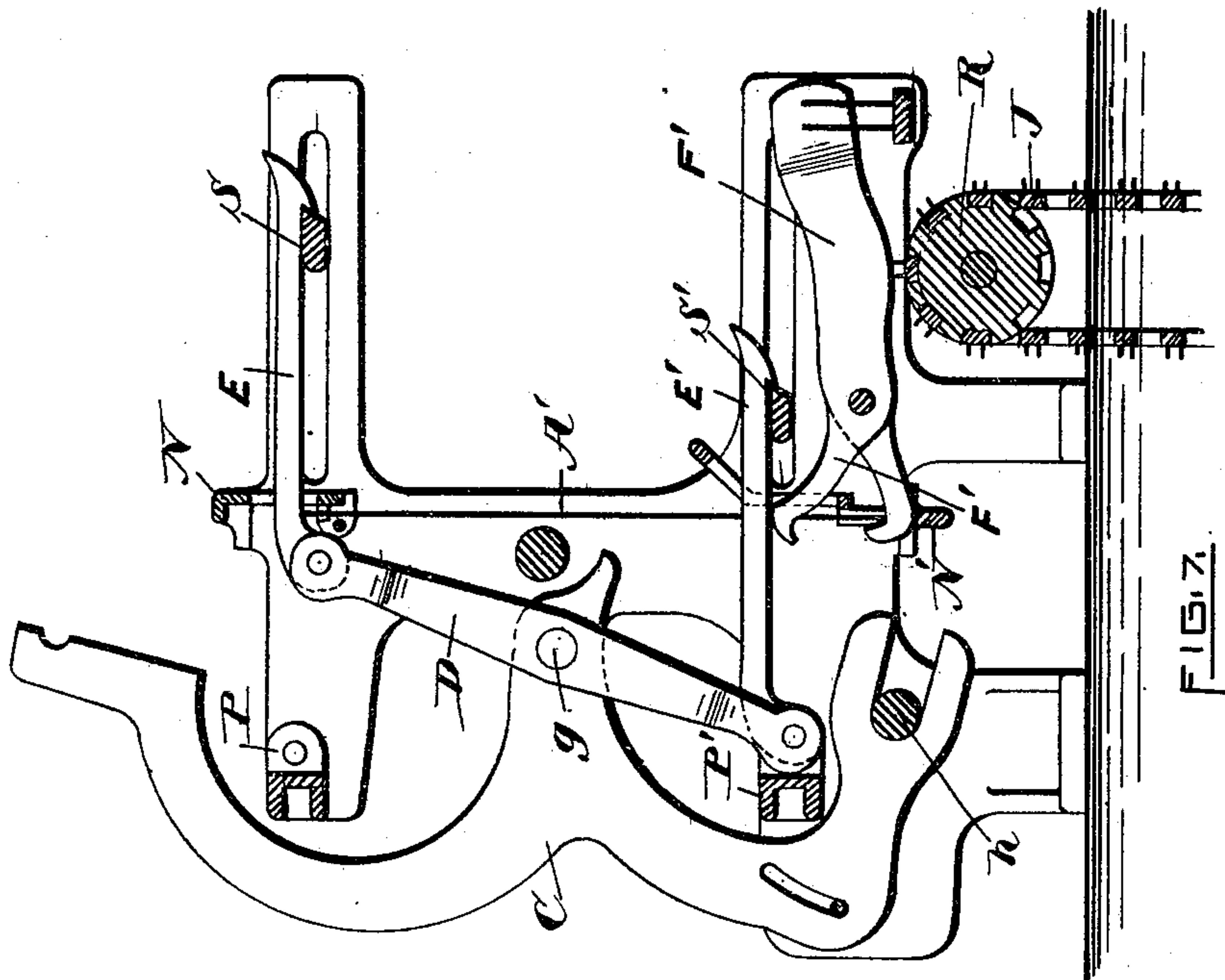
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WITNESSES.

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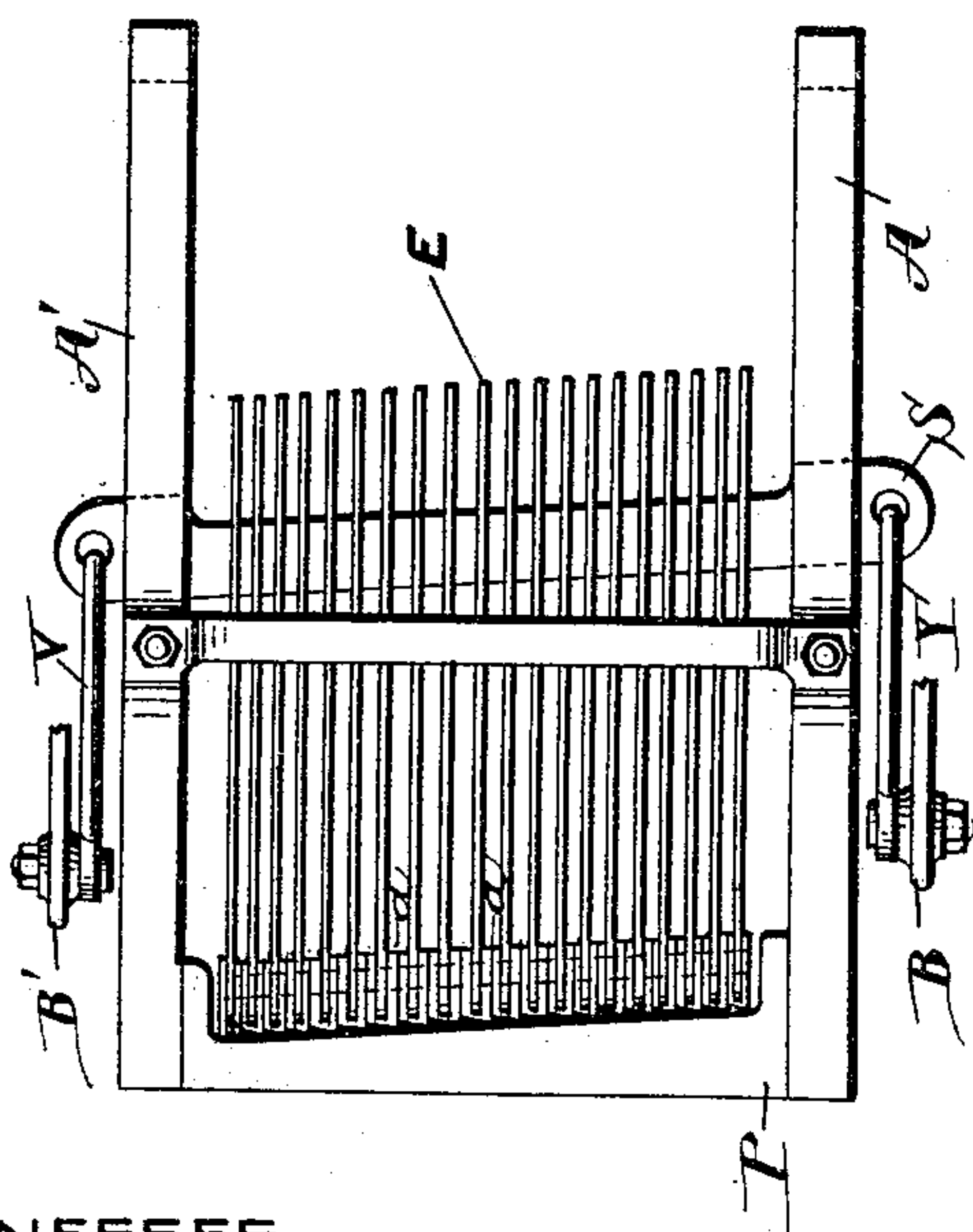
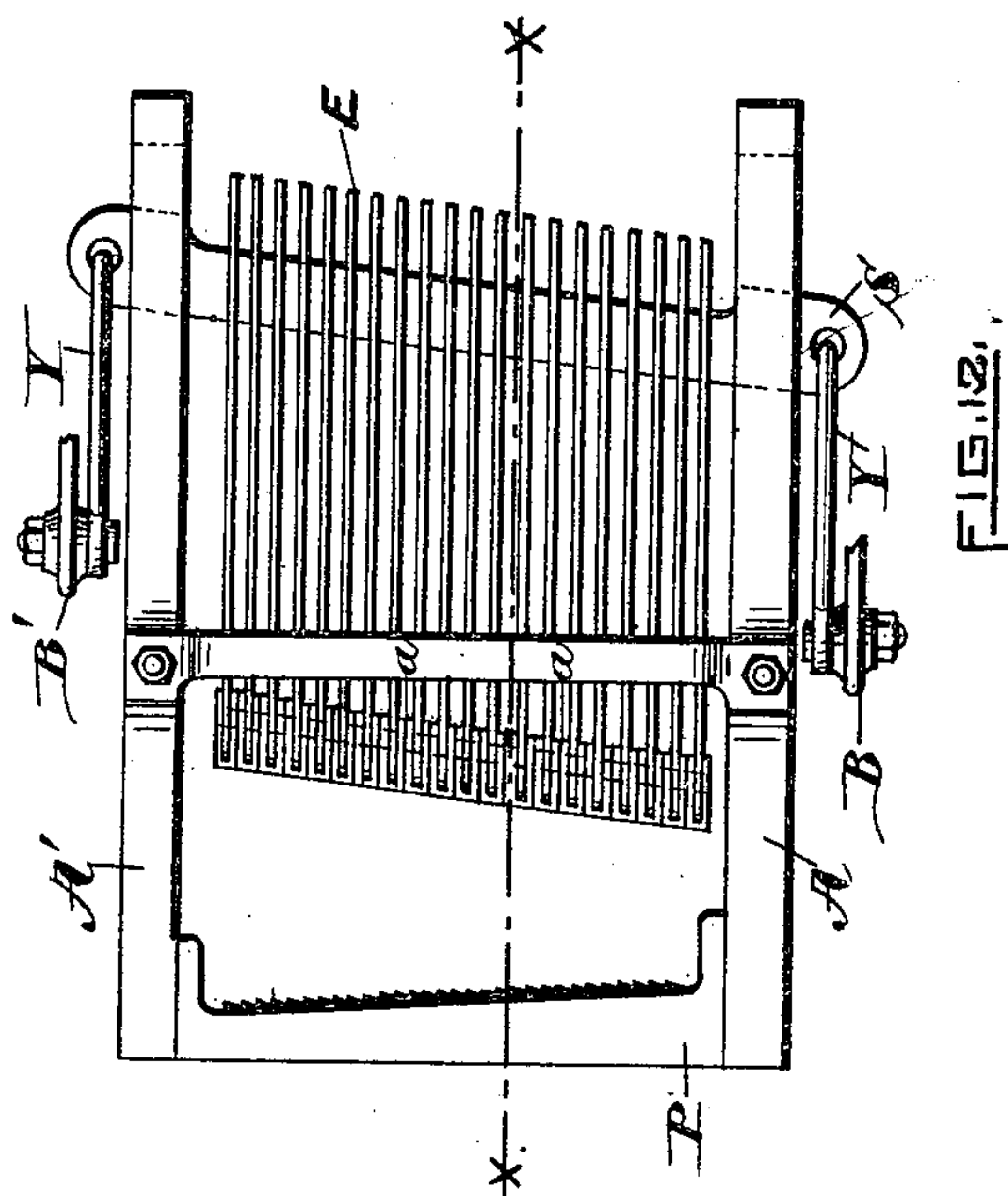
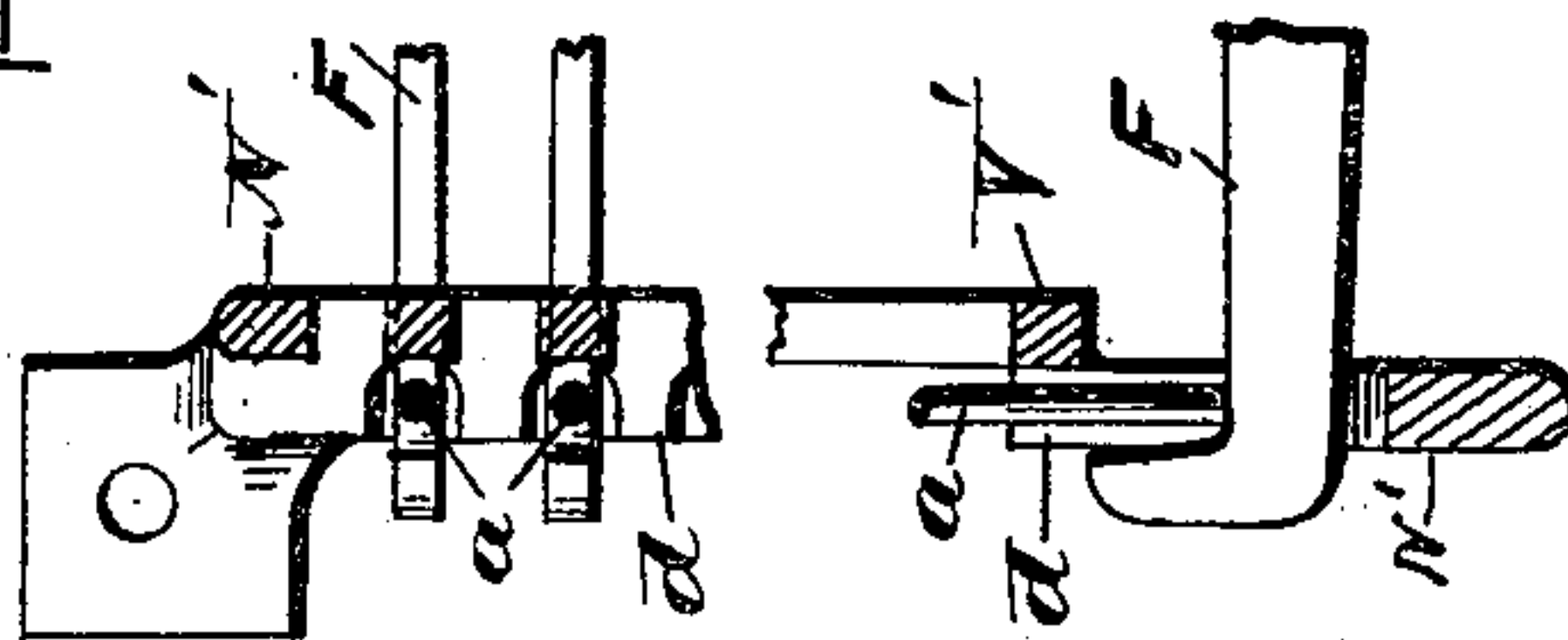


FIG. 11.

FIG. 14.

FIG. 13.



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Fig. 15.

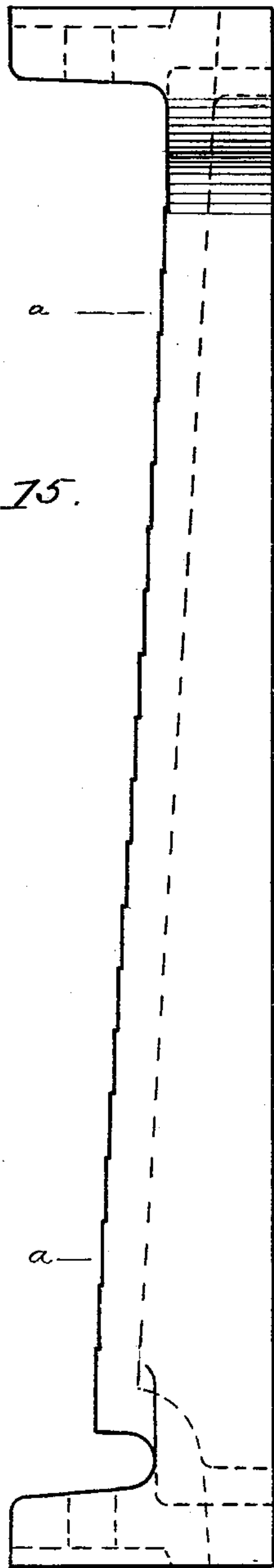
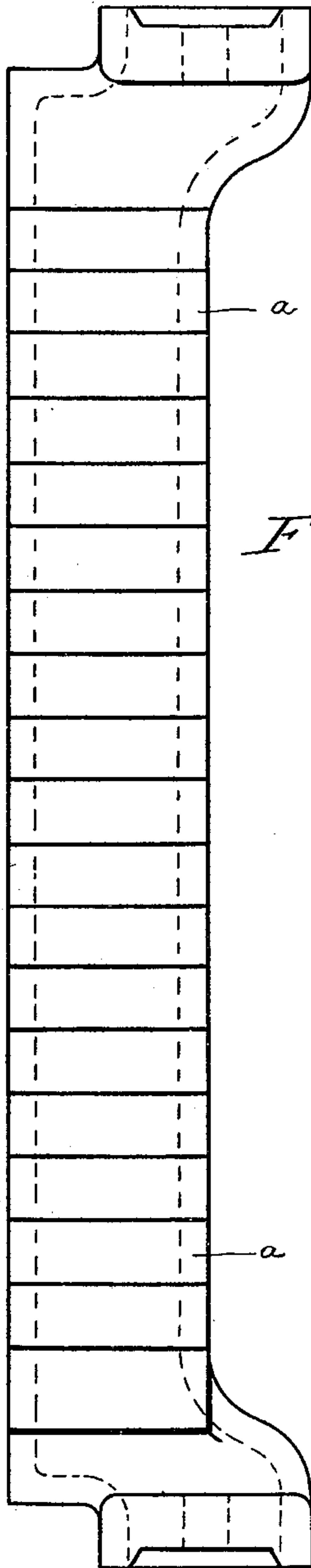


Fig. 16.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE W. STAFFORD AND SAMUEL D. BARRETT, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS TO THE GEORGE W. STAFFORD MANUFACTURING COMPANY, OF SAME PLACE.

SHEDDING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 388,318, dated August 21, 1888.

Application filed October 11, 1887. Serial No. 252,057. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. STAFFORD and SAMUEL D. BARRETT, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Shedding Mechanism for Looms; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Our invention relates to the mechanism called a "dobby," used for operating the heddle-frames or harnesses in looms, and is an improvement upon that form of dobbie shown, for example, in United States Patent No. 217,589.

It is illustrated in the accompanying drawings.

Figure 1 is a front elevation of the dobbie. Fig. 2 is a back elevation of the same. Fig. 3 is a broken elevation of the devices for "picking back." Fig. 4 is a top view of the parts shown in Fig. 3. Fig. 5 shows a vertical section, mostly in elevation, taken through line xx in Fig. 12. Fig. 6 is a sectional view of the pattern-cylinder and its supports. Fig. 7 is a sectional view taken the same as Fig. 5, but with the parts in a different position. Fig. 8 shows the top rack-bar for holding the upper latches and the wires for lifting them. Fig. 9 is a section of the same on line xx in Fig. 8. Fig. 10 is an enlarged view of the upper end of a lifter-wire and its support. Fig. 11 shows a top view of the dobbie with the operating-lever left out. Fig. 12 is the same as Fig. 11 with the moving parts in a different position. Fig. 13 is a sectional elevation showing the lower part of a lifting-wire and the end of a plate-lever. Fig. 14 shows a top view of the parts shown in Fig. 13. Fig. 15 shows an enlarged top view of one of the bars P. Fig. 16 shows a side view, enlarged, of the same.

Our improvements are intended, first, to obtain a more perfect elevation of the heddle-frames in looms using many of them, in which some of these frames, being necessarily farther

from the front of the loom than the others, 50 require to be raised higher to produce the same angle for the warp-threads in them than those nearer to the front do. This result has been attempted in the way shown in the United States Patent No. 217,589, hereinbefore mentioned, (see Figs. 1 and 8 of the drawings thereof,) in which a long lever, x^t , is used to 55 raise the heddle-frames, those frames requiring to be raised the highest having their cords attached to the notches farthest from the 60 pivot of the lever, so as to receive more motion; but this plan is objectionable and uncertain because of the liability of the shifting of the cords in the lever-notches from various causes, and for the serious objection that the 65 cords are worked at varying angles, which produces an uneven lift of the heddle-frames. A means of obviating these objections is to use shorter levers and to attach all the cords from the heddle-frames to them at the same distance 70 from the pivots of the levers, and give these levers a relative increase of motion according to the distance they are placed from the front by means of the lifter-bars that move them.

Figs. 1, 2, and 3 show how this is done. In Fig. 2 it will be seen that the rods Y that connect the back ends of the lifter-bars S S' to the lever B' are pivoted to that lever at a greater distance from its pivotal shaft T than 80 the rods Y in Fig. 1, that move the front ends of the same bars, S. Consequently the back ends of the bars S have more motion than the front ends, which gives the bars S the position shown in Fig. 12 when forward and in Fig. 85 11 when carried back. From this it will be seen that the operating-levers C, moved by the bars S S', have a regular increase of motion as they are placed farther from the front, and of course convey the same relative amount of 90 motion to the heddle-frames. This does away with the long levers and produces a compact equably-operating mechanism with all its cords on a level and conducted to the sheaves at the same angle.

The difference required between the two ends of the lifter-bars S S' can be adjusted by moving the pivots of the rods Y in the levers 95

B toward or from the pivotal shaft T. With the lifters thus operated, in order to avoid any lost motion by the latches we make the stop-bars P P' with their inner surfaces, against which the jack-levers D bear, parallel with the lifters S S' when the lifters are back in position to engage with the hook-latches E E' for the purpose of bringing the hook of each latch the same distance from the engaging side of the lifters S S'. The inclined faces of the stop-bars P P' are preferably made with a series of steps or surfaces, *a a*, parallel to the shaft T or back of the bars, as shown in Fig. 15, which serves to prevent the sliding and crowding of the jack-levers against each other when pressure is brought upon them in lifting the heddle-frames.

An arrangement is shown in Figs 1 and 3 for turning back the pattern-cylinder or "picking back," as it is called, when one or more picks of the shuttle have been made without any filling, which would make a break in the pattern. It consists of a hub with a handle, Z, hung loosely on the shaft of the pattern-cylinder outside of the ratchet-wheel H. The hub has a curved finger, Z', on one side, to which a hooked pawl, O, is pivoted and so placed as to be under the bar K, that moves the ratchet-wheel H. When it is necessary to pick back, the handle Z is turned up to the left until the curved finger Z' comes against the bar K and raises it out of the wheel H. At the same time that bar presses the pawl O down, causing the hooked end to catch in teeth of the ratchet-wheel and turn it back one notch or one pick, and by repeating the motion of the handle any number of picks back may be made. In this way less time is required, and it is more accurate than the way usually employed, which is to raise the bar K with one hand and turn the ratchet-wheel back with the other hand, in doing which the operative is liable to turn more or less than is needed; but with this device one motion of the handle made with one hand counts for one pick back, neither more or less.

A further improvement consists in the mode of making the lifting-wire and confining its lower end to the top of the plate-lever F.

The lifting-wire *a* consists of a straight wire bent into an open loop at the upper end. (See Fig. 10.) This loop hooks over a projection, *d*, cast on the rack N under the openings that guide the latches. This projection *d*, Fig. 8, guides the wire and keeps the top of the loop under the latch E, and a wire, *r*, is placed across outside of the wires *a* to keep them on the projections.

The general mechanism of the dobby is very much like that described in the patent above referred to, but differs in those parts comprising the improvements described above.

The moving mechanism is supported on shafts between the frames A A', which are connected by cross-bars. A series of curved levers, C, that operate the heddle-frames, are

held on the rod *h*, each of these levers C having a jack-lever, D, pivoted to it at *g*, and to the ends of the jack-levers are hung hooked latches E E'. (See Fig. 5.) An upper lifting-bar, S, and a lower one, S', slide in slots in the frames A A'. The rocking shaft T has levers B B'—one on each end of it outside of the frames—and these levers are connected to the ends of the lifters S S' by the rods Y, which move the lifters in their slots in the side frames. A pattern-cylinder, R, is made fast on a shaft having bearings in the frames, and the same shaft has a ratchet-wheel, H, fast on its front end, and a check-wheel, V, on its back end engaged by a pivoted check, V⁵, held in contact with said wheel by a spring, V⁶. A series of plate-levers, F F', are placed over the pattern-cylinder R on a rod, and are held in place in racks N'.

In dobbies as heretofore constructed there has been, as shown in the patent above referred to, only as many plate-levers used as jack-levers, both the upper and lower latches being raised at once by one plate-lever; but in our plan we employ twice as many plate-levers—two for each jack-lever or one for each latch—and so avoid working an upper latch when only a lower one is required, and vice versa. This plan requires a pattern-chain with twice as many rows of pins laterally, but only half as many bars of pins, and saves the extra working of the latches.

Operation: A rocking motion is given to the shaft T by the arm G, and the levers B B' will move the lifters S S' back and forth in the slots. The pawl-bar K, pivoted to lever B, will push the ratchet-wheel H over one notch at each vibration of the lever B. This moves the chain J, containing the pins, one bar each time, and when a pin comes under a plate-lever F or F' it raises its outer end and depresses its inner end, letting down the latch resting on it if it is a lower latch, and letting down a latch on a wire, *a*, if it is an upper latch. (See Fig. 5.) This allows the lifter S or S' to catch the dropped latch-hook and draw it over to the right, Fig. 5, and the other end of the jack-lever carrying that latch, being held by stop-bar P or P', will cause its pivot *g* to draw the lever C, holding it, over and lift the heddle-frame attached to it by a cord fast to its upper end. When by a return motion of the lever B the engaged latch is left free, the heddle-frame is drawn down again by a spring attached to its bottom bar in the usual way.

We are aware that it is not broadly new to impart an angular movement to the bars employed for lifting or depressing the heddle-frames of looms in effecting the shedding of the warp. We are also aware that levers of different lengths for operating the lifters and depressers of shedding mechanisms of looms substantially similar to the levers B B' have been employed heretofore; but we are not aware that the means herein shown for actuating the bars S S' with an angular movement

has ever been combined with the latches, jack-levers, levers C, &c., or that inclined stop-bars such as herein shown have ever been used.

5 Having thus described our improved shedding mechanism for looms, what we claim as our invention is—

10 1. The lifting-wire *a*, having an open loop on its upper end and its lower end plain, in combination with plate-lever F, racks N N', having projections *d*, and cross-wire *r*, substantially as and for the purpose set forth.

15 2. The combination of the pattern-cylinder R, ratchet-wheel H, pawl-bar K, handle Z, having the curved finger, and the pawl O, with mechanism to operate pawl-bar K, substantially as described, and for the purpose specified.

20 3. The combination, with the levers C, jack-levers D, latches E E', lifters S S', and means for actuating said lifters, of the stop-bars P P', having their inner surfaces inclined, as de-

scribed, substantially as and for the purpose specified.

4. The combination of the levers C, jack-levers D, latches E E', and lifters S S', with a 25 pivotal shaft, T, levers B B', links Y, connecting the opposite ends of the lifters to the said levers B B', the link Y intermediate the rear end of the lifter S and the upper end of the rear lever, B', being connected with the said 30 lever B' at a greater distance from the pivotal shaft than the link Y connecting the forward end of said lifter with the upper end of the lever B, and the stop-bars P P', having their 35 inner surfaces parallel to the axis of the shaft T, substantially as and for the purpose set forth.

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Witnesses:

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