

(No Model.)

2 Sheets—Sheet 1.

A. WHITE & D. F. SULLIVAN.
STOP MOTION FOR CIRCULAR KNITTING MACHINES.

No. 587,351.

Patented Aug. 3, 1897.

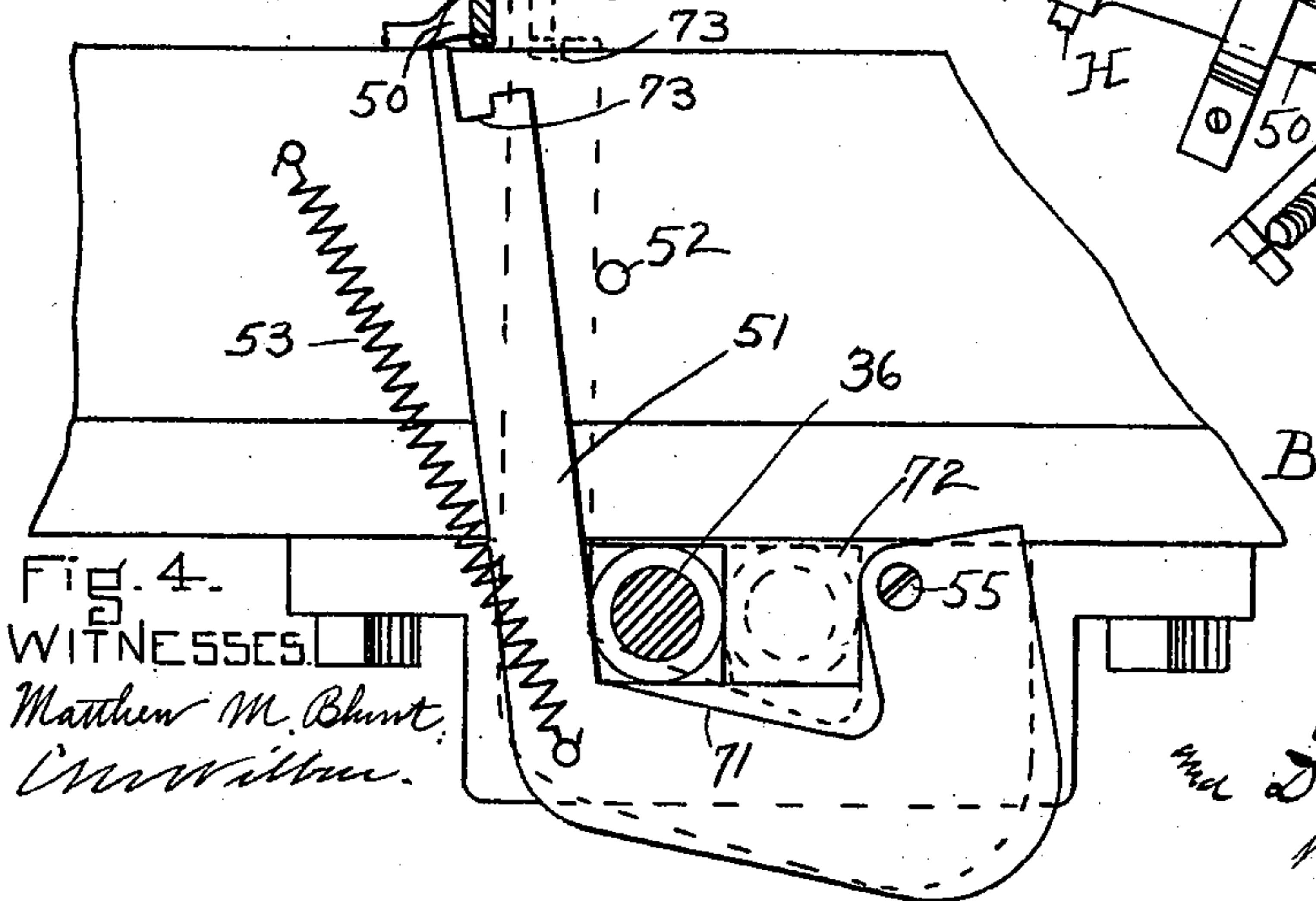
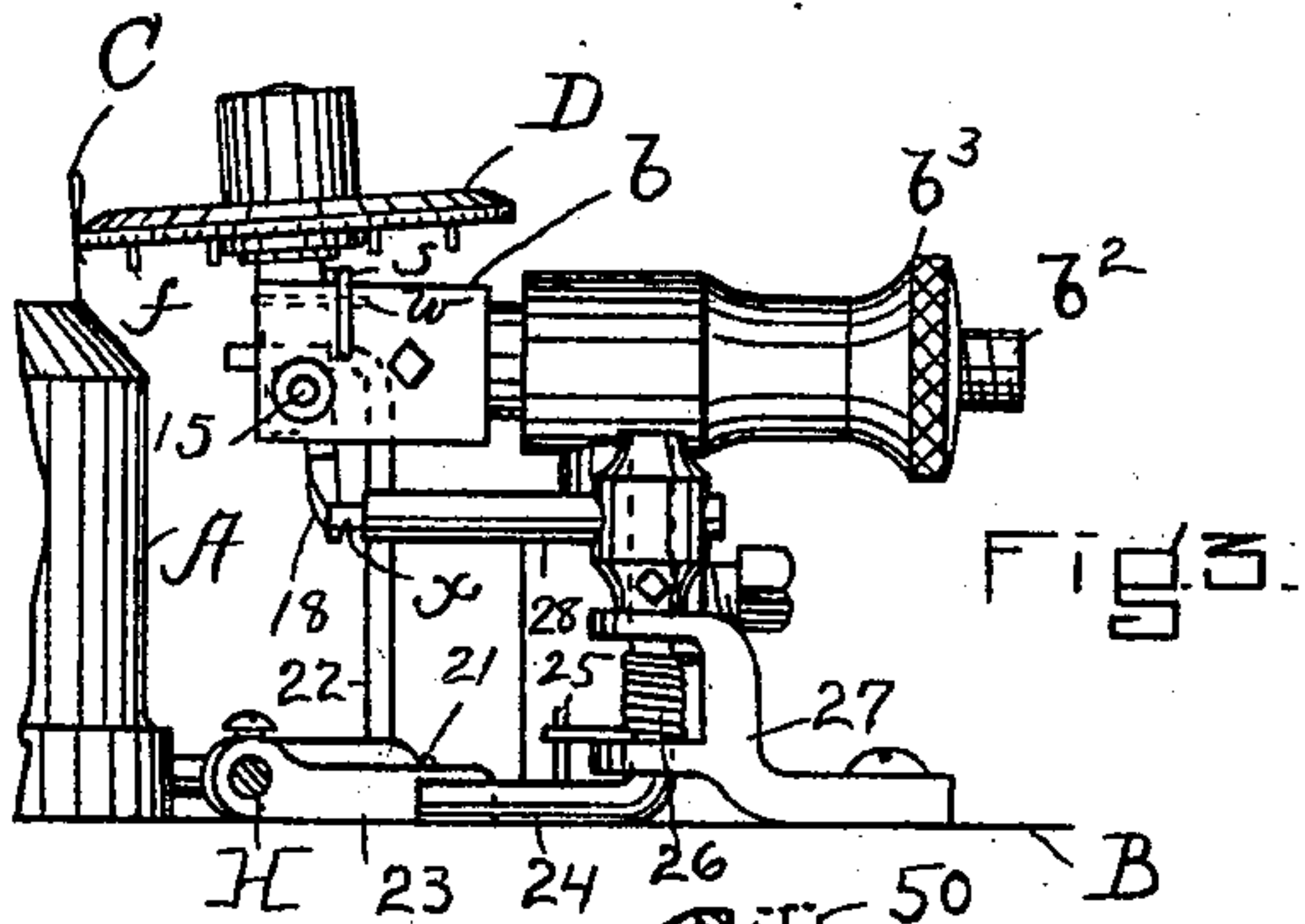
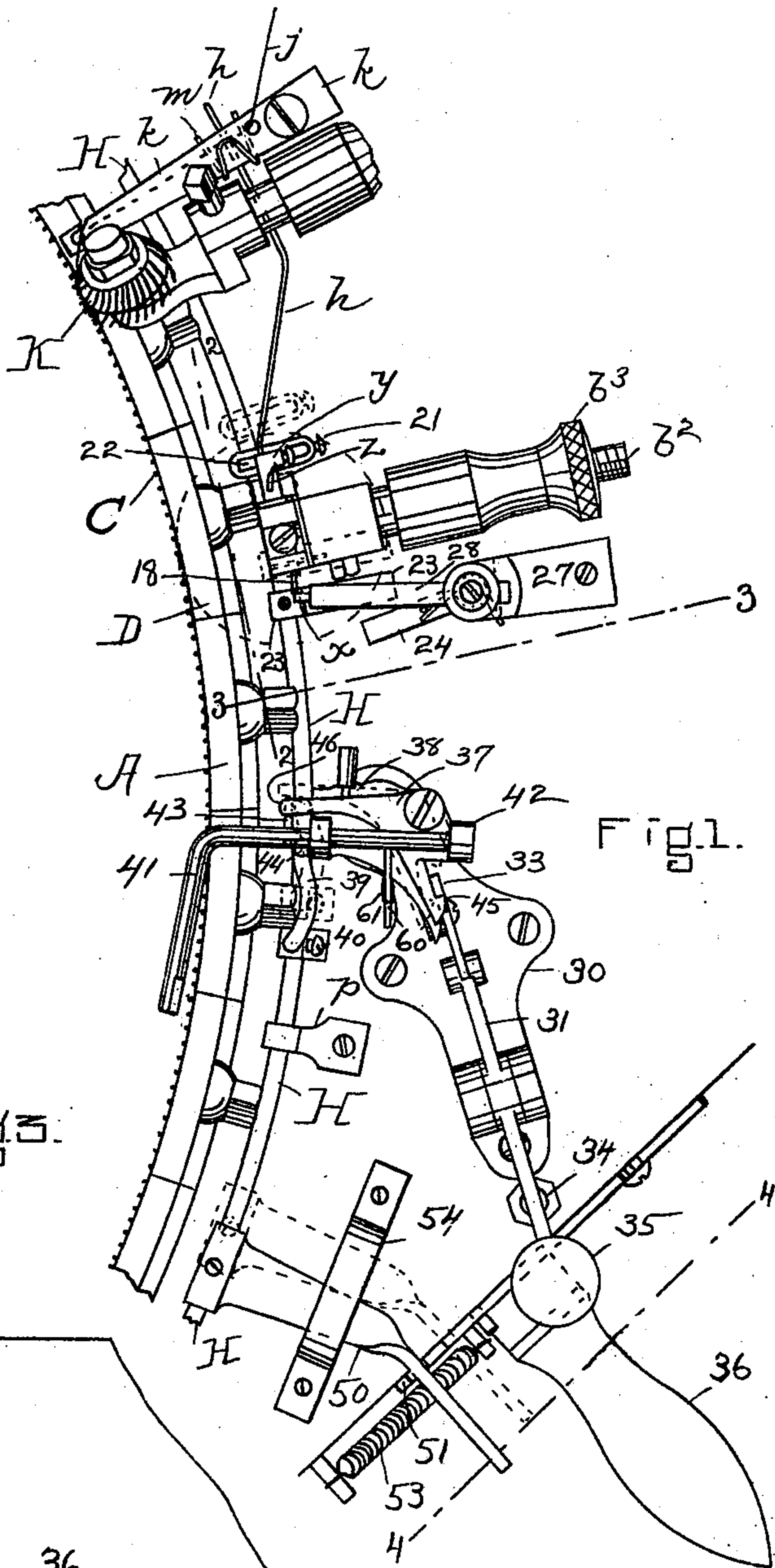
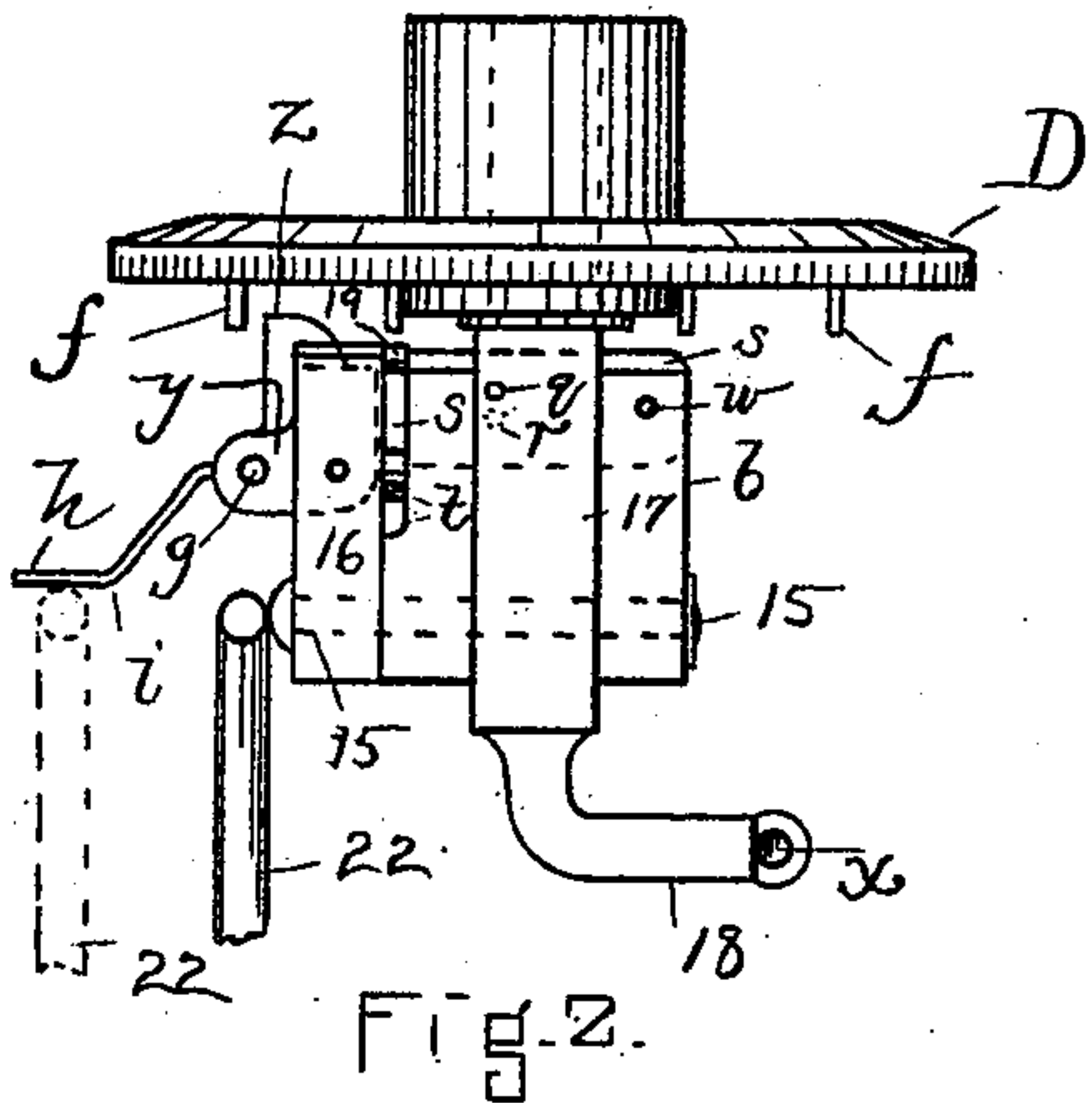


FIG. 4.
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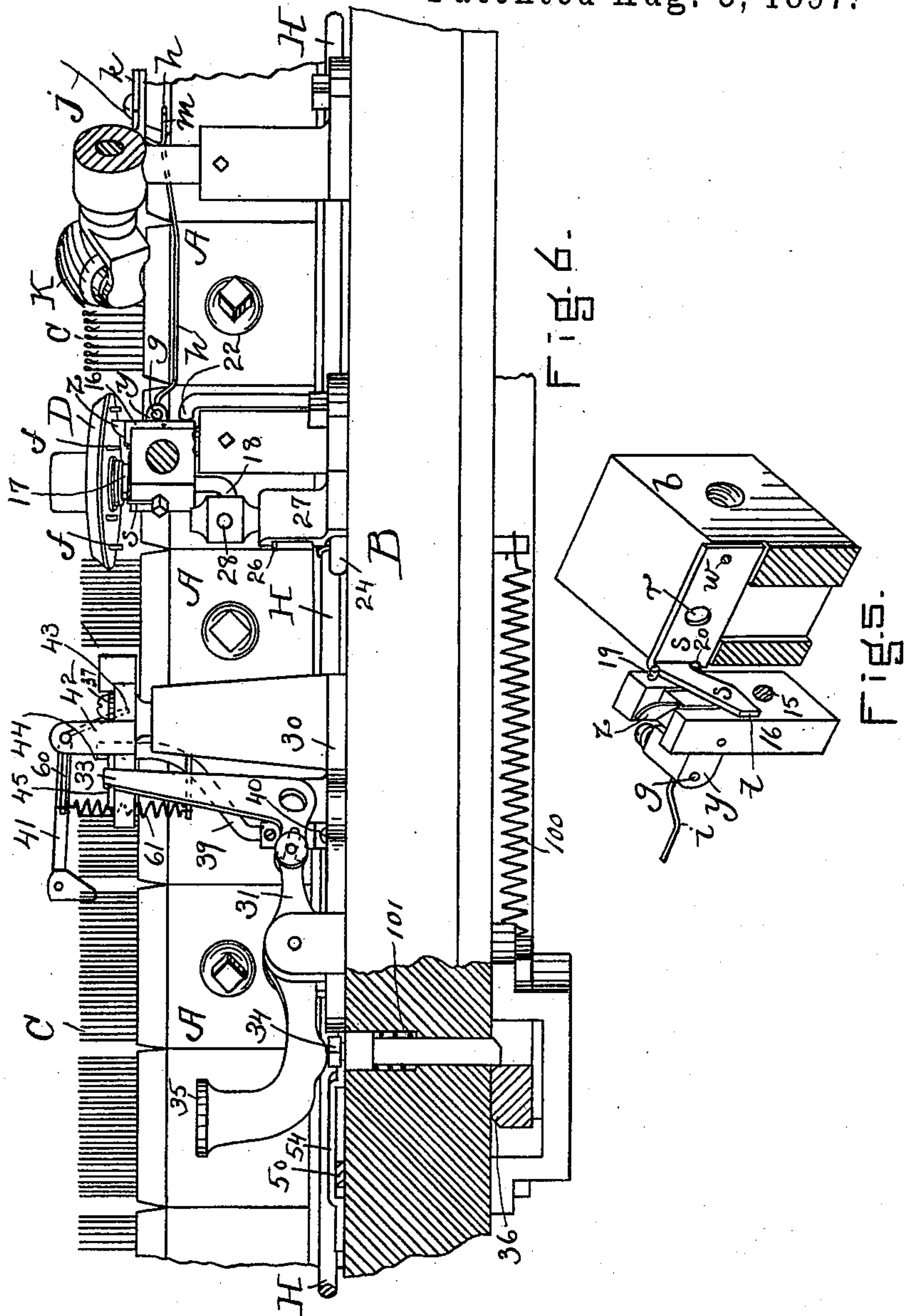
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2 Sheets—Sheet 2.

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STOP MOTION FOR CIRCULAR KNITTING MACHINES.

No. 587,351.

Patented Aug. 3, 1897.



WITNESSES.

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INVENTORS

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UNITED STATES PATENT OFFICE.

ALBERT WHITE AND DANIEL F. SULLIVAN, OF LOWELL, MASSACHUSETTS;
SAID SULLIVAN ASSIGNOR TO MARY SULLIVAN, OF SAME PLACE.

STOP-MOTION FOR CIRCULAR-KNITTING MACHINES.

SPECIFICATION forming part of Letters Patent No. 587,351, dated August 3, 1897.

Application filed September 17, 1896. Serial No. 606,121. (No model.)

To all whom it may concern:

Be it known that we, ALBERT WHITE and DANIEL F. SULLIVAN, of Lowell, in the county of Middlesex, State of Massachusetts, have made certain new and useful Improvements in Stop-Motions for Circular-Knitting Machines, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of a portion of the cylinder and bed of a circular-knitting machine, showing our improvement; Fig. 2, a side elevation looking to the right from line 2 2 in Fig. 1; Fig. 3, a like view on line 3 3 in Fig. 1; Fig. 4, an elevation, partly in section, on line 4 4 in Fig. 1; Fig. 5, a perspective view, partly in section, of the parts shown in Fig. 2, the presser-wheel being removed; and Fig. 6, an elevation looking toward the left in Fig. 1.

Like letters and numerals of reference indicate corresponding parts in the different figures of the drawings.

Our invention relates to automatic stop-motions for circular-knitting machines and is an improvement on the mechanism shown and described in United States Letters Patent No. 559,505, dated May 5, 1896, and granted to said Daniel F. Sullivan for such mechanism.

An object of our invention is to provide means whereby the ordinary hand-shipper and the common mechanism which is released automatically when an imperfection or hole occurs in a course may both be employed independently of our mechanism, which comprises a release operated by the breaking of a thread, and also in conjunction therewith.

In the drawings, A represents the needle-cylinder, B the bed of the machine, C the needles, and D the presser-wheel, these being all arranged in the usual positions.

On the bed, in suitable brackets *p*, a curved rod or ring H, extending around the cylinder, is fitted to slide. This ring is bent to conform to the arc of the cylinder and extends nearly or quite around the cylinder and connects with one or all the feeds passing under

the support of the loop-wheels K and the thread-guides. The usual hand-shipper 36, pulled by a spring 100, is stopped by a vertically-playing pin 34, pushed upward by a spring 101, (see Fig. 6,) and which is held depressed by one arm of a vertically-swinging bell-crank 31, pivoted to plate 30 and provided with a thumb-piece 35. Pivoted to the inner end of this lever, under the base, there is a vertical latch-arm 33, with which the hook end 45 of a horizontally-swinging bell-crank 37 engages. The arm 46 of the lever 37 is engaged by a spring-pushed pin 38, (see Fig. 1,) holding the latch locked against the pressure of the pin 34, and said arm also projects over the ring H. An angle-lever 41 is mounted to rock in suitable bearings 42, its free end being in position to engage and rest on the web. An arm 60 on said lever, pulled by a spring 61, tensions this engagement, and a pin 43 (shown dotted in Fig. 6) on said lever is in position to engage the arm of the bell-crank 37 and throw it into the position shown by dotted lines in Fig. 1, thus unlatching the lever 31 and freeing the pin 34, whereby the shipper 36 is released, when said lever 41 is rocked by the dropping of its free end into a hole or imperfection in the web. The parts thus far described are a well-known form of stop-motion in ordinary use and with which our improvement acts in conjunction.

Pivoted at 55 on the edge of the bed there is a hook-shaped lever 51, having a cam edge 71 in position to be engaged by a cam-block 72 on the hand lever or shipper 36 when said shipper is moved from right to left, as viewed, in order to start the machine. This lever 51 is pulled by a spring 53, connecting it with the bed, and its movement is limited by a stop 52.

On the ring H a horizontal arm 50 is fast and projects over the edge of the bed with its free end in position to be engaged by the free end of the lever 51. On said ring H, and carried thereby, there is also a vertical rigid arm 39, Fig. 1, the upper end 44 (see Fig. 1) of which projects in front of the bell-crank arm 46, so that when said ring H is moved in one direction a determined distance it will actuate the bell-crank and unlatch the locking mechanism of the shipper 36, before described. The distance between the end 44 of

this arm and the bell-crank is such, however, that they will not contact when the shipper 36 is moved by hand, as hereinafter specified.

A spindle b^2 carries a block b on its inner end and is adjustable longitudinally in its bearings on the bed by a star-box b^3 .

The presser-wheel D is mounted to rotate on a spindle pivoted at 15 to rock in said block and is normally held tilted with its periphery in engagement with the needles C, as in Fig. 3, by a pin q , (see Fig. 2,) which bears against a vertically-swinging right-angle lever s , (see Figs. 2 and 5,) pivoted at w in the block, said pin resisting the pressure of the needles against the wheel until it is allowed to fall away from the needles by an upward movement of lever s , which registers a recess r therein with the pin, as hereinafter described.

A support 16 is mounted on the pivot 15 to rock in the same direction as the support of the wheel D, and pivoted to rock in a direction at right angles thereto there is a lever y , provided with a vertical cam-blade z on its upper end, which may be thrown into the path of fingers f on the presser-wheel. This lever y carries at g a wire drop-arm h , which projects under the support of the looper K and under the thread-guide k , its free end resting on the thread j . It will be understood that one of these wires and conjunctive mechanism is arranged at each presser on the head. Two wires m on the guide pass under the thread at either side the drop-wire h , which is bent downwardly and horizontally, forming a shoulder i . The support 16 is provided with two pins 19 and 20, (see Fig. 5,) between which the free end of the angle-lever s works and by which said lever s is moved vertically to unlock and lock the presser-wheel support.

On the ring H there is a fast arm 23, and in a bracket 27 on the bed an angle-arm 24 is mounted to rock horizontally and is tensioned by a torsion-spring 26, one end of which engages a pin 25 on said arm, as shown in Fig. 3. This spring tends to move the ring H toward the thread-guide. On the upper end of the arm 24 a horizontal arm 28 is adjustably secured, the free end of said arm being reduced at x and in position to engage and act as a stop for the end 18, Fig. 2, of the rocking support of the presser-wheel offset for this purpose.

A vertical rod 22, fast on the ring H and adjustable by a set-screw 21, has its upper end bent at right angles and will pass under the shoulder i of the drop-wire h and support said arm when a stop occurs from causes other than the breaking of a thread.

In the use of our improvement, the parts being in the position shown and the machine in operation, the shipper 36 may be employed by hand in the usual manner, being first slightly depressed to pass under pin 34 and then moved from left to right, as viewed. This frees the hook-shaped lever 51, permit-

ting the spring 53 to elevate it, driving the ring-arm 50 a distance determined by the stop 52 and moving the ring correspondingly. This projects the vertical rod 22 under the shoulder i of the drop-wire h sufficiently far to prevent said wire from dropping when the thread j slacks at the stopping of the machine and thus preventing operating of the presser-wheel mechanism; but this movement of the ring is not sufficient to contact the arm 39 with the latch-lever and thereby release the latch 37. This same effect is produced when the shipper is released by the rocking of the lever 41 as a hole occurs in the web, as above described, it being understood, however, that when said lever 41 rocks it operates the latch mechanism, the purpose of the hook-lever 51 and its movement of the ring being solely to project a support for the drop-wire when either the shipper is operated by hand or by the action of the angle-lever 41. On retracting the hand-shipper to start the machine the hook-lever 51 is thereby reciprocated. The sliding ring H is then drawn back by hand, freeing the drop-wires from the supporting-arms 22. When a thread breaks, the wire h will drop, rocking the lever y and throwing its blade z into the path of the fingers f on the presser-wheel D. Said fingers, engaging the blade, cause the support 16 to rock toward the needles on pivot 15 and permit the fingers to pass. This motion has meanwhile caused pin 20 on the support 16 to throw the right-angle lever s upward until the hole r therein registers with the pin q on the support 17 of the presser-wheel. This relieves the wheel, and the spring of the needles C will now throw said wheel outward, freeing the arm 18 on its support from the stop-arm x . The spring 26 will now act torsionally on the arm 24 and drive the ring H sufficiently far for the rigid rod 39, carried thereby, to engage and throw the arm 46 of the bell-crank 37, unlatching the same from the bell-crank 33 and freeing the pin 34 from lever 31, permitting spring 101 to act on said pin. This frees the spring-pulled hand-shipper 36, which immediately operates to stop the machine in a manner which will be understood by those conversant with such matters without a more explicit description.

In setting the device, in addition to moving the hand-shipper, as before, the ring is retracted by hand and the presser-wheel is rocked against the needles. It will be seen that the ring may be moved independently by hand sufficiently far to support the drop-wires and that by our improvement the usual stop-motions may also be employed independently, as well as actuated by the breaking of a thread.

We do not wish to be confined to employing a continuous ring, as a sliding rod of any suitable length for the purpose may be used.

Having thus explained our invention, what we claim is—

1. In a stop-motion for knitting-machines a thread-supported drop-wire in combination with a sliding rod provided with a projection

adapted to be engaged with and support said wire substantially as described.

2. In a stop-motion for knitting-machines a thread-supported drop-wire in combination with a sliding ring carrying a support for said wire and adapted to be moved by hand to disengage the same; and mechanism released by the dropping of said wire for engaging said support substantially as specified.

3. In a stop-motion for knitting-machines a thread-supported drop-wire; a spring-actuated shipper; locking mechanism therefor, a sliding ring carrying a support for the wire; and mechanism released by the dropping of the wire for actuating said ring to release said locking mechanism and engage said support with said wire all being combined substantially as set forth.

4. In a stop-motion for knitting-machines, a hand-shipper in combination with a thread-supported drop-wire; a sliding ring; a spring-reciprocated lever for moving said ring and operated by said shipper; and a projection on the ring for engaging the drop-wire substantially as and for the purpose specified.

5. In a stop-motion for knitting-machines, a sliding ring on the base in combination with the drop-wire; a projection on the ring for engaging said wire at a determined point in its movement; the hand-shipper; and mechanism

operated by the release of said shipper for moving said ring substantially as specified.

6. The rocking lever, 41, the shipper and their connecting mechanism, in combination with a sliding rod; a thread-supported drop-wire; a projection on the ring for engaging said wire; and mechanism released by the movement of the shipper for actuating said ring substantially as described.

7. The combination with the tilting presser-wheel; of a drop-wire released locking mechanism therefor; a sliding ring; a shipper released by a movement of said ring; and a spring-actuating mechanism for the ring normally retracted by the support of said wheel substantially as set forth.

8. The combination with a tilting presser-wheel and its locking mechanism, of a sliding ring; a spring-actuated mechanism for moving said ring; a projection on the support of said wheel for locking said mechanism; a shipper and locking mechanism therefor released by the movement of said ring substantially as described.

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