

(No Model.)

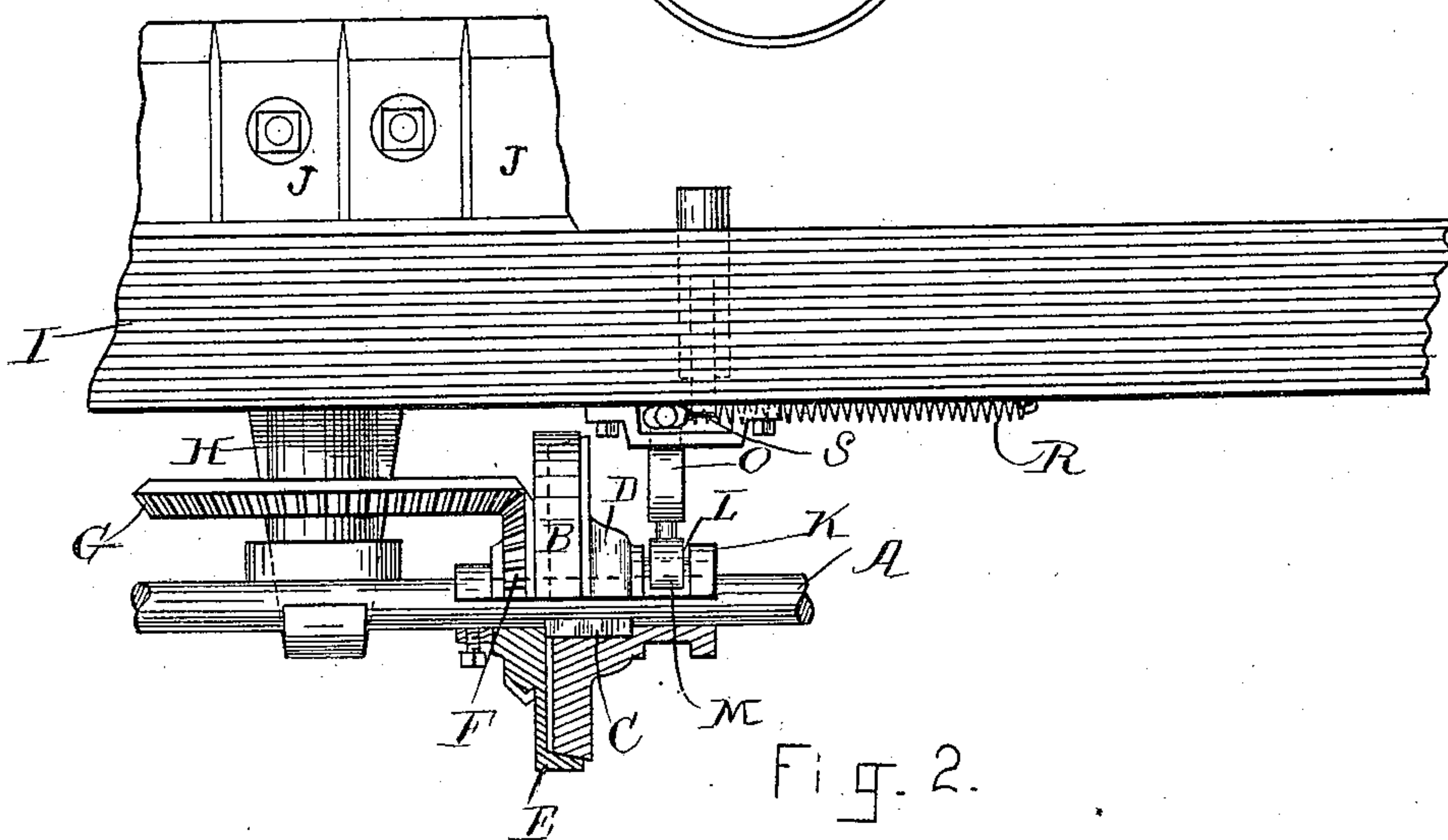
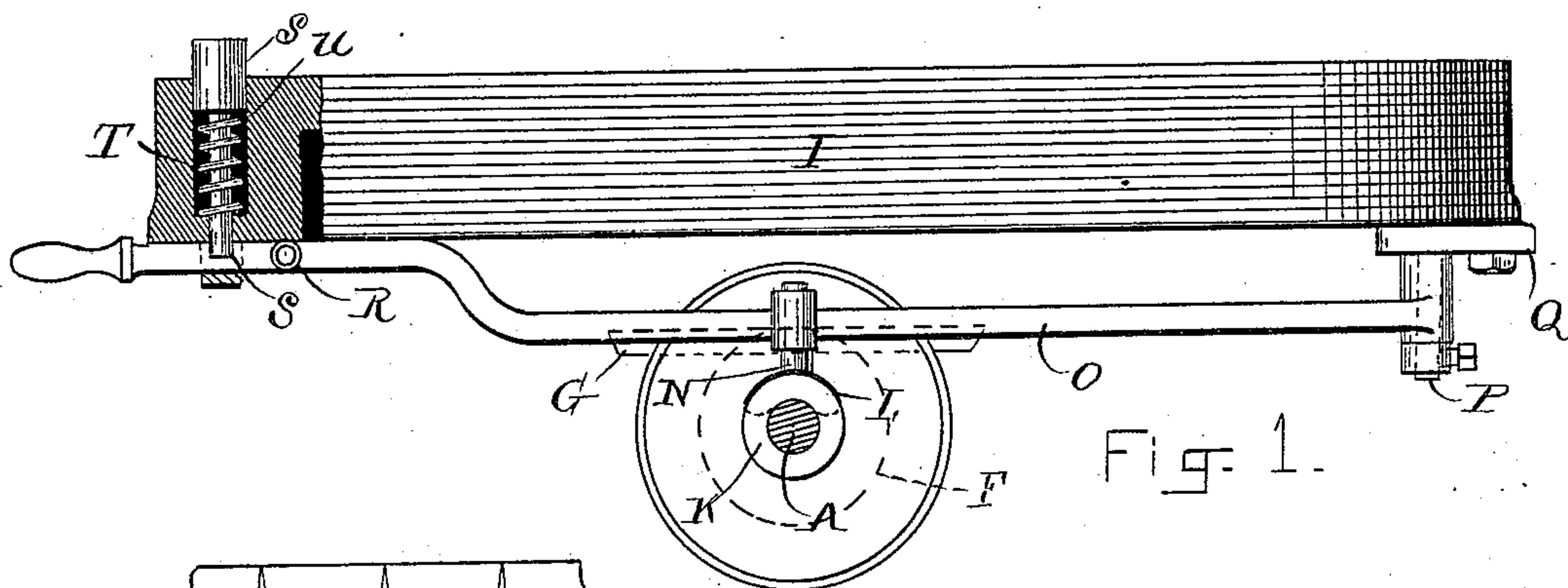
4 Sheets—Sheet 1.

J. S. CRANE.

STOPPING DEVICE FOR KNITTING MACHINES.

No. 397,973.

Patented Feb. 19, 1889.



WITNESSES:
Chas. S. Wooding.
J. H. Redmond.

INVENTOR:
John S. Crane
by Charles H. Drew
Atty.

(No Model.)

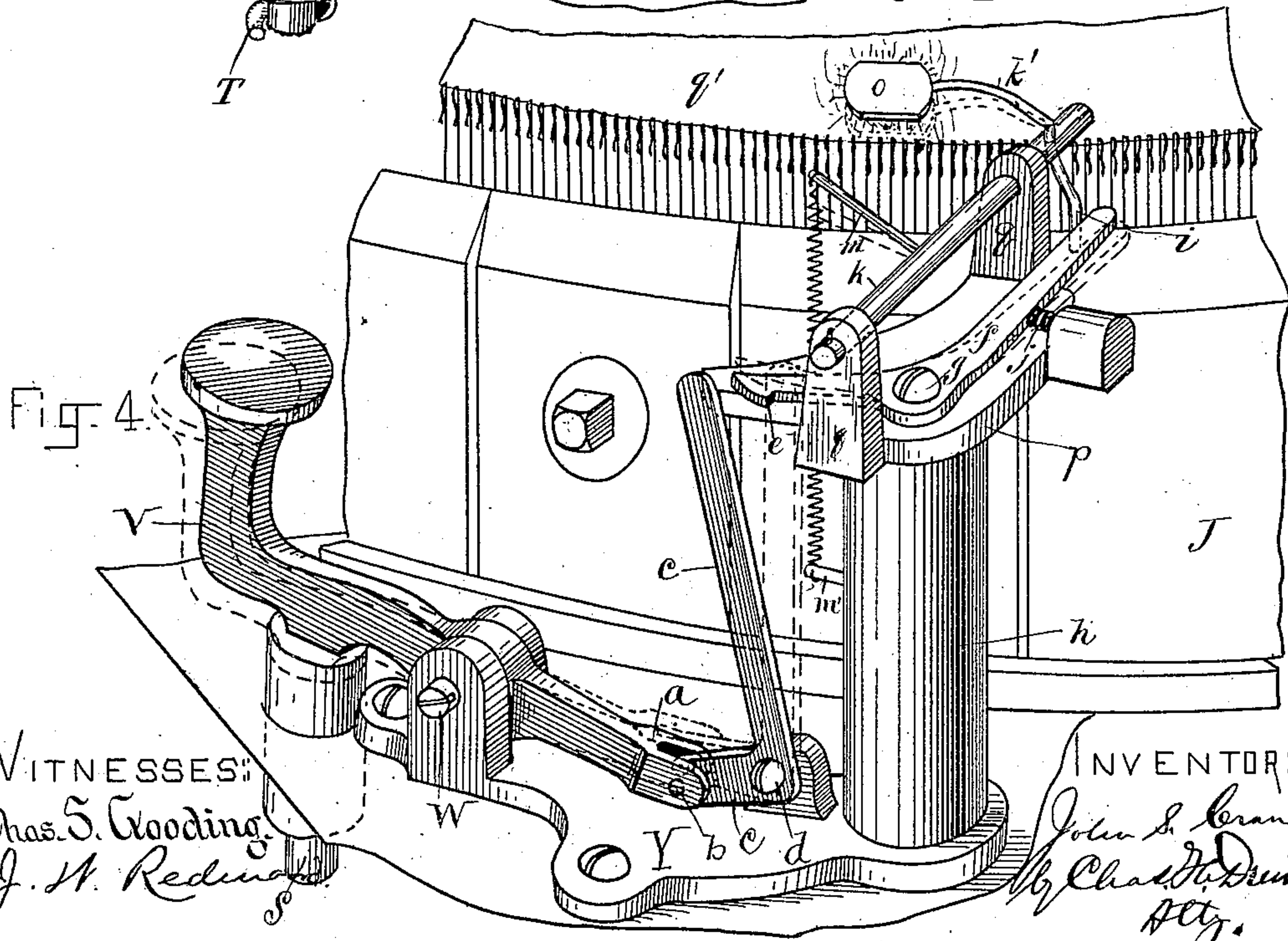
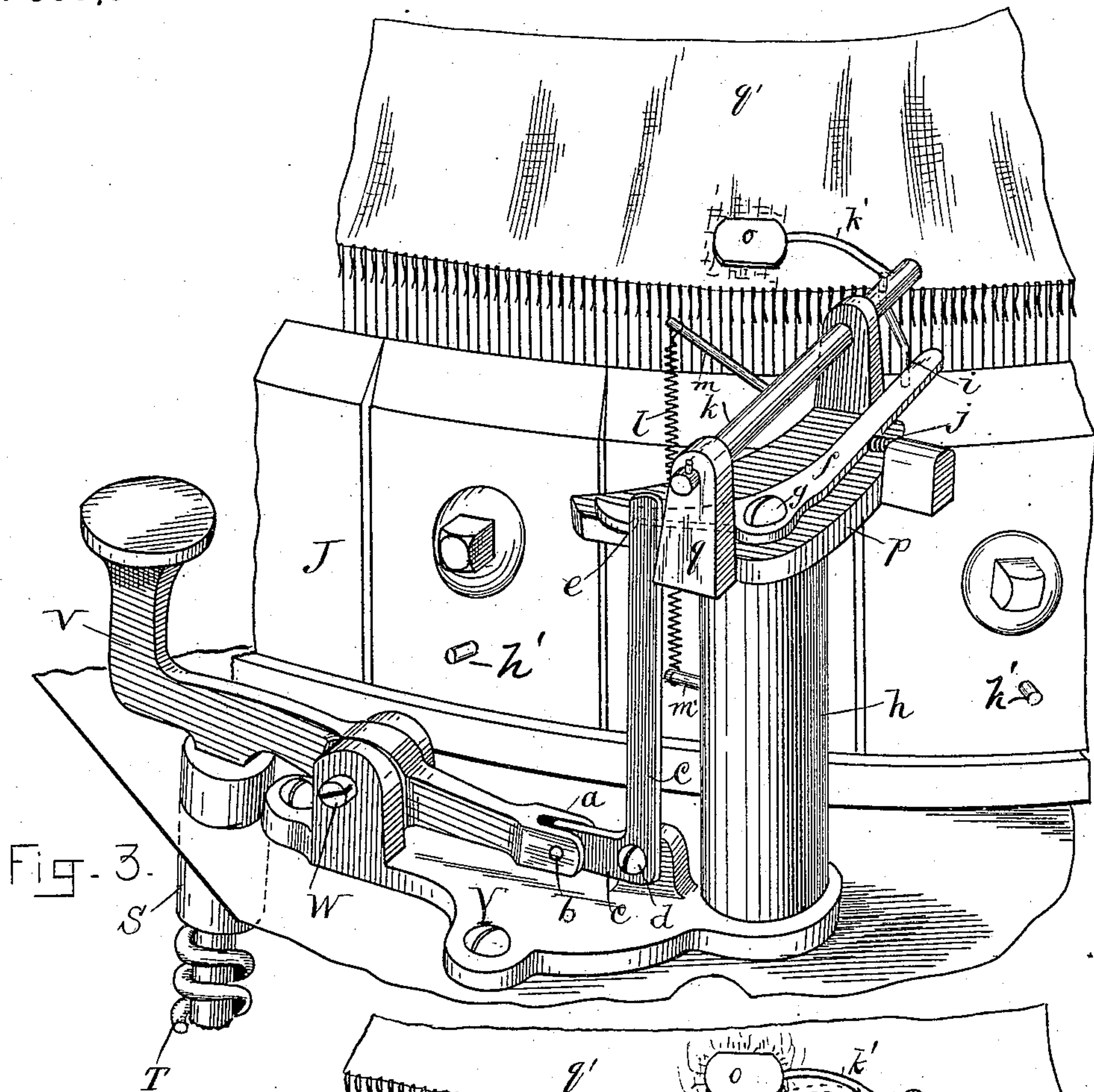
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J. H. Redman.

INVENTOR:

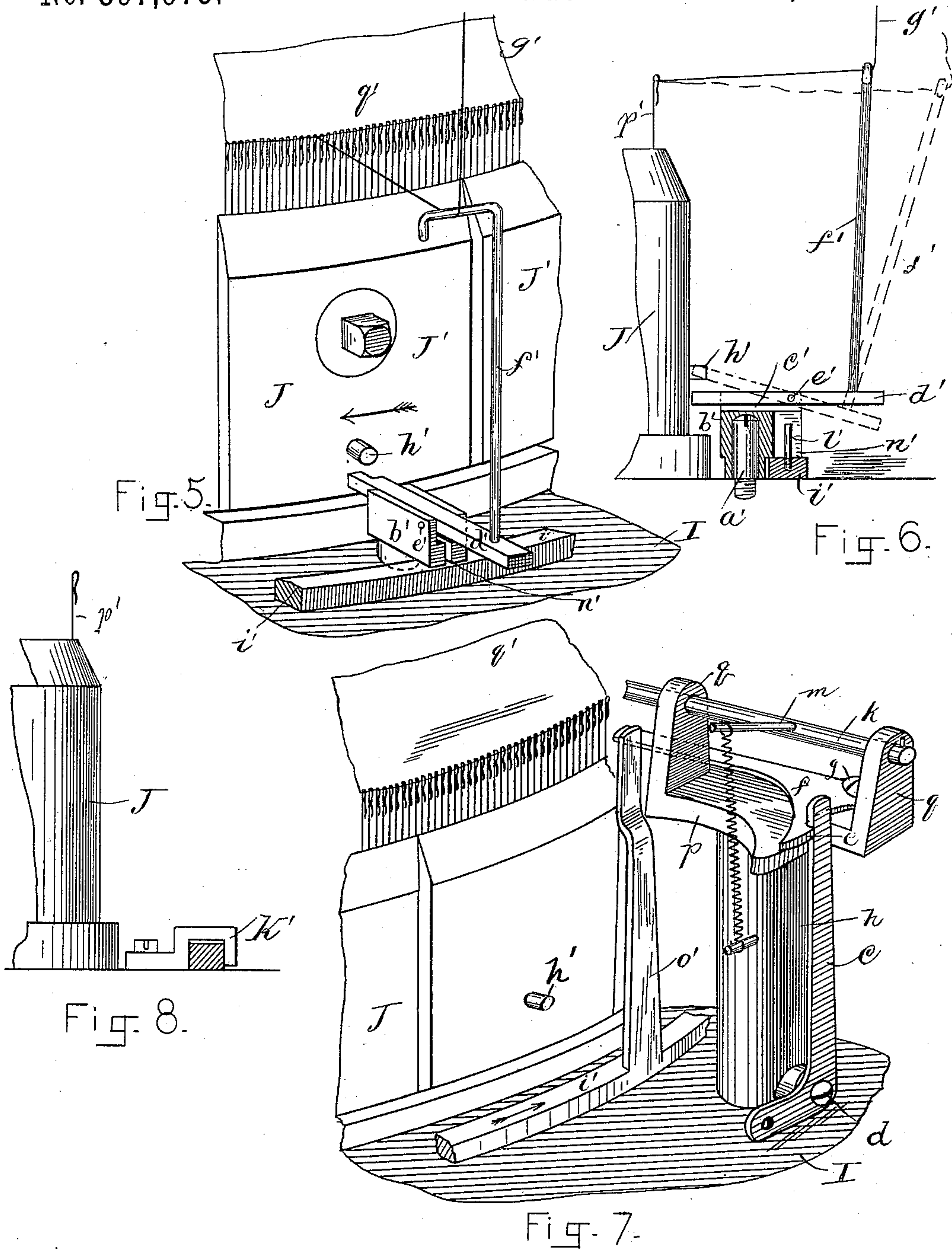
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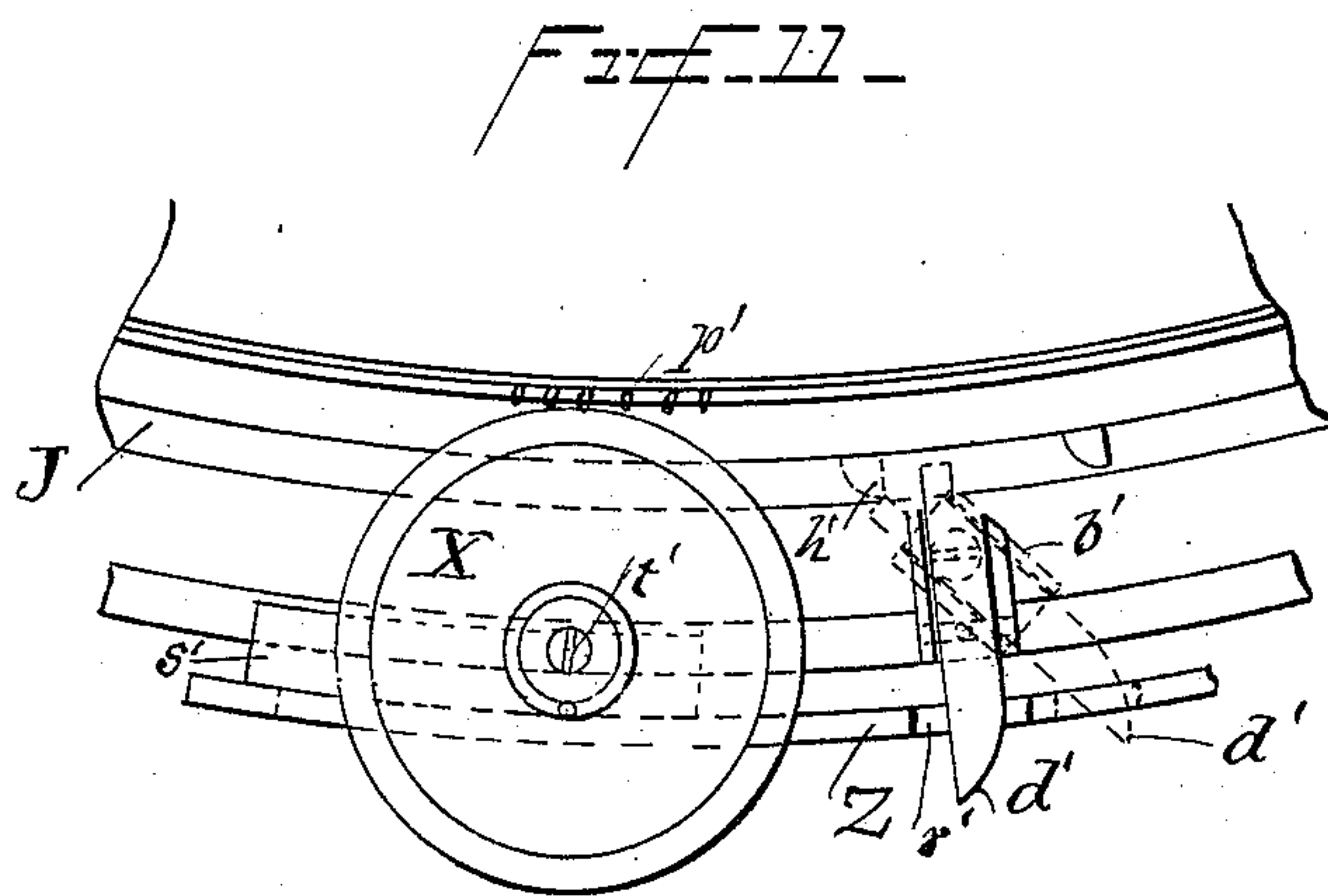
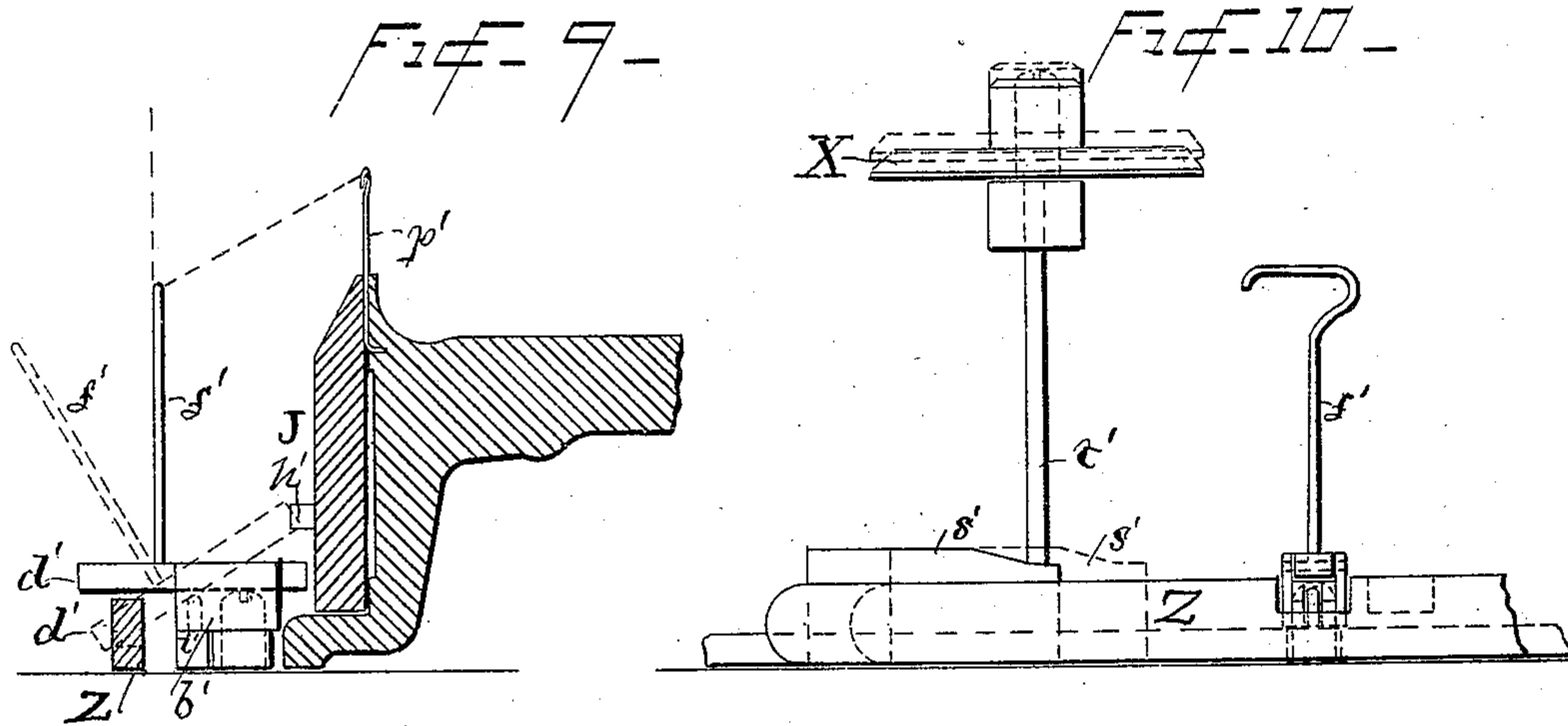
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WITNESSES—
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UNITED STATES PATENT OFFICE.

JOHN S. CRANE, OF LAKE VILLAGE, NEW HAMPSHIRE.

STOPPING DEVICE FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 397,973, dated February 19, 1889.

Application filed August 9, 1883. Serial No. 103,224. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. CRANE, of Lake Village, in the county of Belknap and State of New Hampshire, have invented certain
5 new and useful Improvements in Stopping Devices for Knitting-Machines, of which the following is a specification.

The first part of my invention has for its object a device which will instantaneously
10 stop a machine when a thread breaks and imperfect work would be produced if the machine were permitted to run, and it is designed to be attached to the class known as "circular-knitting machines;" and it consists
15 of a device having a block to be placed upon a stud on the bed-plate of the machine to which the stopping device is to be attached, so that it may turn on said stud, and a tilting lever attached by a fulcrum to the block and lying
20 in a groove therein, which lever has a thread-guide upon it, outside of the fulcrum, so that when the guide is disconnected with a thread the lever tilts down and its inner end rises up out of the groove and is struck by a stud on
25 the periphery of the cylinder, thus turning the block upon the stud on which it rests sufficiently to move a hoop or ring with which the block is connected by means of a perpendicular groove or slot on its outer end,
30 which grasps a pin on the hoop, whereby the machine is stopped through the instrumentality of a suitable unshipping device.

The second part of my invention has for its object a device for stopping a knitting-machine when the thread breaks so near the needles that the momentum of the head would carry the broken end of the thread past the
35 presser-wheel, so as to cause the work to run off the needles and produce an imperfection in it, and it is especially applicable to a knitting-machine embodying the invention of John Kent and Henry Leeson, numbered 160,685, dated March 9, 1875, employing three threads, the breaking of any of which would
45 cause an imperfection in the work produced. This part of my invention consists of the device above described, arranged by the swinging of the block, as before explained, to move a segment of a circle on the bed-plate of the
50 machine, which is recessed on its top edge to receive the outer end of the tilting lever

when it drops because of the breaking of the thread, for the purpose of imparting motion to said segment, and thereby to raise out of work the presser-wheel resting on a pin, which
55 pin rests on an incline on said segment, whereby it is raised for said purpose.

In the drawings, Figure 1 represents a side elevation, partly in section, of a portion of a knitting-machine, showing the shipping-lever
60 and part of the machine-operating devices. Fig. 2 represents a front elevation, also partly in section, of the same. Fig. 3 represents a perspective view of a portion of the knitting-machine and of the mechanism for releasing
65 the shipper. Fig. 4 represents a perspective view of the same after the shipper is released. Fig. 5 is a perspective view of parts, showing particularly the devices by means of which the mechanism for releasing the shipper is operated
70 when a thread breaks. Fig. 6 represents a sectional elevation of the same devices; Fig. 7, a perspective view of a portion of the knitting-machine representing the intermediate devices actuated by the thread-breaking
75 release mechanism and having connection with the mechanism for releasing the shipper. Fig. 8 represents a detail of construction in Figs. 1 and 2. Fig. 9 represents a vertical radial section of a part of the cylinder and
80 other parts in elevation, showing the tilting device arranged for lifting the presser-wheel from the needles when the thread breaks or gives out. Fig. 10 represents a side view of the presser-wheel and the means for raising
85 the same in connection with the tilting thread-guide. Fig. 11 is a plan of the parts shown in Fig. 10.

Like letters designate corresponding parts in all of the figures.

A is the main driving-shaft of the machine. On this main driving-shaft A is secured a clutch, B, one portion of which, D, can be moved freely from right to left, but which is prevented from rotating upon the said shaft
95 A by means of a spline, C. The other portion, E, of the clutch B is loose upon the shaft A, and has formed upon its surface a bevel-gear, F, which meshes into another gear, G, by means of which the upright shaft H is rotated. The
100 shaft H passes through the bed-plate I of the machine and is connected with the needle-

cylinder J, which is rotated by it. The portion D of the clutch B has formed upon it a collar, K, provided with a groove, L. In the groove L is a rider, M, provided with a stud, N, by means of which it is connected with the shipping-lever O. This lever O is pivoted to the frame I by means of a stud, P, formed on a bracket, Q, which is bolted to the frame I. The stud P stands at a slight angle to a perpendicular to the lever O, thus acting to keep the opposite end of the lever O pressed firmly against the frame I. The lever O is also provided with a spring, R, which draws it to the right, as in Fig. 2. To the right of the lever O is a stop, S, which presses upward through the bed-plate or frame I, having a shoulder, U, which forms a bearing for the spring T, the lower bearing for the spring being formed in the frame, as seen in Fig. 1.

The top of the stop S bears against a boss on the lower side of the lever V, Figs. 3 and 4. Said lever V is pivoted at W to a plate, Y, which is secured to the bed-plate I. The lever V terminates in a fork, a, which is secured by a pivot to the right-angled lever c, said lever c being pivoted to the plate Y at d. The upper end of the right-angled lever c is held in position by the notched end e of the lever f, said lever f being pivoted at g to a plate, p, which plate is formed on the standard h. The lever f is held in position by a spring, j. On the plate p are formed two ears, q q, in which is journaled the right-angled rod or lever k. On the arm k' of the lever k is a presser-foot, o, which is pressed against the knitted fabric q' by means of the spring l, which is fastened at its upper end to the pin m on lever k and at its lower end to the pin m' on standard h. An arm, i, fastened to the lever k, touches the lever f.

The operation of the above-described mechanism is as follows: Supposing the mechanism to be in the position shown in Fig. 3, the presser-foot o being pressed against the knitted fabric q' by the action of the spring l, and the needle-cylinder revolving, if from any cause there should be a hole in the knitted fabric the presser-foot o will be forced into it by the spring l, as shown in dotted lines in Fig. 4. The arm i will be moved against the lever f, causing said lever to turn upon its pivot g, so as to detach the notched end e from the right-angled lever c. The stop S, being no longer held down by the lever V, is forced upward by the spring T, thus freeing the shipping-lever O, which in its turn is moved to the right, Fig. 2, by the spring R. The shipping-lever O disconnects the portion D of the clutch B from the portion E. The bevel-gear F, being thus left loose upon the driving-shaft T, stops, and the needle-cylinder, which is turned by the bevel-gears F G and shaft H, must also stop. It will thus be seen and understood that whenever there is from any cause an imperfection in the knitted fabric the above-described operation will take place and the needle-cylinder will stop,

although the driving-shaft A still continues to revolve. Now, in order that the same result may occur upon the breaking of one or more threads, I provide a device illustrated in Figs. 5, 6, 7, and 8. On the bed-plate I, at a short distance from the needle-cylinder J, is a stud, a', which forms a bearing for the block or bracket b' to turn upon. The said block or bracket b' has a slot, c', in which the lever d' is pivoted at e'. To the outer end of the lever d' is fastened the thread-guide f'. On each of the plates J' J' are studs or projections h', which are placed at such a height as to clear the end of the lever d' when said lever is held in a horizontal position by the tension of the thread g'. If, however, the thread g' is broken or comes to an end for any reason whatever, the lever d', being heavier on the side of the pivot toward the thread-guide, will assume the position indicated by dotted lines in Fig. 6, thus bringing the end of the lever d' next to the needle-cylinder at such a height that it will be struck by the next pin h', thus turning the block or bracket b' upon the stud a'. A ring, i', extends part way around the needle-cylinder, having affixed to its upper side a pin or stud, l'. This stud l' is placed in a vertical slot, n', in the block or bracket b'. The said ring i' has two or more guides, k', Fig. 8, and also an upright arm, o', which is in contact with the lever f, as shown in Fig. 7. Now, it will be seen and understood that when the block or bracket b' is turned upon the stud a', as described above, the spring i' will be moved forward by the pin l' in slot n', and the arm o' will strike the lever f, turning the said lever about its pivot g, thus disconnecting the lever c and stopping the needle-cylinder by unshipping the clutch, as before described.

It will be seen that where more than one thread is used a corresponding number of devices similar to the above must be provided, all being connected to the same ring, i'. The device for raising the presser-wheel out of action when the thread breaks or runs out is illustrated in Figs. 9, 10, and 11. The tilting lever d'', when the thread breaks or runs out, drops into a shouldered notch, r', or its equivalent, in or on a movable bar, Z. On this bar is mounted or formed a cam, s', which supports a stud or standard, t', on which the presser-wheel X is pivoted. The lever d'', as it is turned by the action of the needle-cylinder, moves this bar Z, as indicated by dotted lines in Figs. 10 and 11, and the bar thus moved draws the cam s' under the standard t' and lifts it and the presser-wheel, as shown by dotted lines in Fig. 10, which movement carries the presser-wheel up out of action.

What I claim, and desire to secure by Letters Patent, is—

1. The combination, with a needle-cylinder having one or more stops projecting from its periphery, of a block turning on a vertical pivot secured to a stationary part of the machine, a lever mounted on the said block,

turning on a horizontal pivot of the same, and weighted to tilt outward and downward, a thread-guide mounted upon the said lever and adapted to tilt with the same, a ring or
5 hoop adapted to be engaged and moved by the pivoted block, and a belt-shipping mechanism constructed to be operated by the said ring or hoop, substantially as herein specified.

2. The combination of a needle-cylinder, J,
10 having stops *h' h'* upon its periphery, horizontally-swinging block *b'*, vertically-tilting lever *d'*, mounted on the swinging block, thread-guide *f'*, mounted on the tilting lever and tilting with the same, ring or hoop *i'*, adapted
15 to engage with the said swinging block and provided with the arm *o'*, lever *f*, adapted to engage with the said arm, lever *c*, adapted to engage with the said lever *f*, lever *V*, adapted to engage with the said lever *c*, stop *S*, bearing
20 on the said lever *V*, springs *R* and *T*, le-

ver *O*, and clutch *B*, substantially as and for the purpose herein specified.

3. The combination of a needle-cylinder provided with one or more stops or projections, a block pivoted vertically on a bed or
25 stationary part of the machine near the cylinder, a lever pivoted horizontally upon the said block, a thread-guide mounted upon the said lever, a presser-wheel, a lifting device connected with the standard which carries
30 the presser-wheel, and means connecting the said lifting device and the said lever, the lever being adapted to be tilted when the thread breaks or runs out and to engage with the connection between it and the presser-wheel
35 lifter, for the purpose herein set forth.

JOHN S. CRANE.

Witnesses:

S. C. CLARK,
THOS. HAM.