

Jan. 2, 1923.

H. H. GOVE.
WEFT REPLENISHING LOOM.
FILED FEB. 23, 1918.

1,440,981

2 SHEET-SHEET 1

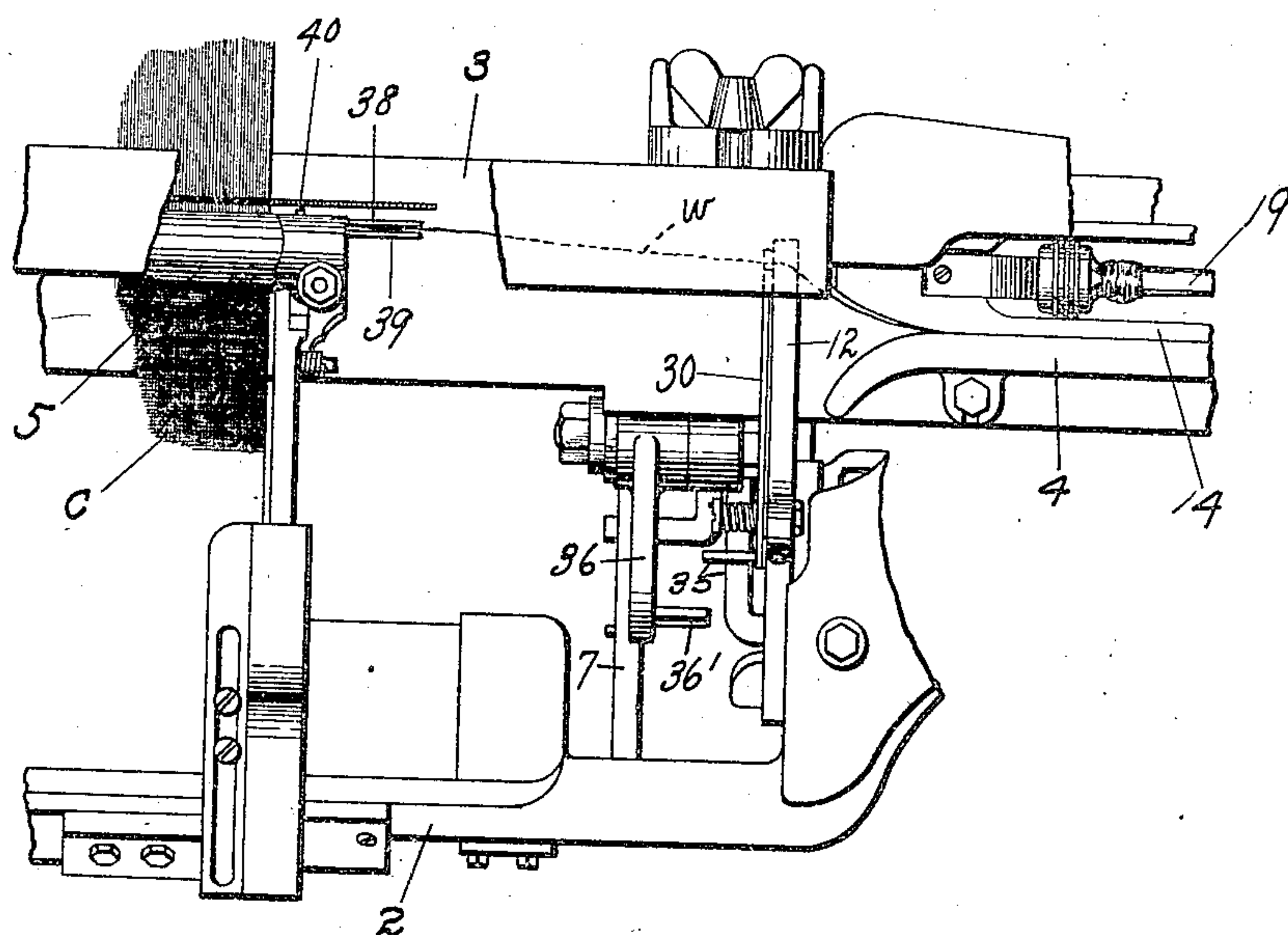


Fig 1

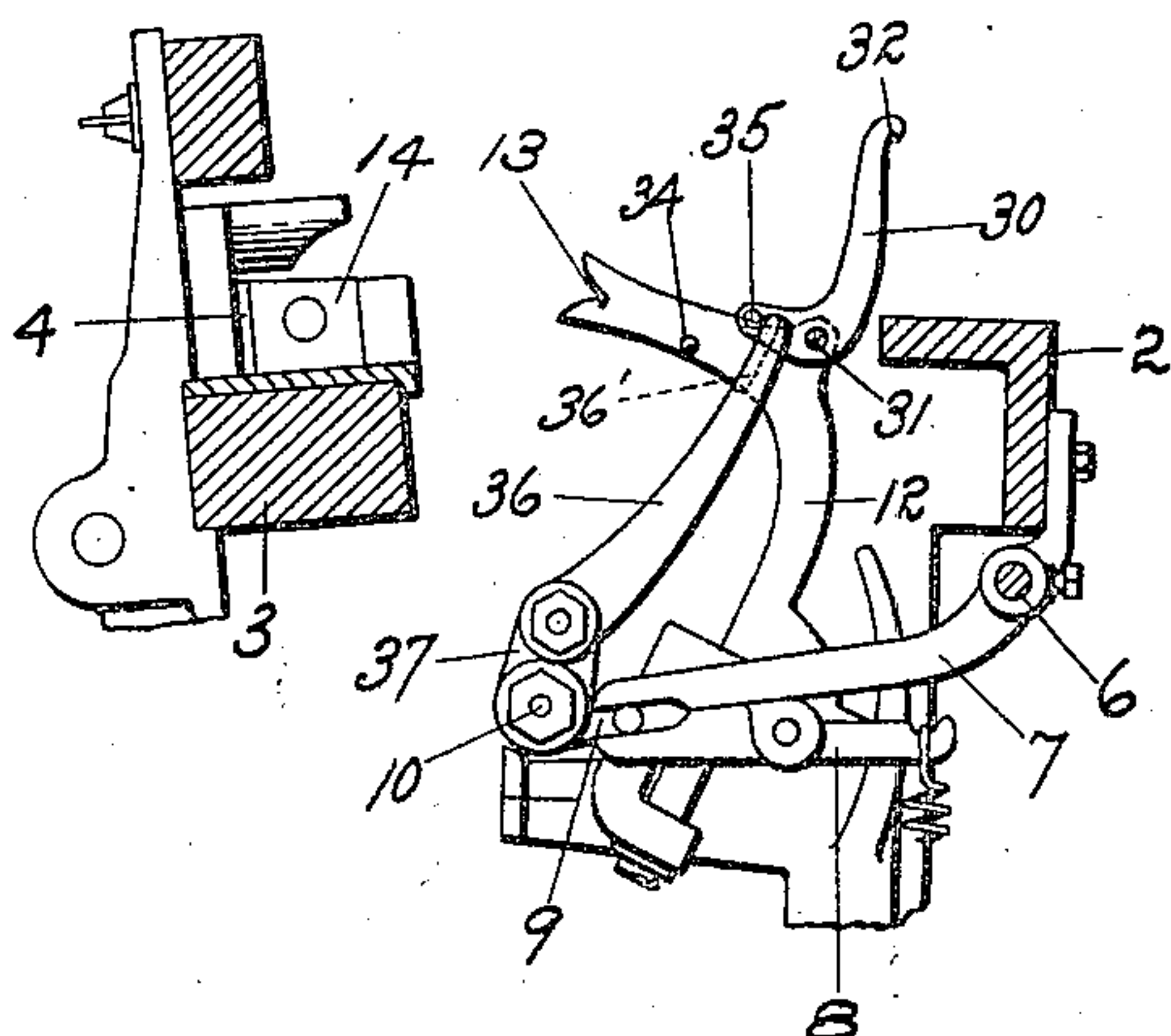


Fig 3

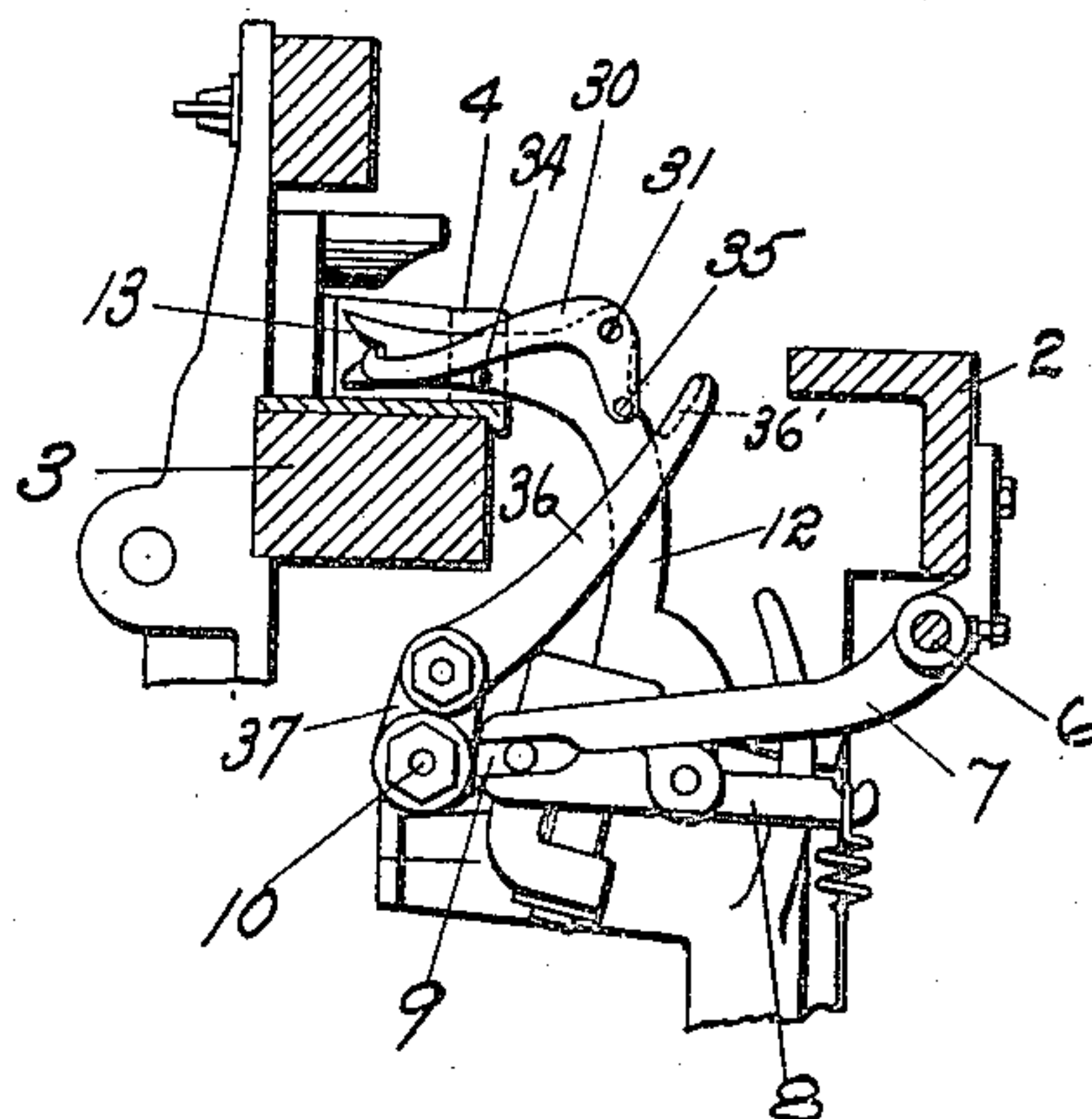


Fig 2

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By his Attorneys,
McGinnis & McCready.

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2 SHEET-SHEET 2

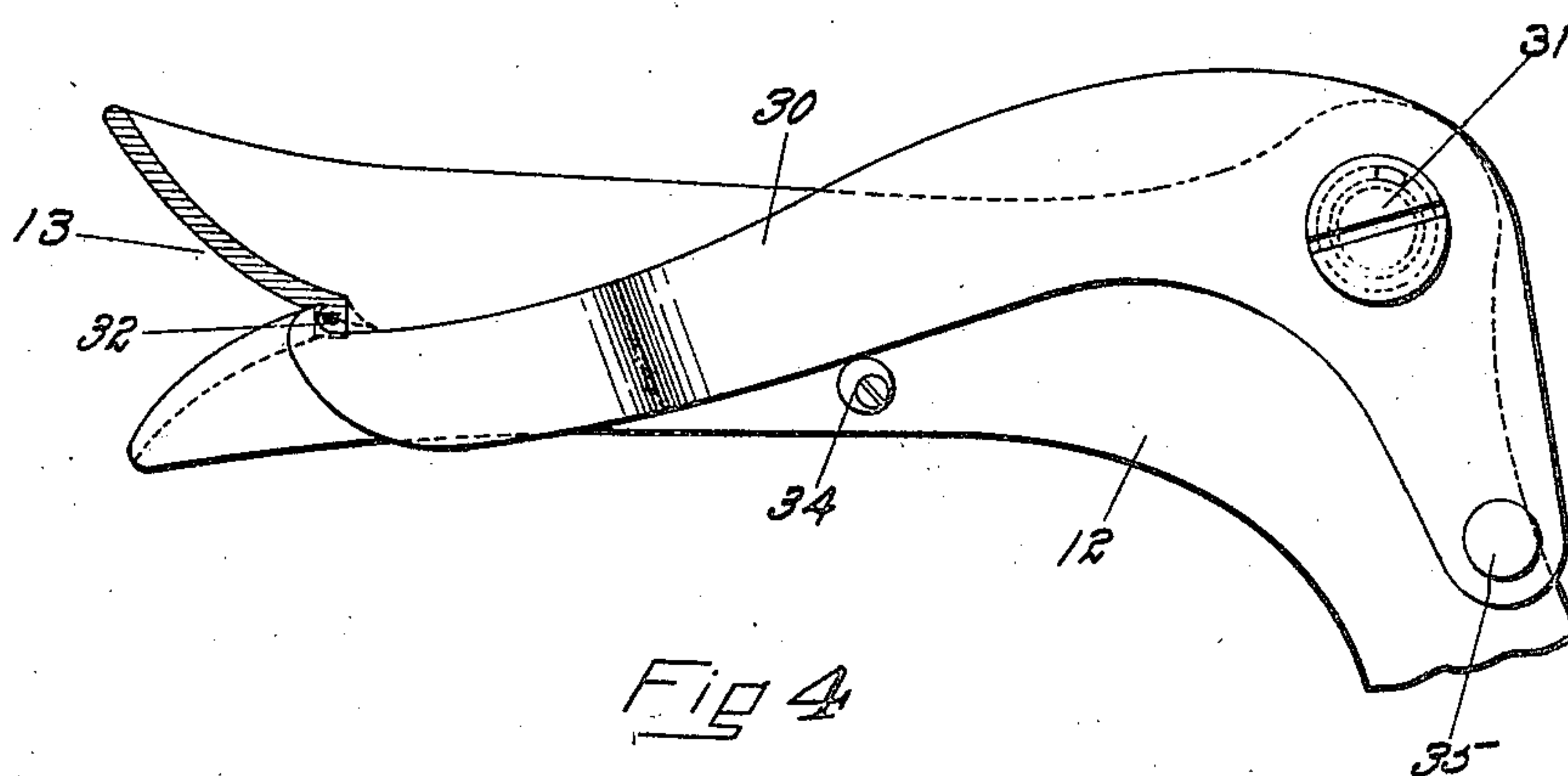


Fig 4

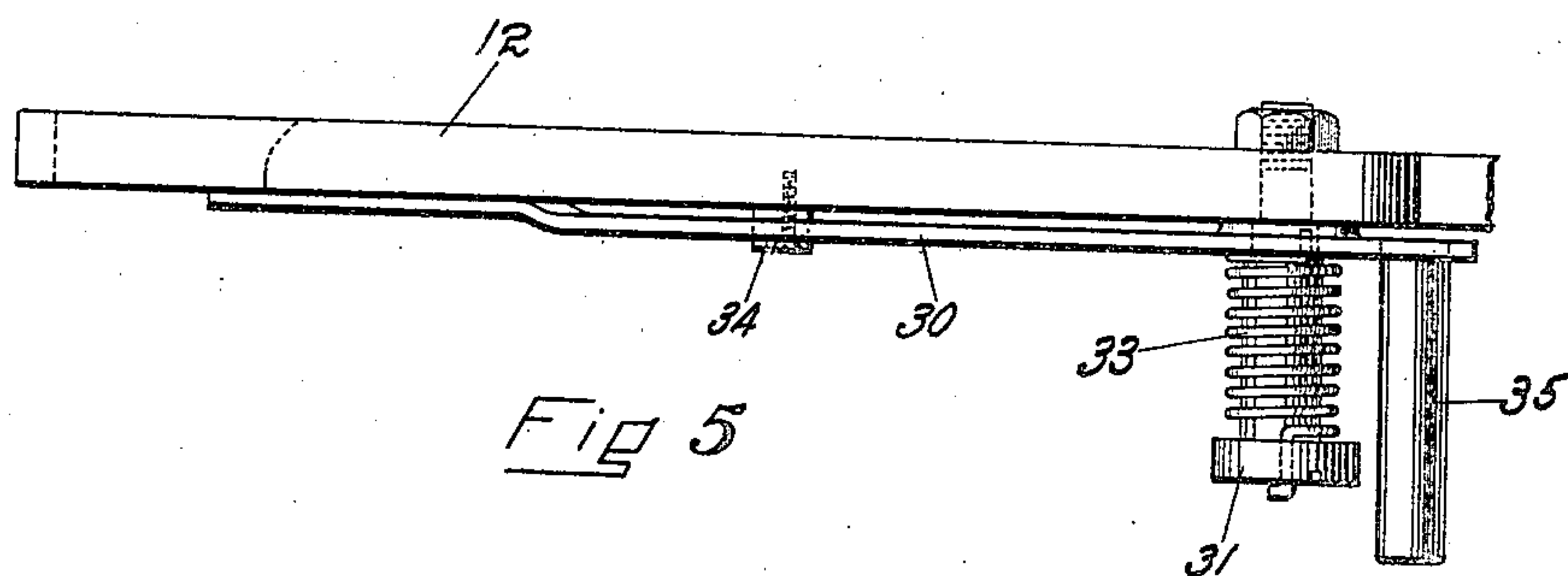


Fig 5

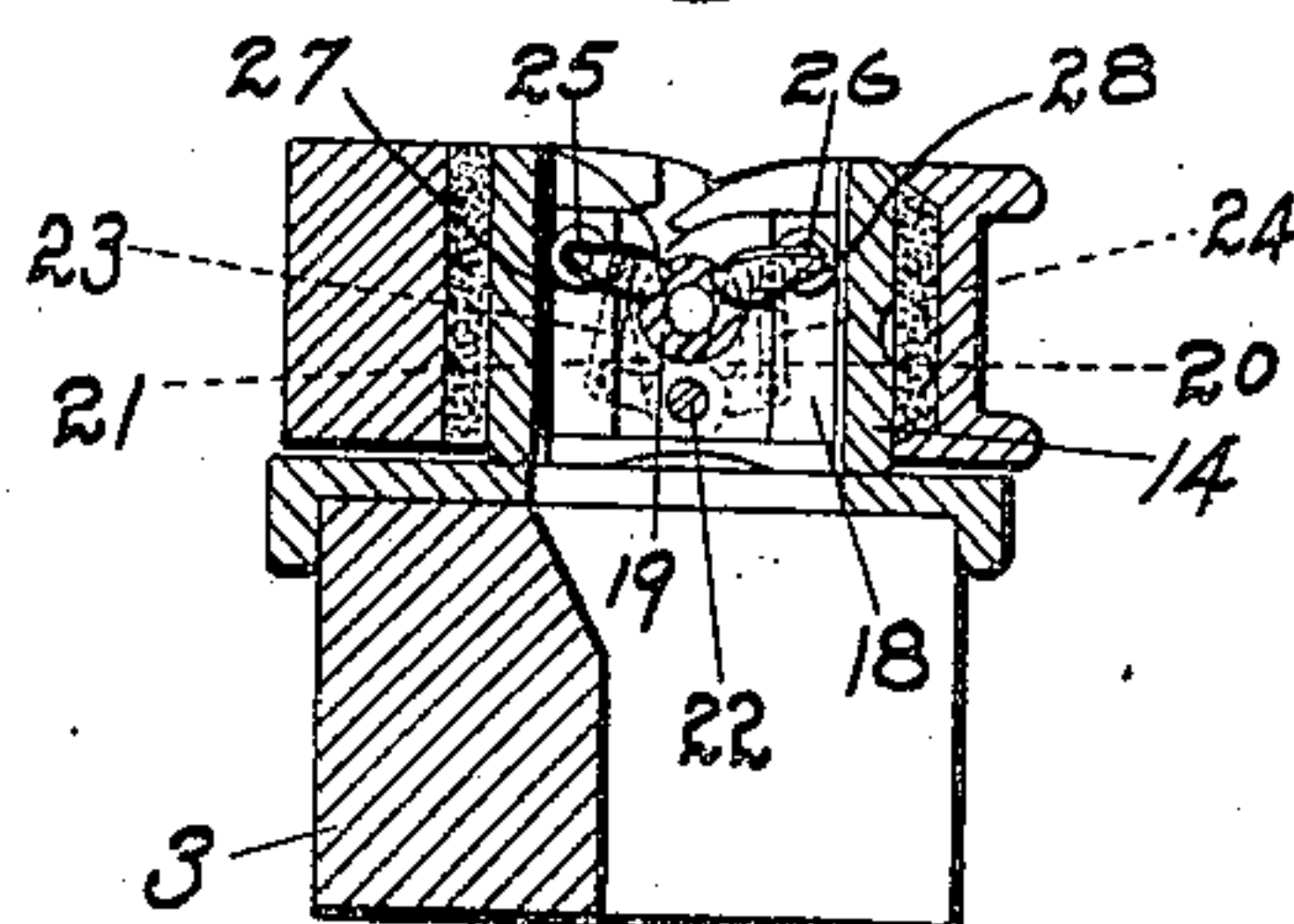
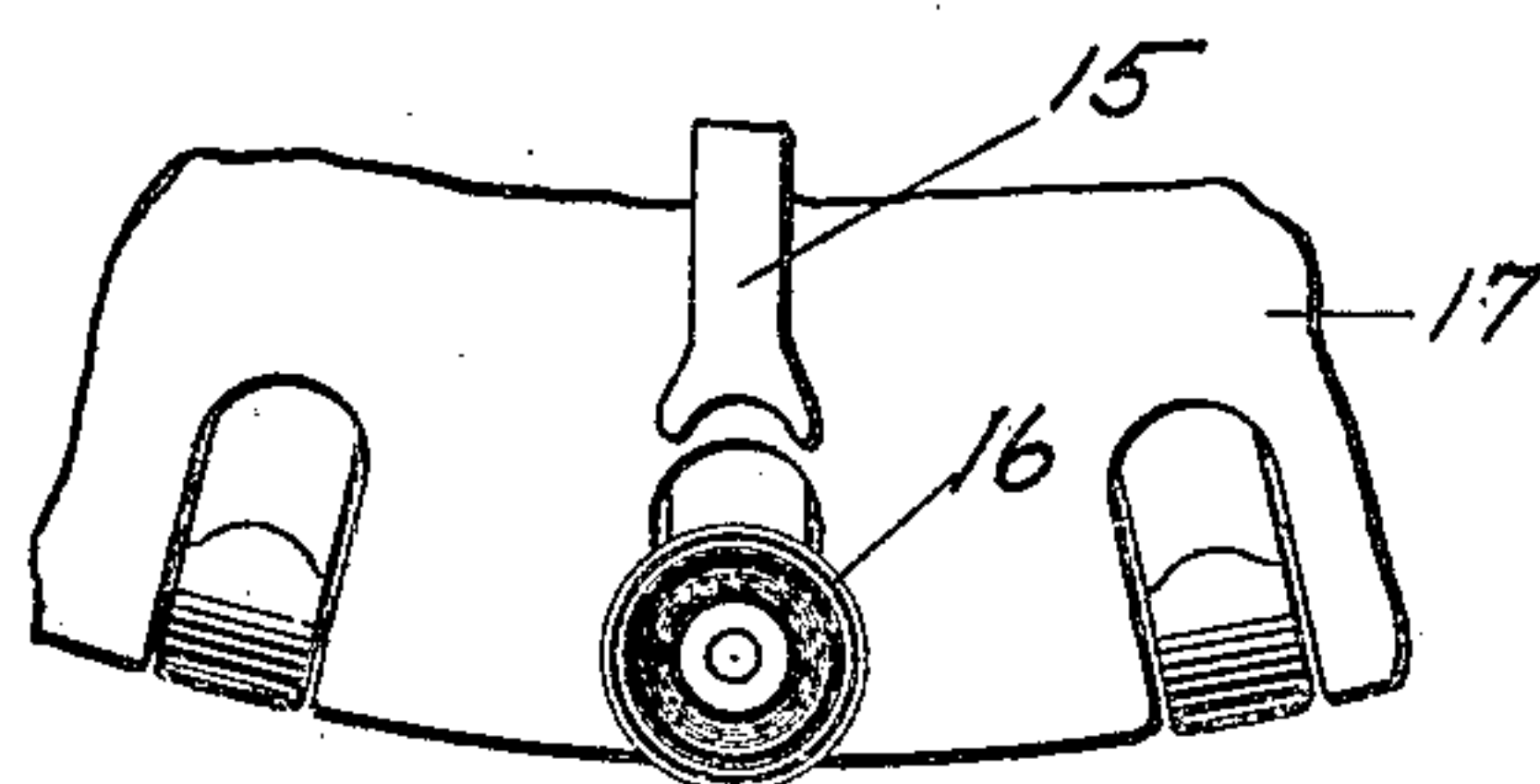


Fig 6

INVENTOR
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Patented Jan. 2, 1923.

1,440,981

UNITED STATES PATENT OFFICE.

HENRY H. GOVE, OF BIDDEFORD, MAINE, ASSIGNOR OF ONE-HALF TO HOWARD R. WHITEHEAD, OF SACO, MAINE.

WEFT-REPLENISHING LOOM.

Application filed February 23, 1918. Serial No. 218,614.

To all whom it may concern:

Be it known that I, HENRY H. GOVE, a citizen of the United States, residing at Biddeford, in the county of York and State of Maine, have invented certain Improvements in Weft-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to weft-replenishing looms of the type frequently referred to as "feeler looms" and exemplified by the well-known Northrop loom. Looms of this type comprise a hopper or holder for a series of full bobbins, a mechanism for effecting the transfer of a full bobbin from the hopper to the shuttle, and a feeler mechanism that controls this transferring mechanism. The arrangement is such that when the feeler mechanism detects the fact that the filling on the bobbin of the running shuttle is nearly exhausted it throws the transferring mechanism into operation and this mechanism inserts a full bobbin in the shuttle causing it to displace the substantially empty bobbin from the shuttle. When this bobbin transferring or weft-replenishing operation is performed it then becomes necessary to dispose of the section of weft thread that extends from the selvage of the goods to the ejected bobbin, since otherwise this thread may be carried back into the goods and produce a flaw in the cloth. This problem has proved exceedingly troublesome and has been the cause of very extensive experiments which have served to partially remedy the difficulty but have not resulted in producing satisfactory solutions for the problem.

The present invention is directed to the improvement of both the methods and the mechanisms now employed to dispose of this waste section of weft and it aims to satisfy the practical requirements presented by the conditions above described.

The manner in which it is proposed to accomplish these objects will be readily understood from the following description and the novel features of the invention will be pointed out more particularly in the appended claims.

Referring now to the accompanying drawings:

Figure 1 is a plan view of those parts of

an automatic loom to which reference is necessary for the purpose of describing the present invention and it shows the loom equipped with mechanism embodying the present invention;

Fig. 2 is a vertical, transverse, cross sectional view through the mechanism shown in Fig. 1;

Fig. 3 is a view similar to Fig. 2 but showing the parts in different positions;

Fig. 4 is a side view of a part of the mechanism shown in Figs. 1, 2 and 3, illustrating the parts on a larger scale;

Fig. 5 is a plan view of the parts shown in Fig. 4; and

Fig. 6 is a transverse cross sectional view through the shuttle box and the bobbin holder or hopper with which one type of automatic looms is equipped.

In the drawings 2 indicates the breast beam, 3 the lay equipped with the usual shuttle boxes, one of which is indicated at 4, and 5 the temple provided with the usual temple or selvage cutter. C designates the web of cloth being woven. The feeler mechanism (not shown) operates when the filling in the running shuttle is nearly exhausted to turn a rock shaft 6, mounted below the breast beam and extending parallel to it, and this motion is transmitted through an arm 7 and another arm 8, yieldingly associated therewith, to raise the arm 9 which is pivotally mounted on a stud 10. This arm constitutes a carrier for a shuttle feeler or protector 12 and the rocking of this arm moves the shuttle feeler 12 from its normal or retracted position, in which it is shown in Fig. 3, to its advanced position, as shown in Fig. 2. All of the mechanism so far described may be of any suitable or convenient form, the arrangement shown being substantially that disclosed in the Rhoades Patent No. 922,511, granted May 25, 1909.

The act of partially rotating the rock shaft 6 in addition to moving the feeler 12 in front of the shuttle 14, which at this time is in the shuttle box 4, and enabling it to confine a shuttle in the shuttle box, also initiates the bobbin transferring or weft-replenishing mechanism. This operation is effected by a transferrer or a hammer and fork 15, Fig. 6, which forces a full bobbin 16 out of the carrier or hopper 17 into the shuttle 14, and causes this bobbin to eject the substantially empty bobbin from the shuttle.

Since the mechanism required to perform this operation is well known to those skilled in this art and is in very common use in the trade, no detailed illustration or description of it is necessary here.

As above explained, the act of filling replenishment leaves a waste section of weft trailing behind the shuttle and extending to the selvage of the goods which must be disposed of. According to the present invention this result is effected by cutting the weft close to the ejected bobbin, preferably at a point within the shuttle, then withdrawing the trailing section of the filling or weft from the path of movement of the shuttle and severing this trailing piece of weft from the goods by parting it substantially at the selvage of the cloth.

Shuttle constructions have been proposed heretofore in which a cutting mechanism was employed to sever the filling between the bobbin and the eye of the shuttle and any suitable construction of this type may be employed in practising the present invention. I prefer, however, to make use of the shuttle cutter disclosed in my application filed of even date herewith. This construction is shown in a general way in Fig. 6, and comprises a plate 18 mounted in the shuttle between the tip of the bobbin 19 and the eye of the shuttle, this plate being provided with an aperture through which the weft is guided on its way to the shuttle eye. Two blades 20 and 21, constituting shears, are mounted on a pivot 22 located immediately below the thread guiding aperture above mentioned. Each of these blades 20 and 21 consists of a bell crank lever, and they are connected by links 23 and 24, respectively, to rock shafts 25 and 26, which are mounted in the plate 18 and terminate in wings 27 and 28, respectively. These wings project into the path of movement of the tip of the incoming bobbin, so that the act of forcing a full bobbin 16 into the shuttle to take the place of the empty bobbin actuates the shears and causes them to sever the filling very close to the tip of the bobbin.

This operation takes place substantially simultaneously with the ejection of the empty bobbin so that the use of this construction avoids the presence of any long filling end trailing behind the bobbin as it drops down through the shuttle box and out of the machine. Thus the trouble heretofore experienced with prior constructions in which the filling was severed at a point outside the shuttle and which resulted in leaving a long filling end trailing behind the bobbin which had to be pulled through the shuttle eye by the bobbin, is completely avoided. In other words, the fact of cutting the filling close to the bobbin avoids all possible cause for further trouble with the filling that remains attached to the bobbin.

The problem that remains after this operation is performed is to dispose of the waste section of weft that trails behind the shuttle, extending from a point within the shuttle to the selvage of the goods. It is obvious that unless this section of filling is removed from the path of movement of the shuttle, there is every probability that the next pick of the shuttle will whip a portion, at least, of this waste end into the shed and result in forming a highly objectionable flaw in the goods. According to the present invention, however, this danger is eliminated by pulling this section of filling out of the shuttle box and throwing it laterally away from the path of movement of the shuttle before the beat up of the next pick and then severing this piece of filling substantially at the selvage of the goods.

Referring particularly to Figs. 1, 2 and 3, it will be seen that the forward end of the feeler 12 is provided with a notch 13 so positioned that it straddles the filling when the feeler is moved into its forward or operative position. This notch is made so wide and flaring that there is no possibility of its missing the filling. A finger 30 is pivoted on the feeler 12 at 31 and is provided with a hook-shaped end having a notch 32, see Fig. 4, that can register with the end or apex of the notch 13. This finger can swing either into the position in which it is shown in Fig. 2, where it lies nearly parallel with the forward end of the feeler, or into a position substantially at right angles to said feeler, as shown in Fig. 3. At certain times, however, it is held in the former position by means of a spring 33 that is coiled about the pivot stud 31 and has one end secured in the head of this stud and its opposite end in a portion of the finger. The stud is clamped securely to the arm 12. A stop 34, consisting of a head eccentrically mounted for adjustment on a screw, limits the movement of the finger 30 under the influence of the spring 33. When the feeler is at the rearward limit of its stroke, the finger 30 is held in its backward position by the engagement of a stud 35, which projects from a tail piece with which the finger is provided, with the front face of a plate 36 secured to a stationary arm 36 which is adjustably clamped to a bracket 37.

When the rock shaft 6 is turned in a clockwise direction by the operation of the feeler mechanism, as above described, for the purpose of initiating the weft-replenishing operation and the shuttle feeler 12 is moved forward from the position in which it is shown in Fig. 3 to that in which it appears in Fig. 2, the finger 30 is swung downwardly by the spring 33 into a position in which its notch 32 lies beside the apex of the notch 13 in the feeler 12. During this movement the stud 35 swings away from the

arm 36 so that the finger is entirely within the control of the spring 33 except as its movement under the influence of this spring is limited by the stop 34. The lay is moved toward the breast beam immediately after the feeler is swung forward toward the lay and the shuttle at this time is in the right hand shuttle box in readiness for the bobbin-changing operation. The trailing weft thread, therefore, is held under some tension as it enters the notch in the forward end of the feeler 12, and this tension and the relative movements of the parts ensure the positioning of the weft in the notch 32 of the finger substantially as it is indicated at W in Fig. 4. The walls of the notch 13 are also laterally beveled to facilitate the proper positioning of the weft. At about the time that this engagement of the weft with the finger is effected, or shortly thereafter, the bobbin-changing operation takes place, which results, as above described, in cutting the weft at a point inside the shuttle. Consequently, when the rock shaft 6 turns backwardly in a counter-clockwise direction, thus causing the finger 30 to exert a pull on the thread, the entire section of weft between the shuttle and the finger is free to pull through the shuttle box and out of the path of movement of the shuttle. The connections between the feeler 12 and the finger 30 and the engagement of the stud 34 with the arm 36 operate to accelerate the movement of the finger 30 and snap it quickly back into its rearward position, as shown in Fig. 3. This motion whips the free end of the waste piece of weft out of the shuttle box and throws it over the breast beam. The opposite end of this piece of weft is still connected to the cloth but this action carries the entire length of this waste piece of material laterally out of the path of movement of the shuttle before the shuttle has an opportunity to pick it up and carry it into the shed. During the beating up of the next two or three picks the cutter 40 mounted in the temple and commonly designated as the "temple cutter" or "selvage cutter" is operated to sever this section of weft adjacent to the selvage of the cloth. This end of the waste piece of weft merely drops down in front of the lay entirely outside of the path of the weaving instrumentalities where it can do no harm whatever. These weft sections continue to rest on the beam until the attendant removes them and a very substantial accumulation of this material can collect without causing any annoyance or trouble. Two wires, or similar members, indicated, respectively, at 38 and 39 (Fig. 1), may be positioned in the temple, one above and one below the plane of the cloth, to

limit the range of movement of the end of the weft adjacent to the selvage when this thread is thrown rearwardly by the finger 30.

This mechanism has proved very reliable in practice and because of its simple construction and the fact that it is controlled and operated by the automatic weft-replenishing mechanism, will give satisfactory service for a long period without requiring repair or attention.

What is claimed as new, is:—

1. In an automatic weft replenishing loom, the combination of weft cutting means located adjacent to the selvage of the cloth, means for cutting the weft at the shuttle, a shuttle feeler operated by the weft replenishing mechanism, and a weft end removing device mounted to engage the weft at a point between the selvage and the shuttle, and arranged to be moved by said feeler in a path different from that of said feeler to remove the weft end from the path of movement of the shuttle.

2. In an automatic weft replenishing loom, the combination of weft cutting means located adjacent to the selvage of the cloth, means for cutting the weft at the shuttle, a shuttle feeler operated by the weft replenishing mechanism, and a weft end removing device arranged to engage the weft at a point between the selvage and the shuttle and mounted on said feeler to be moved thereby in a different path from that of the feeler.

3. In an automatic weft replenishing loom, the combination of weft cutting means located adjacent to the selvage of the cloth, means for cutting the weft at the shuttle, a shuttle feeler having its forward end shaped to engage the weft, a weft engaging finger mounted on said feeler and having a part cooperating with the forward end of said feeler to catch the weft, and means cooperating with said feeler to give said finger a quick movement to cause it to throw the weft laterally away from the path of movement of the shuttle.

4. In an automatic weft replenishing loom, the combination of weft cutting means located adjacent to the selvage of the cloth, means for cutting the weft at the shuttle, a shuttle feeler having its forward end notched to engage the weft at a point between said cutting means, a weft engaging finger pivoted on said feeler, a spring acting on said finger to move it in one direction, and a part arranged to engage said feeler to move it in the opposite direction.

In testimony whereof I have signed my name to this specification.

HENRY H. GOVE.

Certificate of Correction.

It is hereby certified that Letters Patent No. 1,440,981, granted January 2, 1923, upon the application of Henry H. Gove, of Biddeford, Maine, for an improvement in "Weft-Replenishing Looms," were erroneously issued to the inventor, said Gove, and Howard R. Whitehead, as assignee of one-half interest in said invention, whereas said Letters Patent should have been issued to *Charlotte M. Gove, administratrix of said Henry H. Gove, deceased, and Howard R. Whitehead, of Saco, Maine*, as assignee of *one-half* interest in said invention, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 13th day of February, A. D., 1923.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.