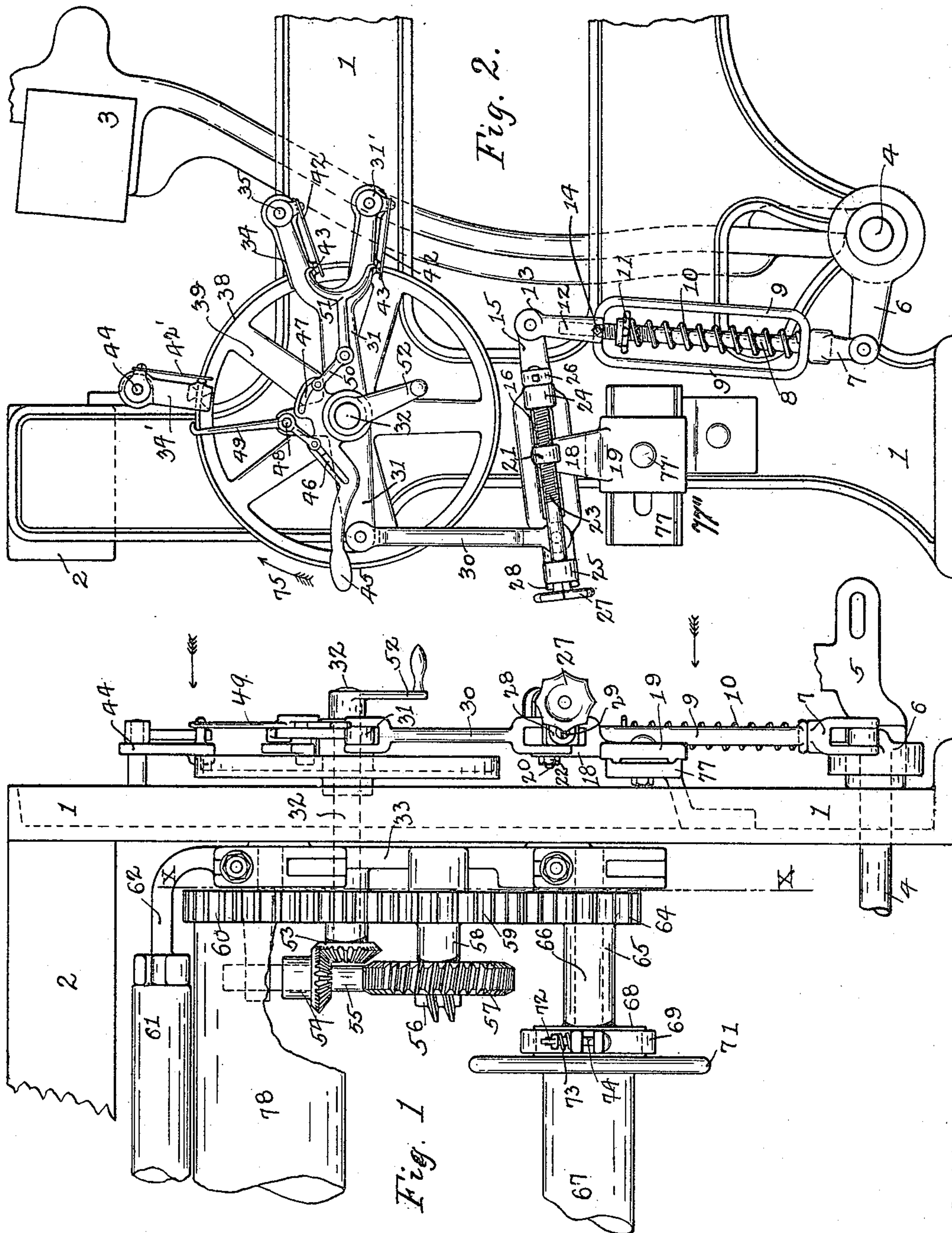


2 Sheets—Sheet 1.

No. 438,269.

Patented Oct. 14, 1890.



WITNESSES:

Wm L. Chase
Edmund F. Seymour

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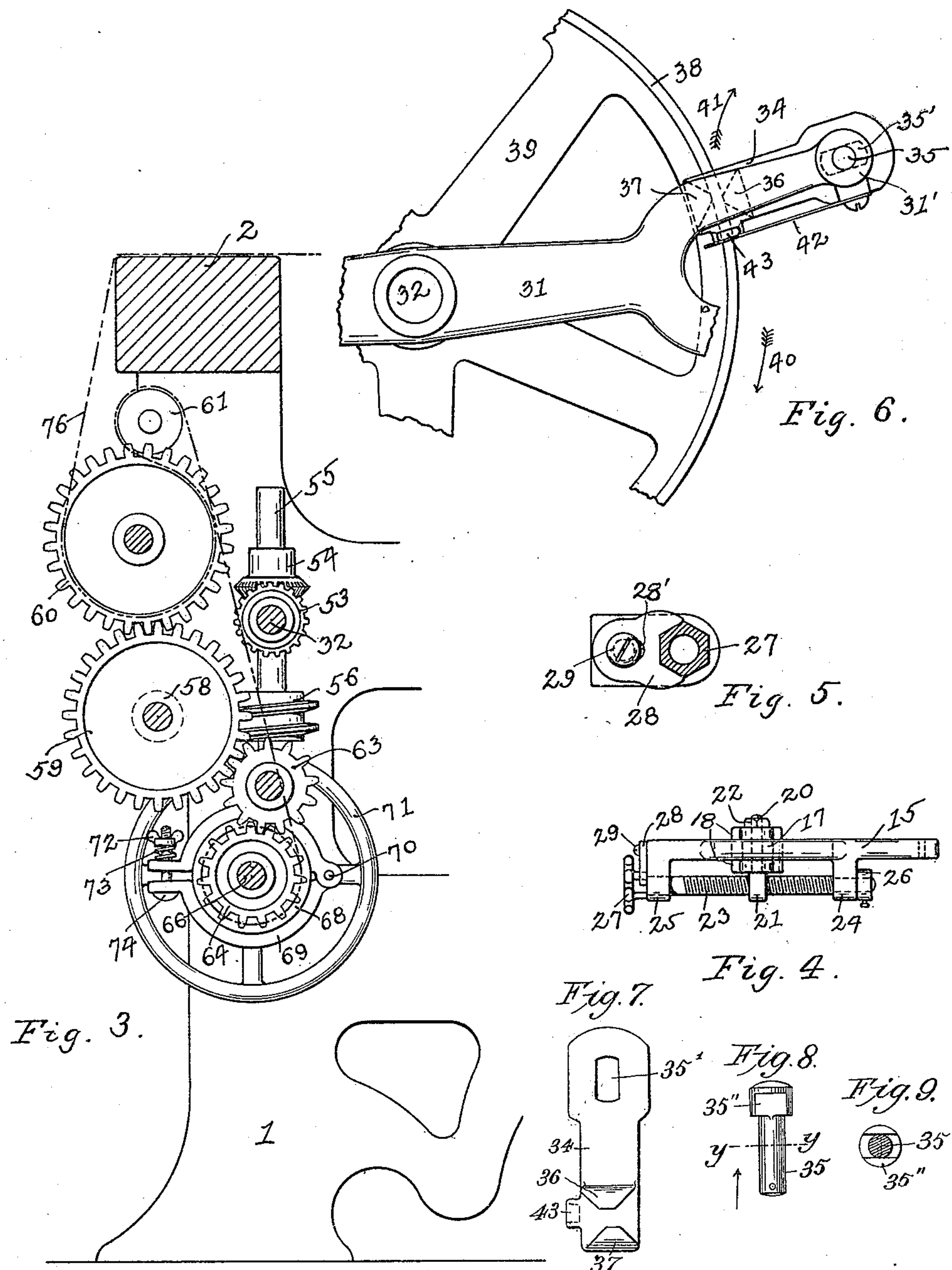
(No Model.)

2 Sheets—Sheet 2.

G. F. HUTCHINS.
TAKE-UP MECHANISM FOR LOOMS.

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UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
KNOWLES LOOM WORKS, OF SAME PLACE.

TAKE-UP MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 438,269, dated October 14, 1890.

Application filed October 17, 1889. Serial No. 327,311. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, 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 Take-Up Mechanisms for Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to looms, and more particularly to take-up mechanism for looms, in which the take-up roll is operated by a friction-grip instead of a ratchet.

The object of my invention is to provide a simple and convenient mechanism, which can be operated either positively or conditionally at will over a great range of take-up speeds without the necessity of changing a gear-train or removing any part of the mechanism. The variation in take-up speed I obtain by operating the gripping mechanism through an intermediate lever, one end of which is connected to the gripping-lever and the other end of which is given a reciprocating motion, while its pivotal point, which is located between the two connectors, can be shifted to give the desired proportion between the movements of the two connector-joints; as herein-after fully described.

Referring to the drawings, Figure 1 is a side elevation of a portion of a loom embodying my invention. Fig. 2 is an end elevation of the same looking in the direction of the arrow, Fig. 1. Fig. 3 is a section on line X X, Fig. 1, looking in direction of the arrow, same figure. Figs. 4 and 5 are details of the intermediate lever. Fig. 6 is an enlarged detail of the grip mechanism. Fig. 7 is an enlarged detail of one of the gripping-pawls detached. Fig. 8 is a detail of the pivot-pin of the gripping-pawl shown in Fig. 7; and Fig. 9 is a cross-section on line y y, Fig. 8, looking in the direction of the arrow, same figure.

In the accompanying drawings, 1 represents the loom-side, 2 the breast-beam, 3 the lay, and 4 the lay pivot-shaft, all as ordinarily arranged and constructed. Fast upon

the pivot-shaft 4, just inside the rocker-iron 5, is an arm 6, to the outer end of which is jointed the fork 7, fast upon the lower end of rod 8, which is fitted to slide freely in the yoke 9. Coiled about the rod 8 within the yoke is a spring 10, the tension of which may be adjusted by means of the hand-nut 11, threaded upon the rod 8. The end 12 of the rod 8 is turned down for a short distance to the bottom of the thread and projects through its bearing in the end of the yoke 9 between the prongs of the fork 13, integral with the yoke 9. By this arrangement a downward pull on the rod 8 is communicated to the yoke 9 through the coiled spring 10. Set-screw 14, tapped into the yoke 9, may be screwed upon the rod 8, preventing its sliding in the yoke, and thus transmitting a pull upon the rod 8 directly to the yoke 9.

Jointed to the top of fork 13 is a lever 15, in the central portion of which is a slot 16, in which is fitted to slide freely a rectangular block 17. (See Fig. 4.) Passing through the block 17 and also through the prongs 18 of forked stand 19, Figs. 1 and 2, is a pivot-bolt 20, secured in the position shown by the head 21 and nut 22, screwed to a shoulder on the end of the bolt 20, (see Fig. 4,) thus leaving the prongs 18 slack about the lever and allowing the lever to be oscillated on pivot-bolt 20. The head 21 of the bolt 20 is threaded to receive the screw 23, carried in bearings 24 and 25, integral with the lever 15. The inner end of screw 23 is turned down to the bottom of the thread, where it passes through the bearing 24, and is held in the position shown by collar 26, fast on the end of the screw 23, and the hand-wheel 27, fast upon the outer end of said screw 23. By turning screw 23 the lever 15 is moved laterally over the pivot-bolt 20 and block 17, thus changing the proportional movement of the hand-wheel end of lever 15 to the movement of the end jointed to fork 13, which is constant for a given angular movement of the lay pivot-shaft 4 when the screw 14 is set upon rod 8 or when there is no strain on spring 10.

The hub of hand-wheel 27, which is fast on the end of the screw 23, as above described, is preferably made hexagonal in cross-section, as shown in Fig. 5.

In order to hold the screw 23 in position after the same has been turned, I provide, in this instance, a locking-plate 28, having one end cut out and adapted to partially encircle the hub of the hand-wheel 27, and the other end provided with a slot 28', through which extends a screw 29, which is secured in the end of lever 15. (See Fig. 4.) By loosening screw 29 the plate 28 may be moved back away from the hub of the hand-wheel 27 by means of the slot 28' in said plate and said hand-wheel turned freely in either direction to turn the screw 23. After the screw 23 has been properly turned by means of hand-wheel 27 the plate 28 is moved forward, so as to partially encircle the hub of the hand-wheel 27, as shown in Fig. 5, and the screw 29 screwed down to hold the plate 28 and lock the hub of the hand-wheel 27.

Any other device for holding the hub of the hand-wheel 27 to lock the screw 23 in any desired position may be used in place of the device shown, if preferred.

Jointed to lever 15 near the hand-wheel end is a connector 30, which is also jointed to the gripping-lever 31, pivoted freely upon shaft 32, which passes through the loom side, and is supported in a bearing in stand 33, fast to the loom side. The gripping-lever 31 in the end opposite connector 30 in this instance terminates in a fork, to the prongs of which are pivoted two gripping-pawls 34. (Shown in detail in Fig. 6.) The pivot-studs 35 of the gripping-pawls 34 pass through hubs 31' on the ends of the fork of gripping-lever 31, and are flattened at their heads at 35'' (see Figs. 8 and 9) to fit the slots 35' in the outer ends of the gripping-pawls 34, thus allowing a slight radial motion of the gripping-pawls. Projecting from the gripping-pawls 34 are two horns 36 and 37, one outside and one inside the rim 38 of the grip-wheel 39, which is fast upon shaft 32.

Horn 36 is set on one side of a radial line from the center of the grip-wheel 39 through the center of the grip-pivot, while horn 37 is set on the other side of the same line, so that when the gripping-lever 31 is moved in the direction of the arrow 40, Fig. 6, the horns tighten upon the rim by friction, which tends to turn the gripping-pawls 34 upon their pivot-studs in the direction of the arrow 41.

The horns 36 and 37 are held in frictional contact with the rim by flat springs 42, screwed to the hubs 31' of forked lever 31 and pressing upon third horns 43, which project from the gripping-pawls on the opposite side from 36 and 37.

When gripping-lever 31 is moved in a direction opposite to arrow 40, the springs 42 allow the horns to yield and be moved by friction with the rim opposite to the direction of arrow 41, which frees the grip of the pawls 34, while not allowing the pawls to pass the radial line sufficiently to grip the rim on the other side.

Pivoted at 44 on a stud attached to the

loom side is a grip-pawl 34', similar in every way to those mounted upon the gripping-lever 31, which acts as a holdfast-pawl upon the rim of the grip-wheel, the spring 42' yielding and allowing the rim to move forward, while gripping it to prevent motion in the other direction.

For the purpose of releasing the gripping-pawls 34 and the holdfast-pawls 34', and allowing the gripping-wheel 39 and the mechanism connected therewith to be turned freely in either direction when desired, I provide a hand-lever 45, mounted loosely upon the hub of the grip-wheel 39 and provided with two slots 46 and 47. Pivoted at 48 on an arm integral with gripping-lever 31 is an angle-lever 49, to the short arm of which is fast a pin which engages slot 46, and the long arm of which is fitted to engage the holdfast-pawl 34''. Engaging slot 47 in hand-lever 45 is a pin fast in angle-lever 50, pivoted on the gripping-lever 31, the outer side of which is forked at 51 to engage the spring-horns 43 of the gripping-pawls 34.

Levers 49 and 50 and slots 46 and 47 are so proportioned that when hand-lever 45 is lifted the slots act as cams to slacken the gripping-pawls and allow the shaft to be turned by hand in either direction by means of handle 52, fast upon the end of shaft 32. Upon the inner end of shaft 32 is fast a miter-gear 53, which meshes with a miter-gear 54, fast upon an upright worm-shaft 55, supported in bearings fast to the loom side.

Fast upon the lower end of shaft 55 is a worm 56, which meshes with a worm-gear 57, fast upon the hub 58 of spur-gear 59, (see Figs. 1 and 3,) which is supported on a stud fast in stand 33, bolted to the loom side. Meshing with spur-gear 59 is a spur-gear 60, fast upon one end of the take-up roll 78 and also supported in a bearing in stand 33. Guide-roll 61 is supported from stand 33 by arm 62; also, meshing with gear 59 is an intermediate gear 63, loose upon a stud in stand 33, which in turn meshes with gear 64, fast upon sleeve 65, mounted loosely on shaft 66 of the cloth-winding roll 67, supported in bearings in stand 33; also, fast upon sleeve 65 is a friction-drum 68, which is embraced by a jointed friction-clamp 69, pivoted at 70 on an arm of hand-wheel 71, fast upon the cloth-roll 67.

The grip of the friction-clamp 69 is regulated by means of the thumb-nut 72, confining a coil-spring 73 on bolt 74, which binds the clamp 69 upon the friction-drum 68.

The gearing is so proportioned as to wind the cloth as fast as may be desired when the roll is empty, and the friction-clamp 69 is adjusted to wind the cloth as tightly as desired, the clamp 69 slipping on the drum 68 for the motion imparted to it beyond that point.

The motion of the lay in beating up through arm 6 and yoke-connectors 8 and 13, intermediate lever 15, connector 30, gripping-lever 31, and wheel 39 turns the shaft 32 forward in the direction of the arrow 75, Fig. 2, which,

through the worm-shaft 55 and gearing-train 59, 60, 63, and 64, takes up the cloth from the loom, as indicated by dotted line 76, Fig. 3.

The levers, the gripping-drum, and gears are so proportioned that a given movement of the lay and arm 6 by means of the adjustment of pivot-bolt 20 in slot 16 of lever 15 gives the desired range of take-up speeds, the speed being greater as the pivot-bolt 20 is moved toward the yoke-connector 13 and less as it is moved away from it.

In order to keep the connectors 8, 13, and 30 working in direct lines about as shown in Fig. 2, I preferably mount the forked pivot-stand 19 on a plate 77, secured to the loom side, said stand 19 having lips extending out from the inner side thereof, which extend between corresponding lips on the upper and lower edge of the plate 77, enabling said stand 19 to be adjusted horizontally on the plate 77 to correspond to the position of pivot-bolt 20. A bolt 77', extending through the stand 19 and a slot 77'' in the plate 77, secures the stand 19 in its adjusted position.

When it is desired to work the take-up conditionally on account of uneven filling or otherwise, the tension of the spring 10 is adjusted by means of hand-nut 11 to give the proper strain on the cloth, beyond which point in the movement of arm 6 the spring gives and the take-up rests.

When in order to repeat accurately the design in the pattern or for other reasons, it is desired to put in a fixed number of picks per inch without reference to the strain put upon the cloth, the set-screw 14 is set on the rod 8, when the full movement of arm 6 is transmitted proportionally to the take-up at each beat of the lay.

I am enabled by the mechanism above described to dispense with all change of gears or ratchets and at the same time to vary the speed of the take up over as great a range as may be required in practice and to make the variation in finer degrees than can be done with ratchets, and to make the changes without stopping the loom, which advantages will be fully understood and appreciated by those skilled in the art and by those who have employed the ordinary method of carrying a large line of change gears or ratchets and selecting and putting on the right ones.

I have shown the gripping-wheel 39 connected to the take-up gearing through shaft 32, a pair of miter-gears, and a worm and gear, while the worm and gear act as a partial check upon the take-up mechanism running back by the strain on the cloth, and is thus of advantage aside from gearing down in sufficient proportion to work very fine pitches. It is not a necessary feature of my improvement, as I can use a pinion upon the inner end of shaft 32, meshing directly with the take-up gearing-train. In this case it might be necessary to apply a second holdfast-pawl, similar to 34', to the gripping-wheel 39 to hold the strain securely.

I have shown my adjustable rocker-lever operated by a fixed arm on the lay pivot-shaft. The rocker-lever could of course with equal facility be driven by any of the other common methods employed in take-up mechanisms, as cranks, eccentrics, or cams.

Other details of construction of my improved take-up mechanism may be changed without departing from the principle of my invention.

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

1. In a take-up mechanism for looms, the combination, with the lay and take-up roll, of a rocker-arm fast on the lay pivot-shaft, a connector to an intermediate rocker-lever, and said intermediate rocker-lever mounted adjustably on a pivot, a connector to a gripping-lever, and said gripping-lever provided with frictional gripping-pawls, a holdfast-pawl, a gripping-wheel, shaft, and gearing-train, substantially as described.

2. In a take-up mechanism for looms, the combination, with the lay and take-up roll, of a rocker-arm fast on the lay pivot-shaft, a connector to an intermediate rocker-lever, and said intermediate rocker-lever mounted adjustably on a pivot, a connector to a gripping-lever, and said gripping-lever provided with frictional gripping-pawls, a holdfast-pawl, releasing-levers, a gripping-wheel, shaft, and gearing-train, substantially as described.

3. In a take-up mechanism for looms, the combination, with the lay and take-up roll, of a rocker-arm fast on the lay pivot-shaft, a connector-rod, coiled spring, adjusting-nut, connector-yoke, and set-screw, an intermediate rocker-lever mounted adjustably on a pivot, a connector to a gripping-lever, and said gripping-lever provided with frictional gripping-pawls, a holdfast-pawl, a gripping-wheel, shaft, and gearing-train, substantially as described.

4. In a take-up mechanism for looms, the combination, with the lay and take-up roll, of a rocker-arm fast on the lay pivot-shaft, a connector to an intermediate rocker-lever, an intermediate rocker-lever provided with a slot throughout its central portion, a pivot-block, pivot-bolt, adjusting-screw, hand-wheel, and check-slide, adjustable pivot-stand, and means for adjusting the same, a connector to a gripping-lever, and said gripping-lever provided with frictional gripping-pawls, a holdfast-pawl, a gripping-wheel, shaft, and gearing-train, substantially as described.

5. In a take-up mechanism for looms, the combination, with the take-up gearing-train, of a geared friction-drum actuated by the said train, adjustable friction-clamp pivoted on a hand-wheel fast on the cloth-winding roll, and means for adjusting said friction-clamp, the hand-wheel, and cloth-roll, substantially as described, and for the purpose set forth.

6. In take-up mechanism for looms, the combination, with a gripping-wheel, frictional

gripping-pawls, a gripping-lever, and hold-fast-pawl, of a hand-lever and releasing-levers, substantially as set forth.

5 7. In take-up mechanism for looms, the combination, with a take-up roll, connections to a gripping-wheel, and said gripping-wheel, a gripping-lever provided with gripping-pawls, connector to a rocker-lever, and said rocker-lever mounted on a pivot, and means

for operating said rocker-lever, of means for releasing the gripping-pawls to allow of the free revolution of the gripping-wheel, consisting of a lever and releasing-levers to engage the pawls, substantially as set forth.

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Witnesses:

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