

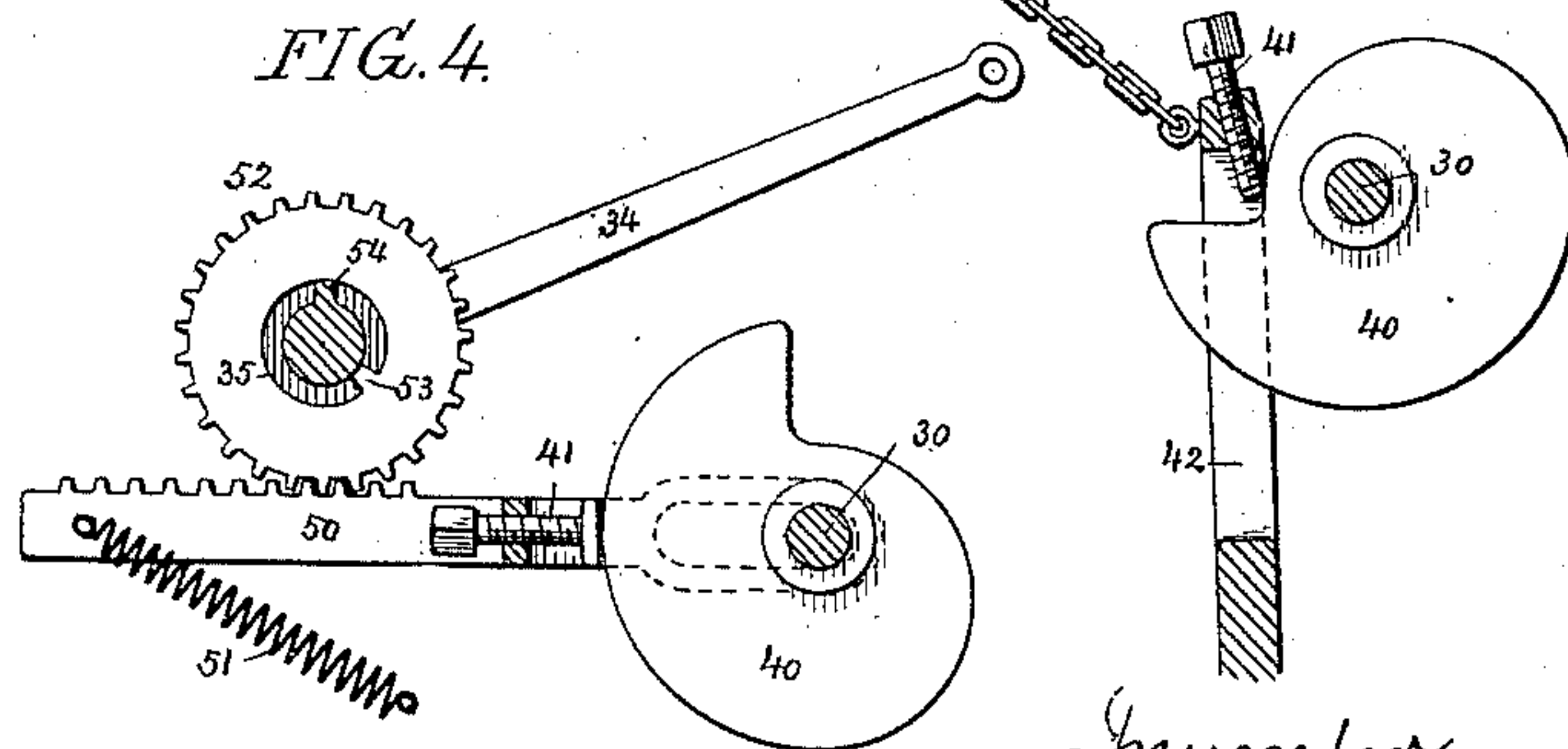
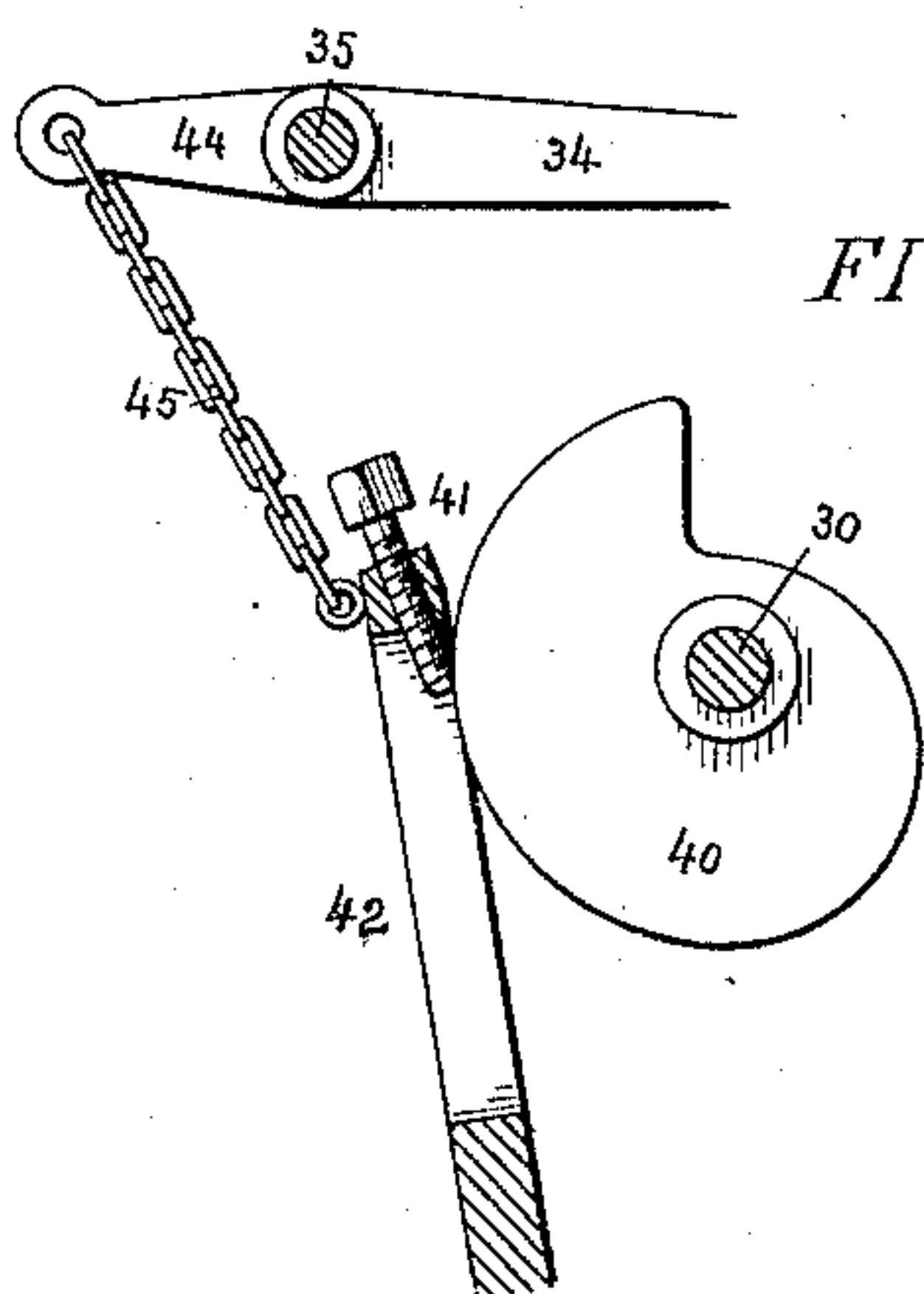
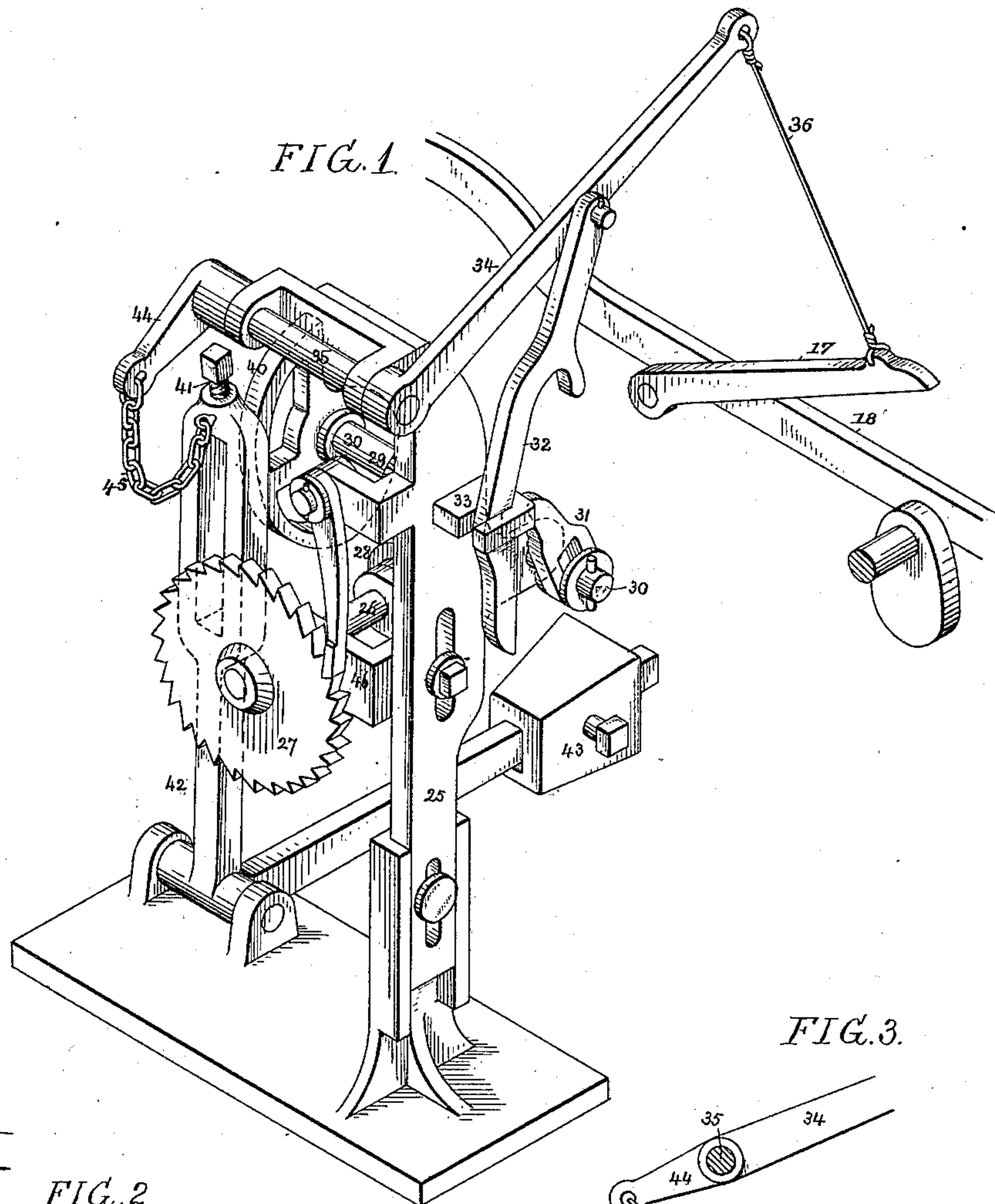
(No Model.)

F. HEBDEN.

SHUTTLE BOX PATTERN MECHANISM FOR LOOMS FOR WEAVING
FABRICS HAVING END BORDERS.

No. 401,702.

Patented Apr. 16, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK HEBDEN, OF PHILADELPHIA, PENNSYLVANIA.

SHUTTLE-BOX-PATTERN MECHANISM FOR LOOMS FOR WEAVING FABRICS HAVING END BORDERS.

SPECIFICATION forming part of Letters Patent No. 401,702, dated April 16, 1889.

Application filed January 24, 1889. Serial No. 297,391. (No model.)

To all whom it may concern:

Be it known that I, FRANK HEBDEN, a subject of the Queen of Great Britain and Ireland, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Shuttle-Box-Pattern Mechanism for Looms for Weaving Fabrics Having End Borders, of which the following is a specification.

My invention consists of an improvement in or addition to the attachment for looms forming the subject of my Letters Patent dated March 12, 1889, No. 399,613, the object of my present improvement being to provide for the automatic throwing of the attachment out of as well as into action, so that no attention on the part of the loom-operative is required for the performance of either of these duties.

In the accompanying drawings, Figure 1 is a perspective view of the attachment with the improvement thereon. Figs. 2 and 3 are detail views showing the same parts in different positions, and Fig. 4 is a view illustrating a modification of the invention.

The attachment forming the subject of my above-entitled application may be described briefly as a device for causing the movement into and out of operative position of an arm on the rod which actuates the pattern-chain of the drop-box mechanism, the device comprising, essentially, a lever connected to said arm on the chain-operating rod, a retainer carried by said lever and engaging with a fixed stud, a toe or tripper for striking said retainer and throwing it out of engagement with the stud, and gearing whereby the shaft of said toe or tripper was actuated from some moving part of the loom. As shown, however, the attachment simply effected the release of the retainer, the lever connected to the arm on the chain-operating rod being lifted by hand by the loom-operative in order to reset the attachment after a proper length of fabric had been woven with the drop-boxes, as in forming a border upon a towel or other piece of fabric.

So far as regards the mechanism for tripping the retainer it is the same in the improved attachment as in that previously devised, a suitable standard, 25, carrying a bearing, 46, for a short shaft, 26, which has at one end a ratchet-wheel, 27, to be operated by a pawl on the lathe of the loom or in any

other convenient way, the opposite end of the shaft 26 having a worm, 28, which gears into a worm-wheel, 29, on a shaft, 30, having at its outer end a toe, 31, for striking a retainer, 32, which is notched for engagement with a fixed stud, 33, on the standard, and is hung to a lever, 34, secured to a rock-shaft, 35, on the frame, the outer end of said lever 34 being connected by a cord or wire, 36, to the arm 17 of the chain-operating rod or bar 18. When the retainer is in engagement with the stud 33, this arm 17 is elevated or out of the path of its operating-cam; but when the retainer is released from the control of the stud on being struck by the toe 31 the arm 17 is permitted to fall into range of the cam and the drop-box-chain-operating rod is actuated thereby, as set forth in my former patent, before alluded to. In order, however, to overcome the necessity of lifting the lever 34 by hand in order to reset the retainer, I now provide the shaft 30 with a cam, 40, which engages with a set-screw, 41, carried by the slotted arm of a bell-crank lever, 42, the other arm of which has a counterbalance-weight, 43, the latter being preferred to a spring, because of its greater certainty and uniformity of action. The upper end of the slotted arm of the lever 42 is connected to an arm, 44, on the rock-shaft 35 by a chain, cord, or other flexible connection, 45. When the toe 31 acts upon the retainer 32, the cam 40 has moved back the vertical arm of the lever 42, the connection between the same and the arm 44 of the rock-shaft 35 hanging loose, as shown in Fig. 1. When the retainer is released and the lever 34 drops, however, the movement imparted to the arm 44 is sufficient to tighten this connection, as shown in Fig. 2, and the parts remain in this position with the drop-box in operation until the desired length of fabric has been woven with the use of the drop-boxes. By this time the cam 40 has been moved to such a position that it releases the lever 42, the counterbalance-weight on which causes the upper end of the vertical arm to swing forward, as shown in Fig. 3, thus through the medium of its connection with the arm 44 operating the latter and the rock-shaft 35, so as to lift the lever 34, in order to again raise the arm on the chain-operating rod out of operative position and cause the re-

tainer 32 to again engage with the stud 33, thereby holding the lever 34 in elevated position until such time as the retainer has been again tripped by the toe 31.

5 It will thus be seen that the device is perfectly automatic in its operation, both in regard to the tripping of the retainer to lower the arm of the drop-box-chain-operating rod into operative position and for relifting said
10 arm and resetting the retainer to hold it out of operative position, no attention on the part of the loom-operative being required in order to insure the proper action of the attachment. The set-screw 41, carried by the
15 lever 42, provides for the accurate setting of the device, so that said lever will be released by the cam when a certain number of picks have been produced.

20 Although the weighted lever connected to an arm on the rock-shaft 35 is preferred, other means of operating said rock-shaft under control of the cam 40 may be used without departing from my invention. For instance, in Fig. 4 I have shown a rack, 50, moved in one
25 direction by the cam and in the other direction by a spring, 51, this rack engaging with a pinion, 52, turning on the shaft 35, and having a pin, 53, for engaging with a pin, 54, on said shaft, so that the necessary lost motion
30 of one in respect to the other is permitted.

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

35 1. The combination of the drop-box-chain-operating rod and its arm, a retainer for holding said arm out of operative position, a tripper for said retainer, a weighted lever or

equivalent resetting device for said retainer, a connection between the resetting device and the retainer, a cam for governing the action of said resetting device, and means for
40 operating the tripper and cam, substantially as specified.

2. The combination of the drop-box-chain-operating rod and its arm movable into and out of operative position, a rock-shaft having
45 a lever connected to said arm and provided with a retainer for holding the arm in inoperative position, a tripper for said retainer, a weighted lever connected to an arm on the rock-shaft, a cam for acting on said weighted
50 lever, and means for operating the tripper and cam, substantially as specified.

3. The combination of the drop-box-chain-operating rod and its arm movable into and out of operative position, a retainer for hold-
55 ing said arm in inoperative position, a tripper for said retainer, a weighted lever or equivalent device for resetting the retainer after it has been tripped, a connection between the resetting device and the retainer,
60 a cam for governing the operation of said resetting device, a set-screw on the resetting device for engaging with said governing-cam, and means for actuating the tripper and cam,
65 substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK HEBDEN.

Witnesses:

WILLIAM D. CONNER,
HARRY SMITH.