

No. 630,289.

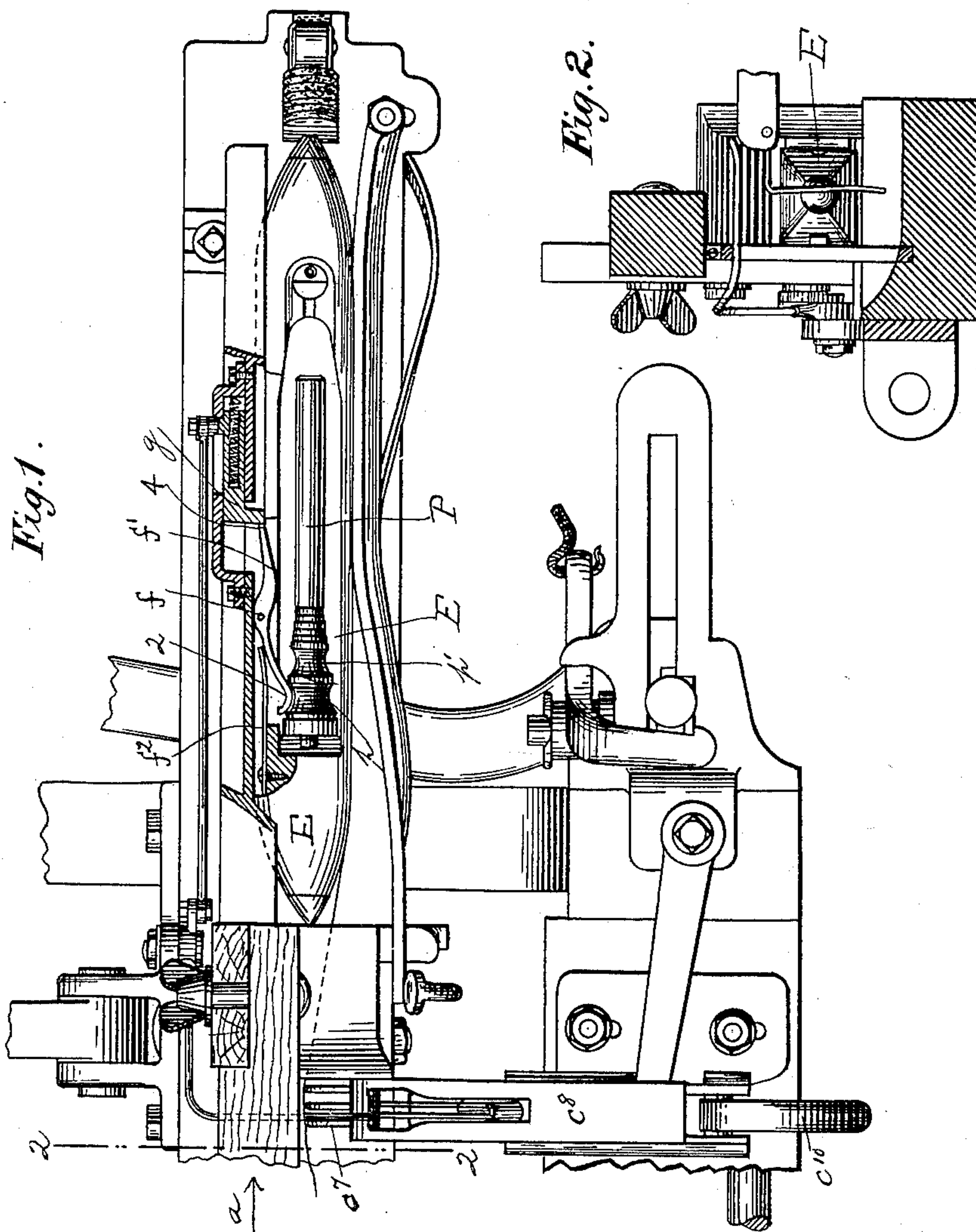
**Patented Aug. 1, 1899.**

**R. CROMPTON.**  
**LOOM.**

(Application filed Jan. 11, 1899.)

1 (No Model.)

3 Sheets—Sheet 1.



Witnesses.  
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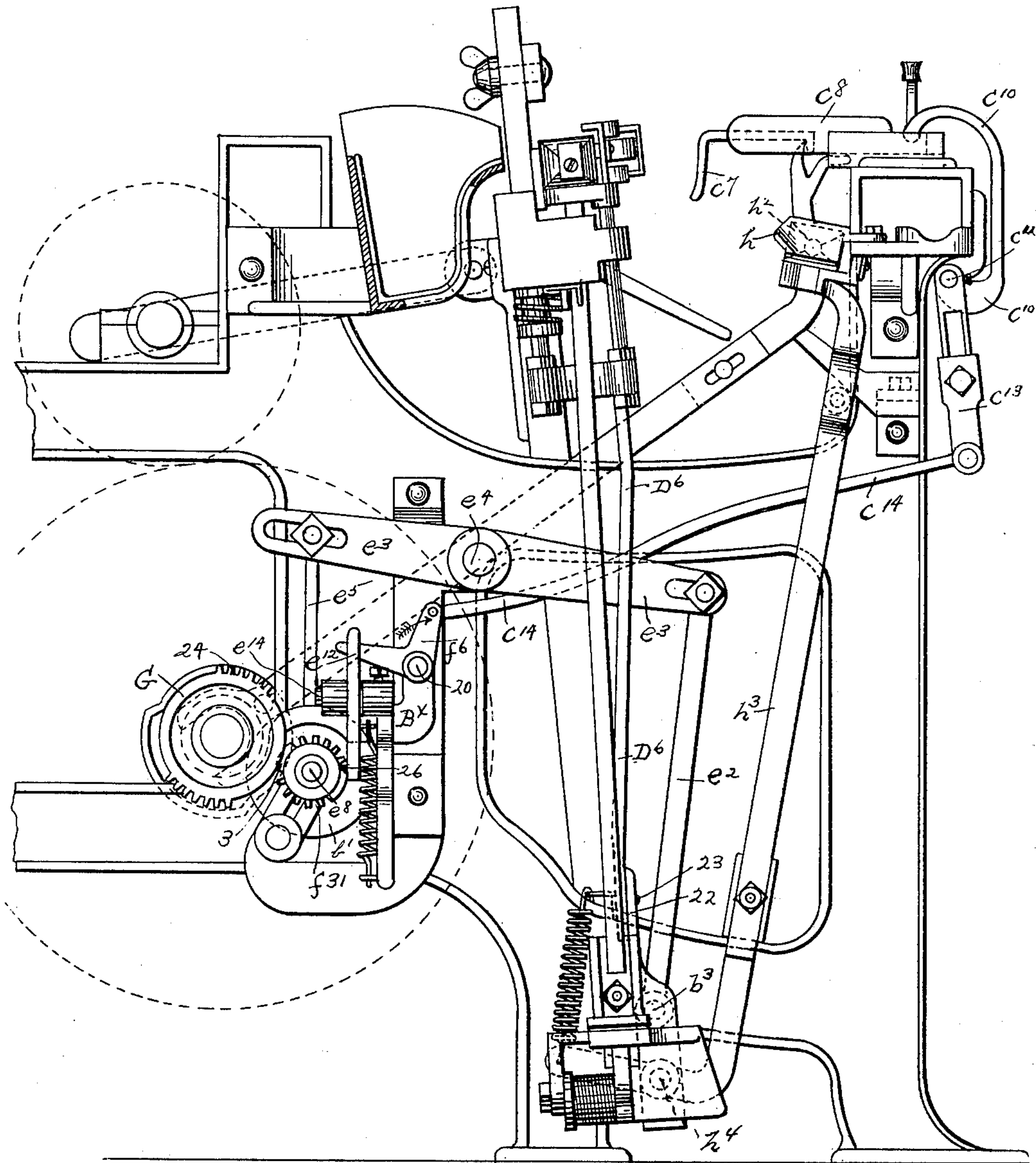
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*Fig.3.*



WITNESSES.

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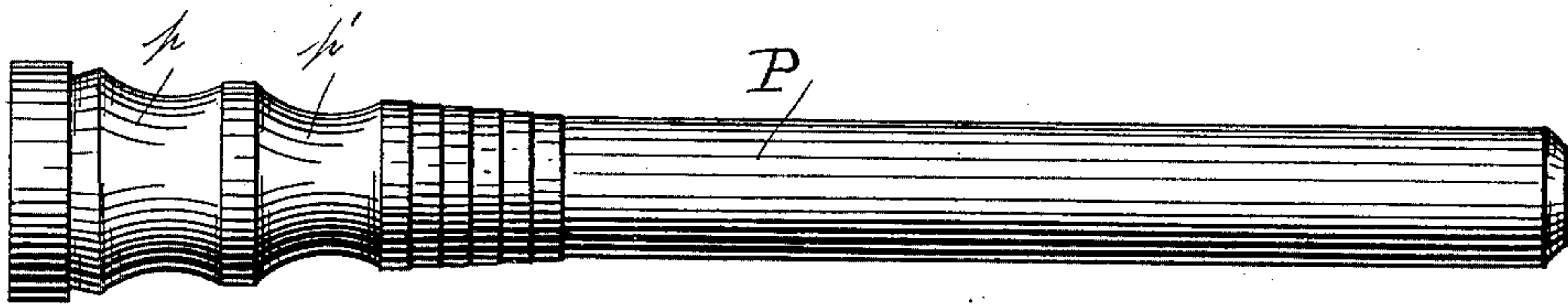
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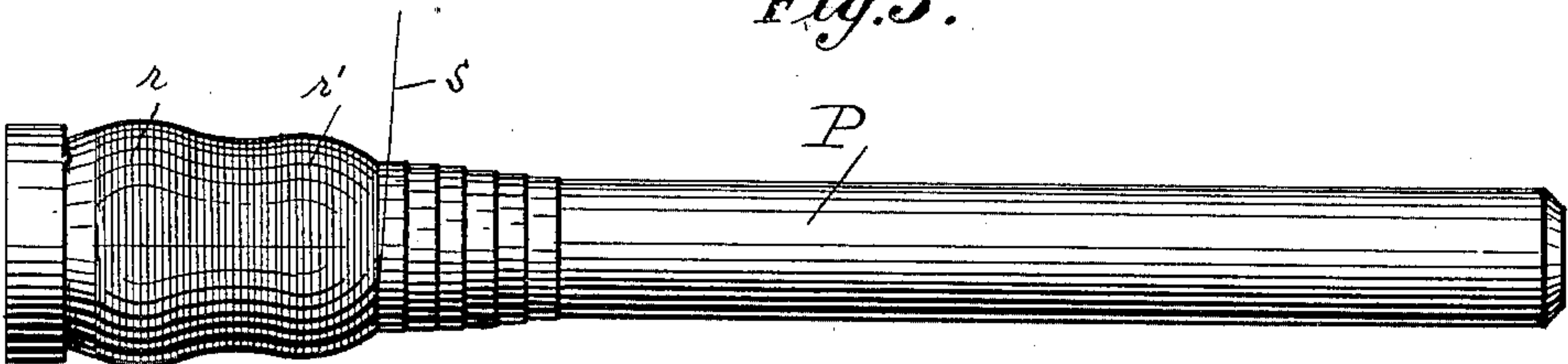
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*Fig.4.*



*Fig.5.*



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# UNITED STATES PATENT OFFICE.

RANDOLPH CROMPTON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO  
THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

## LOOM.

SPECIFICATION forming part of Letters Patent No. 630,289, dated August 1, 1899.

Application filed January 11, 1899. Serial No. 701,826. (No model.)

*To all whom it may concern:*

Be it known that I, RANDOLPH CROMPTON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Looms, of which the following is a specification.

My invention relates to looms, and more particularly to stop-motions for looms of the class shown and described in United States Letters Patent No. 609,257, in which the shuttle carries a feeler, which when the filling on the bobbin has been nearly exhausted actuates a device which through intermediate mechanism operates to stop the loom, or in case of a loom provided with shuttle-supplying mechanism to automatically operate said mechanism to supply another shuttle.

It has been found in practice in using a feeler in a shuttle to stop the running of a loom, to change a shuttle, or insert a bobbin into a shuttle before the filling becomes exhausted, or to automatically supply another shuttle that the gradual withdrawal of the filling on the bobbin from under the feeler as the loom operates moves the feeler so slightly at each pick of the loom that the time for stopping the loom or operating the shuttle-supplying mechanism before the filling on the bobbin is entirely exhausted is not determined with sufficient accuracy. It has also been found in practice that while a sample shuttle may be fitted with a detector-feeler and a filling-carrier or bobbin, which with careful adjustment will act to stop the loom and leave but a pick or two wound on the bobbin, yet with the large number of shuttles required in an ordinary weave-room containing several hundred looms, and especially with the thousands of bobbins or filling-carriers interchangeably used in the shuttles, that it is not practicable to adjust the detector-feeler in each shuttle so closely or finely that it will coöperate with any bobbin or filling-carrier which at random might be inserted into the shuttle and have the feeler act with certainty to stop the loom in every instance before the filling is exhausted from the bobbin. In order to overcome this difficulty and to enable a loom fitted with the feeler device above referred to to produce

perfect cloth in the weaving, I provide the bobbin at the point where the end of the feeler presses with a greater thickness of filling, so that each pick of the shuttle carrying the feeler will so reduce the filling at the point where the end of the feeler engages it that the feeler will be moved sufficiently to act effectively to stop the loom at the proper time or operate the shuttle-supplying mechanism before the filling is entirely exhausted.

I preferably provide the bobbin at the point where the end of the feeler presses upon it with a circumferential groove or recessed portion, which during the process of winding the filling upon the bobbin is filled with a greater quantity of filling, and therefore may be termed a "reservoir."

By the use of the circumferential groove or reservoir in the bobbin for the reception of the first-wound portion of filling and by so placing the end of the feeler that it will contact with the filling in the groove I am enabled when the filling is so far exhausted as to leave remaining only that which is contained in the groove to quickly withdraw sufficient of that amount at a few picks of the shuttle or from the time the shuttle leaves the shuttle-box in which is carried the actuating device until it returns again, so that the movement of the feeler will be so pronounced or sufficiently defined as to engage with certainty the actuating device, and I believe I am the first to combine with a shuttle a bobbin provided with a circumferential groove carrying a small portion of the first-wound filling thereon and having the end of a detector-feeler over the groove and retained in its normal position by the filling in the groove until by the quick removal of the filling therefrom the free or opposite end of the feeler will be promptly placed into operative engagement with the actuating mechanism at the time the shuttle enters its box and cause the shuttle-supply mechanism to be made operative.

After the withdrawal of the filling from the groove or recessed portion in the bobbin in the operation of the loom there may not be enough filling left on the bobbin to prevent its being exhausted before the bobbin is changed. I therefore preferably provide a



second circumferential groove or recessed portion in the bobbin contiguous to the first-mentioned groove, which will be exhausted after said first-mentioned groove, so that it will after the exhaustion of filling from the first groove or reservoir act as a supplemental reservoir to supply a number of picks of filling after the feeler has operated and before the shuttle stops, and I employ a filling-detector or feeler which will cause intermediate mechanism to act at a predetermined point to place the filling-fork into position to be engaged with the hammer to move the slide and rock the shaft, so that after the next throw of the shuttle and while it is in the end of the lay opposite from that where the detector-feeler was operated the running shuttle will be removed from the running-shuttle box and a fresh shuttle substituted.

I have shown in Figures 1 and 2 of the drawings the same parts of the loom shown in Figs. 1 and 2 of the Patent No. 609,257, above referred to, except that a bobbin embodying my improvements is substituted for the bobbin shown in said patent.

I have shown in Fig. 3 of the drawings the same parts of the loom shown in Fig. 2 of Patent No. 614,369, of November 15, 1898, which has a shuttle-supplying mechanism and which may be combined with the parts of the loom shown in Figs. 1 and 2 herein provided it is desired to use my improvements with a loom having an automatic shuttle-supplying mechanism.

My improvements may equally well be used with a loom which does not have a shuttle-supplying mechanism or with a loom having a filling or bobbin supplying mechanism as distinguished from a shuttle-supplying mechanism.

Referring to the drawings, Fig. 1 is a top or plan view of a portion of a loom at the right-hand side of the loom, showing the stop-motion of said Patent No. 609,257 and my improved bobbin in the shuttle. Fig. 2 is a sectional end view of some of the parts shown in Fig. 1 on line 2 2, looking in the direction of arrow *a*, same figure. Fig. 3 is a left-hand end view of a loom embodying the shuttle-supplying mechanism of Patent No. 614,369, above referred to. Fig. 4 shows a bobbin full size embodying my improvements, and Fig. 5 shows a modified formation of the filling-reservoir.

In the accompanying drawings the several parts shown in Figs. 1 and 2 correspond with the parts shown in the drawings of the Patent No. 609,257, as above stated, except for the bobbin shown in said patent a bobbin embodying my improvements is shown. The shuttle *E* has the pin or pivot-pin *f*, on which is mounted the feeler *f'*, having a rounded end 2 to contact with or engage the filling on the bobbin. A spring *f<sup>2</sup>* bears on the feeler *f'* and acts to keep the end 2 against the filling on the bobbin. The bobbin *P* has the circumferential groove or depressed portion *p* therein at the point where the end 2 of the

feeler *f'* engages with it (see Fig. 1) and also preferably the second circumferential groove or recessed portion *p'*, adjacent to the recessed portion *p*, forming a supplemental filling-reservoir.

It will be understood that when the bobbin *P* has the desired quantity of filling the end 4 of the feeler *f'* will be out of engagement with the actuating device *g*; but when the filling on the bobbin has been exhausted to a predetermined point the end 4 of the feeler *f'* will be in position to engage the actuating device *g* to operate the same and stop the loom, all as fully described in said Patent No. 609,257, to which reference is hereby made.

Referring now to my improved bobbin, it will be seen that in winding the filling on the bobbin a greater quantity of filling will be wound on the bobbin at the recessed portion *p* to make a greater thickness of the filling at this point, and also that the second recessed portion *p'* will contain filling after the first recessed portion *p* is exhausted, the winding of the bobbin beginning at its lower end, so that said recessed portion *p'* will be a supplemental reservoir to supply filling after the filling from the reservoir *p* is exhausted.

The filling in the reservoir *p* at each pick of the loom will be so reduced at the point where the end 2 of the feeler *f'* engages it that, as above stated, the feeler *f'* will be moved sufficiently to act effectively and engage with its end 4 the actuating device *g* at the proper time, and, further, the filling in the supplemental reservoir *p'* will after the exhaustion of the filling in the reservoir *p* and the operation of the feeler *f'* provide for a number of picks of the shuttle and prevent the bobbin being exhausted before it is changed on the other end of the loom in case shuttle or filling supplying mechanism is employed.

In Fig. 5 I have shown a modified form of my improvements. Instead of having the grooves or recessed portions *p* and *p'* in the bobbin, as shown in Fig. 4, the bobbin may be of ordinary shape and construction; but in winding the filling on the bobbin a greater amount of filling *s* is provided at the point *r*, where the end of the feeler presses, and also at the point *r'*. The result in the action of the feeler and the prevention of the exhaustion of the filling will be the same as above described in connection with the recessed portions *p* and *p'*.

Referring now to Fig. 3 of the drawings, my improvements shown in Figs. 1 and 2 may be combined with the parts shown in Fig. 3 to automatically operate the shuttle-supplying mechanism to supply a fresh shuttle on the opposite end of the loom instead of stopping the loom, as would be the case in an ordinary loom without a shuttle-supply mechanism.

I will now briefly describe the connection between the parts shown in Fig. 1 and the parts shown in Fig. 3 of the drawings to show how the operation of the actuating device *g*, Fig. 1, will through intervening mechanism



automatically operate the shuttle-supplying mechanism shown in Fig. 3 on the other end of the loom. The movement of the actuating device *g* at the proper time through intermediate connections, as fully described in Patent No. 609,257, above referred to, acts to raise the filling to a position where it cannot be engaged by the filling-fork, thereby leaving the filling-fork and its slide free for backward movement under the impact of the usual filling-hammer to turn the lever *c*<sup>10</sup>, connected with the rock-shaft *c*<sup>12</sup>, which extends across the front of the loom, and has fast on its other end, as shown in Figs. 3, the arm *c*<sup>13</sup>, to which is attached a rod *c*<sup>14</sup>, jointed to an elbow-lever *f*<sup>6</sup>, pivoted at 20 on the stand *B*<sup>x</sup>, one end of said lever *f*<sup>6</sup> entering a slot in the second elbow-lever *e*<sup>12</sup>, mounted on a stud *e*<sup>14</sup> and having at its lower end a roll or stud 26, which enters an annular groove in the sliding fork *f*<sup>31</sup>. The movement of the sliding fork *f*<sup>31</sup> moves the tooth 3 into position to be engaged by the teeth 24 of the gear *G*. The revolution of the gear *G* causes the rotation of the shaft *e*<sup>8</sup> and the disk *b*<sup>1</sup>, with which is connected, through link *e*<sup>5</sup>, the lever *e*<sup>3</sup>, having its fulcrum at *e*<sup>4</sup> on the loom side, said lever *e*<sup>3</sup> having connected to its other end a link *e*<sup>2</sup>, which at its lower end fits over a stud *b*<sup>3</sup>, extended laterally from the latter end of the shuttle-box rod *D*<sup>6</sup> or from a block 22, attached to the lower end of said rod by a screw 23 to raise the running shuttle-box. The movement of the lever *e*<sup>3</sup> through lever or bar *h*<sup>3</sup>, pivoted on a stud *h*<sup>4</sup> on the block 22, moves the shuttle-box *h* to bring the spare-shuttle box into operative position at the level of the race of the lay, so that the spare shuttle *h*<sup>2</sup> may be thrown across the lay, the running-shuttle box having been moved up out of position by the movement of the lever *e*<sup>3</sup>, all as fully described in said Patent No. 614,369.

I preferably have the shuttle-feeler mechanism on one end of the loom, as the right end, (shown in the drawings,) and the shuttle-changing mechanism on the opposite end

of the loom, as the left-hand end, (shown in the drawings,) in order not to have too much mechanism or too complicated mechanism on one end of the loom.

The advantages of my improvements will be readily understood by those skilled in the art.

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

1. In a loom of the class described, the combination of a feeler controlled as to its position by the quantity of filling on the bobbin, of a bobbin provided with a circumferential groove or recessed portion at the point where the feeler engages, substantially as shown and described.

2. A shuttle, and a bobbin carried therein, and provided with a circumferential groove at the point where the feeler engages therewith, in combination with a feeler having its end adapted to contact with the bobbin at said groove, and controlled as to its position by the quantity of filling in said groove, substantially as shown and described.

3. The combination with a shuttle, and a feeler pivoted therein, and controlled as to its position by the quantity of filling on the bobbin in said shuttle, of a bobbin provided with a circumferential groove or recessed portion at the point where the feeler engages, and a supplemental groove or recessed portion contiguous thereto, substantially as shown and described.

4. A shuttle-bobbin provided with the usual base and with two circumferential grooves or recessed portions, contiguous to each other, to form holders or reservoirs to contain a reserve supply of filling after the remainder of the yarn on the bobbin has become practically exhausted, substantially as shown and described.

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Witnesses:

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