No. 685,746. Patented Nov. 5, 1901.

J. CWERKA.

STOP MOTION FOR LOOMS.

(Application filed June 10, 1901.)

(No Model.) 3 Sheets—Sheet 1.

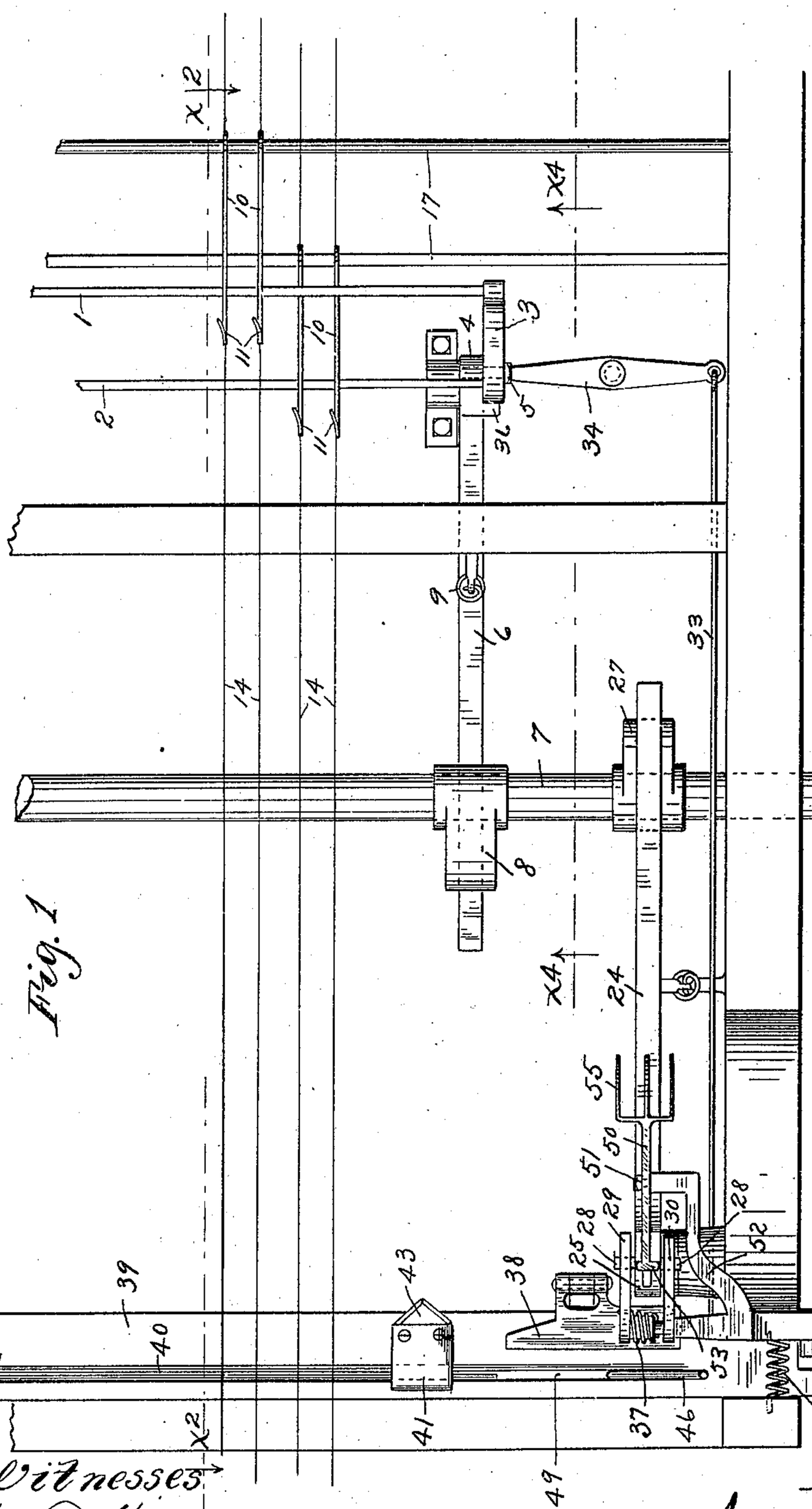

Fig. 1

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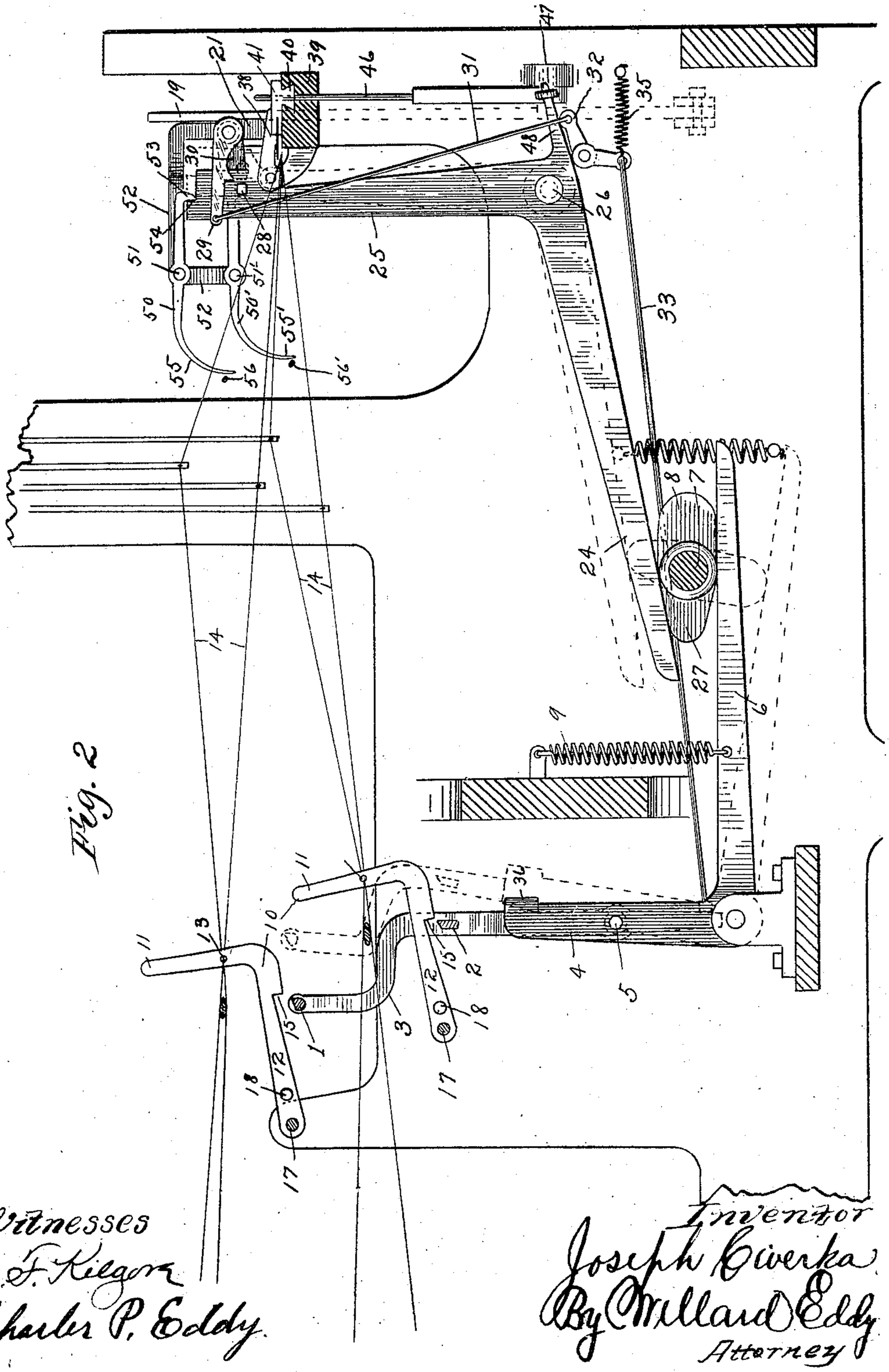

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 3

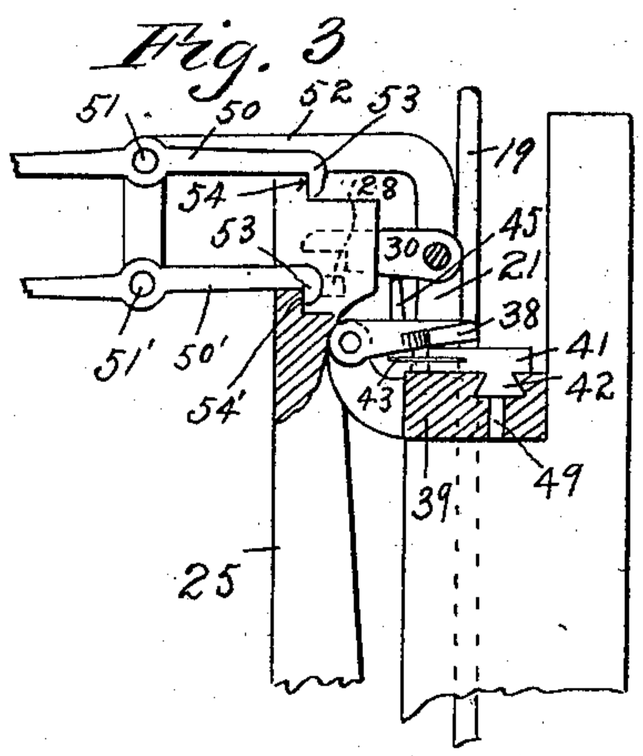


Fig. 4

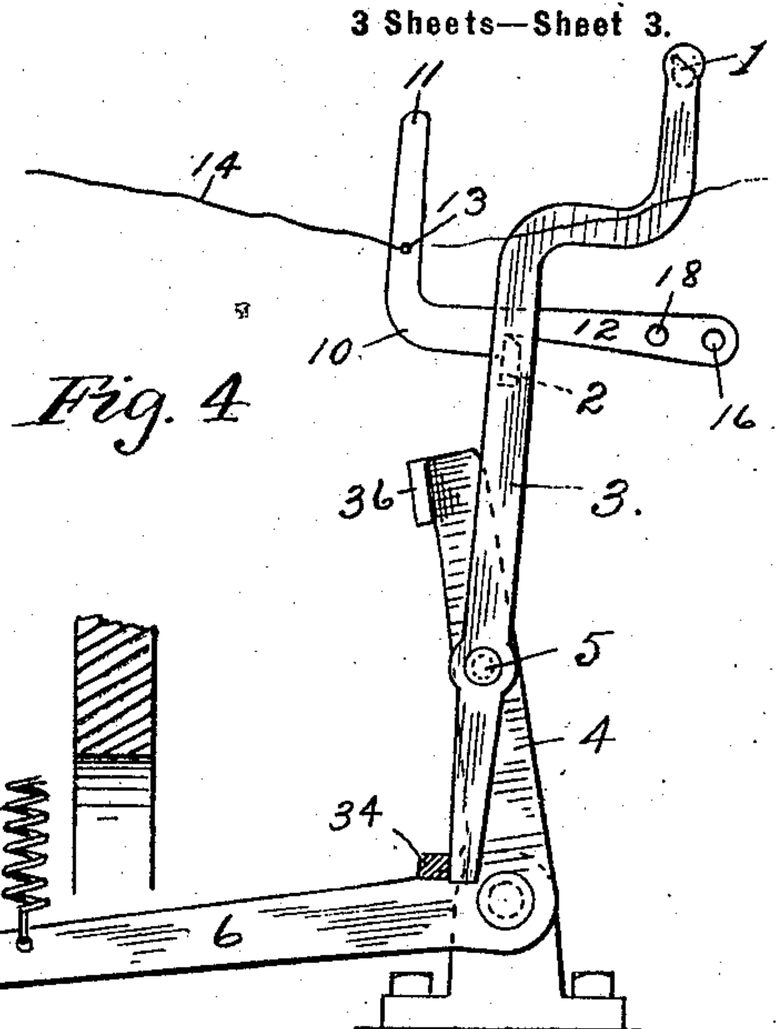


Fig. 5

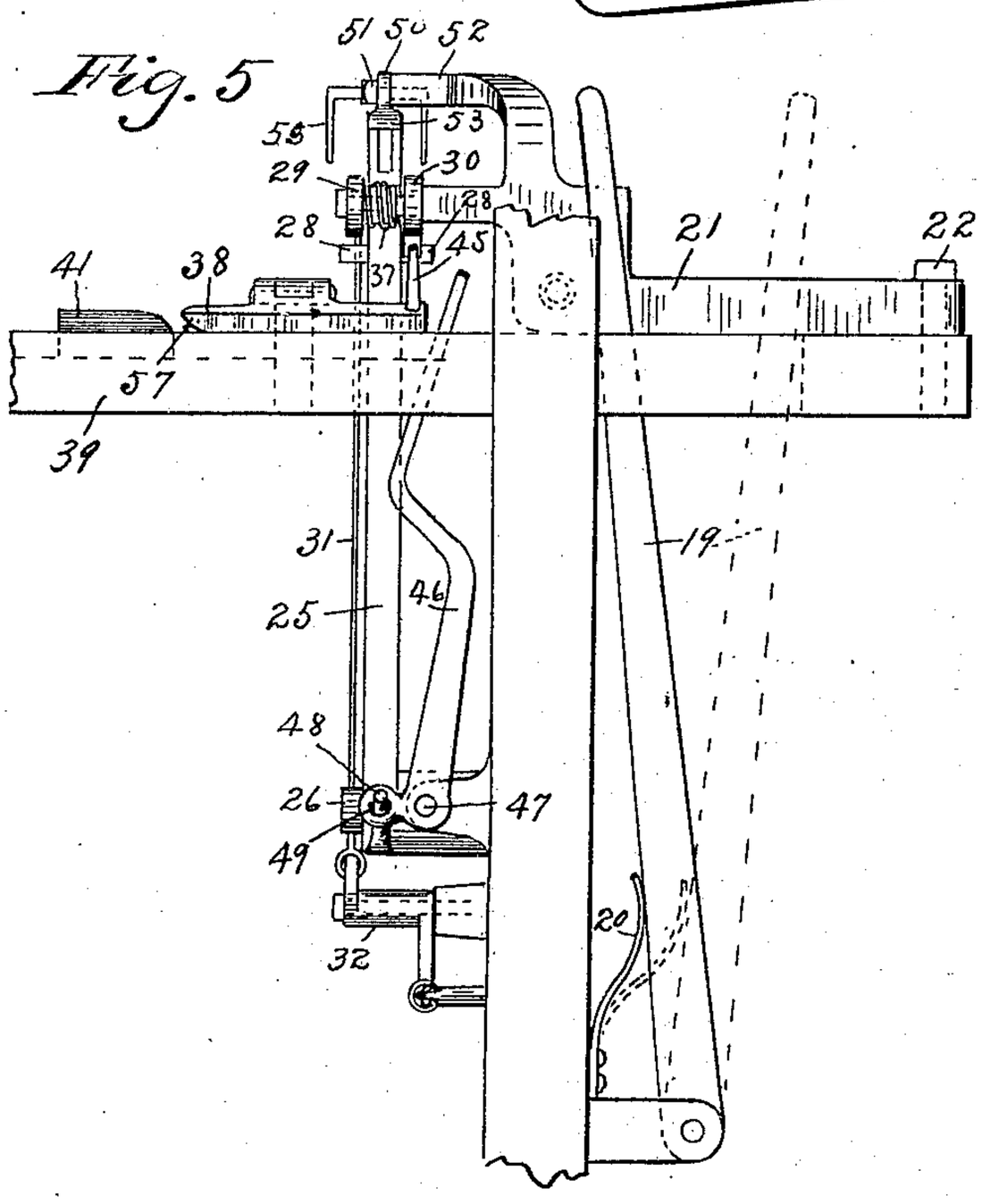
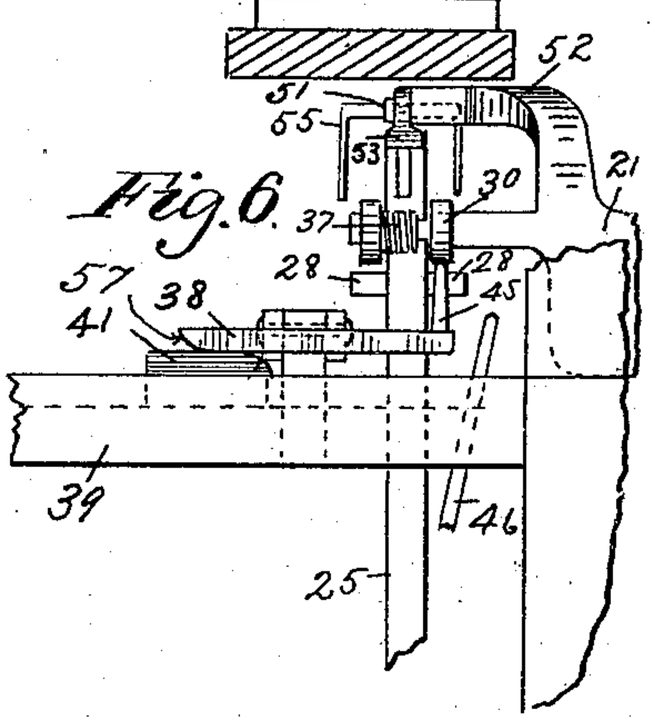


Fig. 6



Witnesses
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UNITED STATES PATENT OFFICE.

JOSEPH CWERKA, OF MANCHESTER, CONNECTICUT.

STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 685,746, dated November 5, 1901.

Application filed June 10, 1901. Serial No. 63,873. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH CWERKA, of Manchester, Hartford county, Connecticut, have invented certain new and useful Improvements in Stop-Motions for Looms, which improvements are described in the following specification and are illustrated by the accompanying drawings.

My invention relates not only to warp stop-motions and to "filling stop-motions," so called, but also to knife stop-motions—that is to say, to stop mechanism which is applicable to looms used for weaving piled fabrics and is brought into operation by the breakage or inaction of the knife characterizing looms of that class.

The invention consists in a new and improved warp stop-motion, a new and improved knife stop-motion, and a new and peculiar manner of combining different kinds of stop-motions in a single loom.

My warp stop-motion, separately regarded, is of the well-known type wherein the breakage or undue slackness of a warp-thread operates to stop the loom by bringing a normally warp-engaging detector into engagement with a normally vibrating feeler. My knife stop-motion comprises a detector which is normally actuated by the knife in an intermittent manner and a continually-vibrating feeler which is rendered operative by such detector to stop the loom whenever the knife fails to act. My filling stop-motion is of the kind commonly designated as the "fork-and-grid stop-motion" or of any other convenient kind operating upon the same principles. These several stop-motions are rendered efficient through a single continually-vibrating member which operates to stop the loom whenever necessary.

The best manner in which I have contemplated applying the principles of my invention is illustrated in said accompanying drawings.

Figure 1 is a plan of part of a loom which embodies my invention and is adapted for the weaving of piled fabrics. Fig. 2 is a longitudinal vertical section of part of the same loom on the broken line X^2 X^2 of Fig. 1. Fig. 3 is an enlarged detail from Fig. 2 with parts removed to show construction. Fig. 4 is a detail, being a section on the broken line X^4 X^4 of Fig. 1. Fig. 5 is a front elevation of a portion of the same loom in detail. Fig. 6 is a repetition of a portion of Fig. 5 with parts in positions changed to show operation.

My warp stop-motion being of the type aforesaid requires description in respect of its feeler and detectors. The feeler consists of the parallel rods 1 and 2, which are partly shown in Figs. 1 and 2 and are indicated in Fig. 4. These rods are united as parts of a rigid frame by means of duplicate terminal frame-pieces 3, whereof but one is shown, and are mounted thereby upon duplicate standards 4 by means of duplicate pivots 5. Vibratory motion is continually imparted to each standard 4 by a lever-arm 6, which is driven by cam 8 on a shaft 7 and is held up to that cam by spring 9. Normally this vibratory motion is continually communicated to the feelers. The detectors 10, adapted to cooperate with the feeler-rods as occasion may require, are thin plates of metal or other rigid material of the general form shown in Figs. 1, 2, and 4. More particularly each detector consists of two arms 11 and 12, uniting with each other at an angle and perforated, respectively, by an eye 13 for the accommodation of the supporting warp-threads 14 and by a terminal eye 16 for the accommodation of a normally supporting stationary rod 17. The upper arm 11 reaches upward above said eye 13 for convenience of manipulation by the operator, and the lower arm 12 has in its lower edge a notch 15 for occasional engagement with the subjacent feeler-rod and is perforated by an additional eye 18 for the accommodation of an additional rod, (not shown in the drawings,) whereon the detectors of the upper or of the lower series may be threaded by the hand of the operator and held in place whenever rod 17 is temporarily withdrawn for the purpose of permitting the removal of any broken or defective detector and the substitution of a new one in its place. Arm 11 is slightly bent or twisted from the plane of arm 12 to permit the ready passage of the warp-thread, as shown in Fig. 1.

The mechanism proximately employed for stopping the loom is an ordinary shipper-handle 19, actuated by a spring 20 and operated in the usual manner by a knock-off lever 21, whose fulcrum is pivot 22, as shown in

Figs. 1, 2, and 5. While the loom is working this lever is normally retained in its dilineated position by a spring 23, which is shown in Fig. 1; but for the purpose of stopping the loom by knocking the shipper-lever 19 off the shoulder 44 may be pushed away from that position by means of mechanism which remains to be described.

A bent lever consisting of arms 24 and 25, as shown in Fig. 2, is mounted upon the stationary pivot 26 and is continually vibrated by cam 27 on said shaft 7. By means of a cross-pin 28, which is set through the upper part of the vibrating arm 25, and by means of pawls 29 and 30, which are carried by the knock-off lever 21, said arm 24 and lever 21 are adapted to engage each other as occasion may require. Pawl 29, which is normally held off from stop 28 by spring 37, is connected with frame-piece 3 by means of a cord 31, which is attached to said pawl, a bell-crank 32, which is attached to said cord, a rod 33, which is attached to said bell-crank, and a pivoted lever 34, which is attached to said rod and immediately engages said frame-piece 3 below said pivot 5. By the action of spring 35 on bell-crank 32 said frame-piece 3 is normally held in contact with a stop 36 on standard 4 and in a position of general verticality, as shown in Fig. 2.

My knife stop-motion includes a portion of the mechanism already described, together with a knife-detector and coöperating mechanism, which remain to be described. The knife-bar 39, the dovetailed channel therein 40, the knife-carrier 41, riding upon the knife-bar and having its foot 42 within said channel, the reciprocating knife 43, fastened to said carrier, and the unexhibited means of driving the knife-carrier are all of familiar types. The knife-detector 38 is a light metallic plate which has a beveled edge 57, is hinged to the knife-bar 39, and is provided with an up-reaching finger 45, engaging said pawl 30. This detector being placed across the path of the knife-carrier 41 lies flat upon the knife-bar during every excursionary absence of that carrier, as in Figs. 1, 2, and 5, but is with equal frequency raised from that position by the carrier 41 when the knife passes under, as in Figs. 3 and 6.

A quick-moving lever-arm 46, pivoted at 47 and actuated from a finger 48 on the elbow of lever 24 and 25, extends through a slot 49 in said bar 39, as shown in Figs. 1, 2, 5, and 6, delivers a blow along by the free edge of the knife-detector 38 at every complete excursion of the knife, and is thereby adapted to knock away the latter in case it should accidentally stop under said detector.

A filling stop-motion of the specified kind is applied to the loom in the following manner. A filling-detector in the form of an ordinary weft-fork 50 is mounted by pivot 51 upon an arm 52 of the knock-off lever 21, as shown in Fig. 1, and is adapted by catch 53 to engage with catch 54 of the vibrating arm 25 whenever the fork-tines 55 miss contact with the weft-thread 56, and in the same manner a duplicate fork 50′, having a pivot 51′, a catch 53′, and tines 55′, is adapted to engage catch 54′ of said arm 25 upon any failure of the weft-thread 56′ in the weaving of double-backed fabrics.

The mode of operation of the combined stop-motions requires additional description. They become severally operative to stop the loom by causing motion to be communicated from the continually-oscillating lever-arm 25 to the knock-off lever 21. This result is produced through the warp stop-motion in the following manner: Whenever a detector 10, dropping from its normal position, (shown in Fig. 2,) engages the subjacent feeler-rod 1 or 2, as shown in Fig. 4, that feeler-rod is stopped, and as the standards 4 continue to vibrate the frame-piece 3, turning upon its pivot 5 and acting through lever 34, rod 33, bell-crank 32, and cord 31, draws pawl 29 from its normal position (shown in Fig. 2) down into the path of stop 28, which forthwith engages that pawl, and thereby communicates motion from arm 25 to lever 21. The same result is produced through the knife stop-motion in the following manner: So long as the knife 43 continues to reciprocate the knife-detector 38 is intermittently raised from its depressed position (shown in Fig. 5) to its elevated position, (shown in Fig. 6,) and thereby pawl 30, being similarly raised by finger 45, clears catch 28 as often as arm 25 approaches; but whenever the knife fails to work said pawl and stop engage each other and arm 25 communicates a push to lever 21. The same result is produced through the weft stop-motion in a similar manner, for whenever either of the weft-forks misses its warp-thread that fork engages arm 25 by catches 53 and 54 and a motion of said arm is communicated to the knock-off lever through lever-arm 52, to which the fork is pivoted.

Such being the construction and operation of my invention, I claim—

1. In a loom for weaving piled fabric, a normally oscillating knife, and a normally vibrating knife-detector, in combination with mechanism for stopping the loom, and mechanism whereby such loom-stopping mechanism is brought into operation by the stoppage of the knife-detector.

2. In a loom for weaving piled fabric, mechanism for stopping the loom, and a vibrating member, which is adapted to operate such loom-stopping mechanism, in combination with an oscillating knife, and a knife-detector, which is adapted to control the mutual engagement of the loom-stopping mechanism and vibrating member.

3. In a loom for weaving piled fabric, a reciprocating knife-carrier, and a knife-detector, mounted in the path of said carrier, and movable thereby, in combination with a knock-off lever, a reciprocating member, which is adapted to operate said lever, and

intermediate mechanism, which is controlled by said knife-detector, and is adapted to produce an engagement between said lever and said reciprocating member.

4. In a loom for weaving piled fabric, a reciprocating knife and knife-carrier, a knife-detector, which is adapted to be moved intermittently by said knife-carrier, and loom-stopping mechanism, which is normally controlled by said knife-detector, in combination with a vibrating lever, which is adapted to knock away the knife, whenever it lingers by the knife-detector.

5. In a loom for weaving piled fabric, loom-stopping mechanism, in combination with a warp stop-motion, a weft stop-motion and a knife stop-motion, which are severally adapted to bring said loom-stopping mechanism into operation.

6. In a loom for weaving piled fabric, loom-stopping mechanism, a continually-vibrating member, which is adapted to operate said loom-stopping mechanism, in combination with a series of warp-detectors, two filling-detectors and a knife-detector, which are severally adapted to bring said loom-stopping mechanism and said vibrating member into operative engagement.

7. In a loom for weaving piled fabric, an oscillating knife, and mechanism for stopping the loom, in combination with means for bringing such loom-stopping mechanism into operation, upon the stopping of the knife.

8. In a loom for weaving piled fabric, proximate loom-stopping mechanism, a continually-vibrating member, which is adapted to operate said loom-stopping mechanism, a series of warp-detectors, two filling-detectors and a knife-detector, which detectors are severally adapted to bring said vibrating member into operative engagement with said loom-stopping mechanism, in combination with mechanism for driving away the knife, whenever it lingers by the knife-detector.

9. In a loom for weaving piled fabric, a normally reciprocating detector, which is actuated by the knife-carrier, and is adapted to control the loom-stopping mechanism, in combination with reciprocating mechanism for driving away the knife whenever it lingers unduly under the knife-detector.

10. In a loom for weaving piled fabric, a knife-detector, consisting of a thin plate, which is beveled at one edge, and is hinged in the path of the knife-carrier.

In testimony whereof I hereunto set my name in the presence of two witnesses.

JOSEPH CWERKA.

Witnesses:
WILLARD EDDY,
ARTHUR L. SHIPMAN.