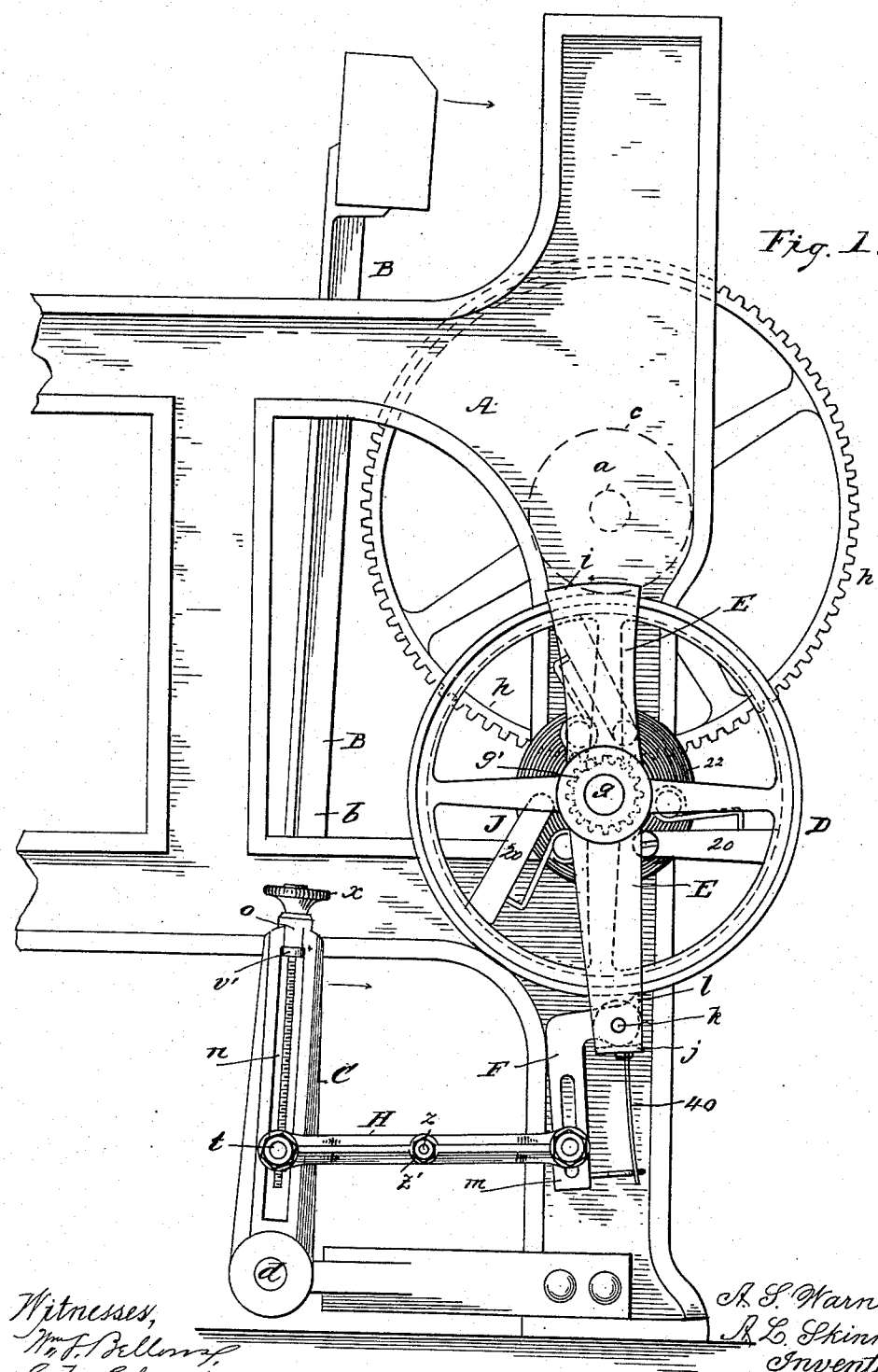
(No Model.) 3 Sheets—Sheet 1.

A. S. WARNER & A. L. SKINNER.

TAKE-UP MECHANISM FOR LOOMS.

No. 413,155. Patented Oct. 15, 1889.

Fig. 1.



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(No Model.)

3 Sheets—Sheet 2.

A. S. WARNER & A. L. SKINNER.

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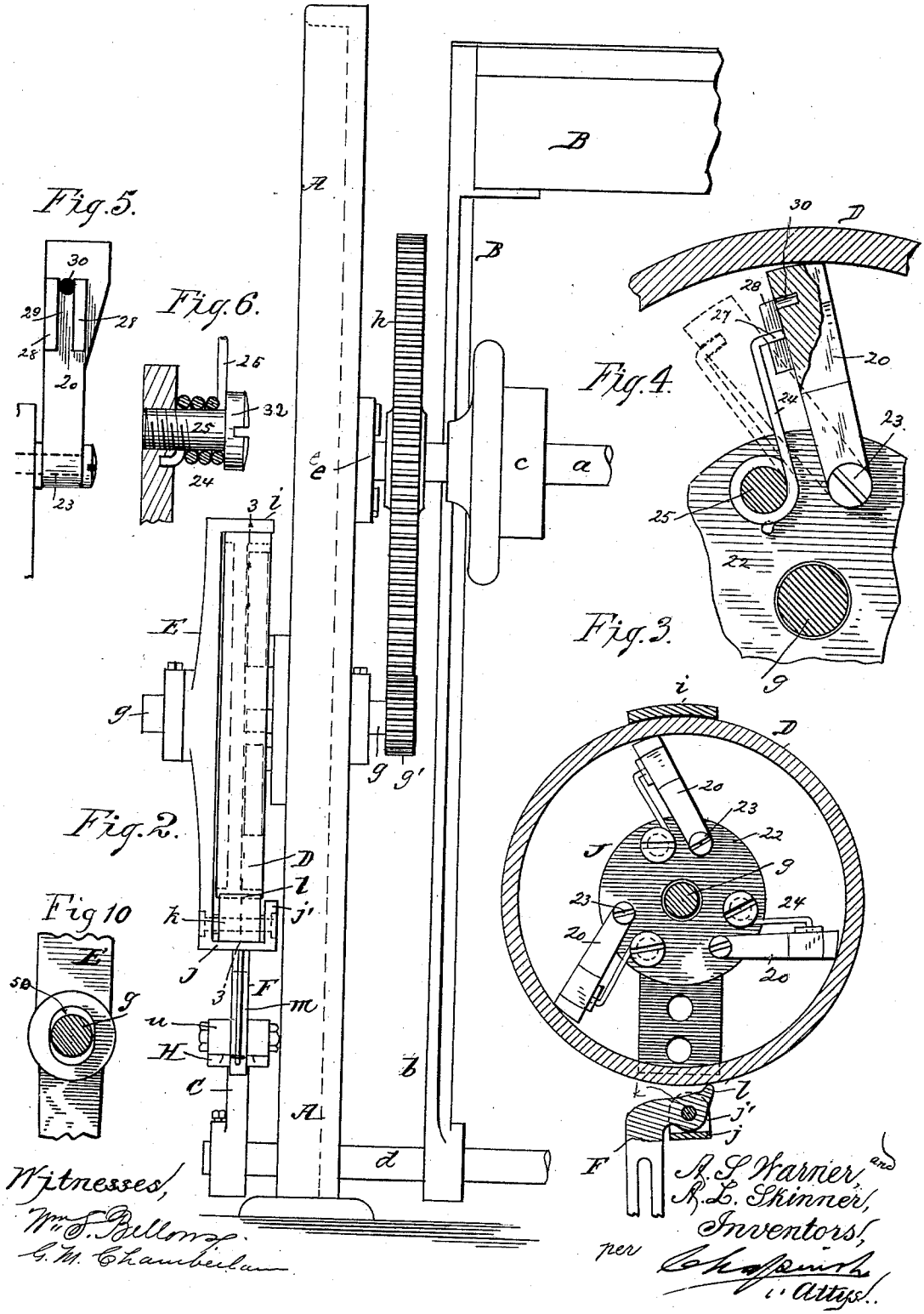

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(No Model.)

3 Sheets—Sheet 3.

A. S. WARNER & A. L. SKINNER.

TAKE-UP MECHANISM FOR LOOMS.

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Fig. 8.

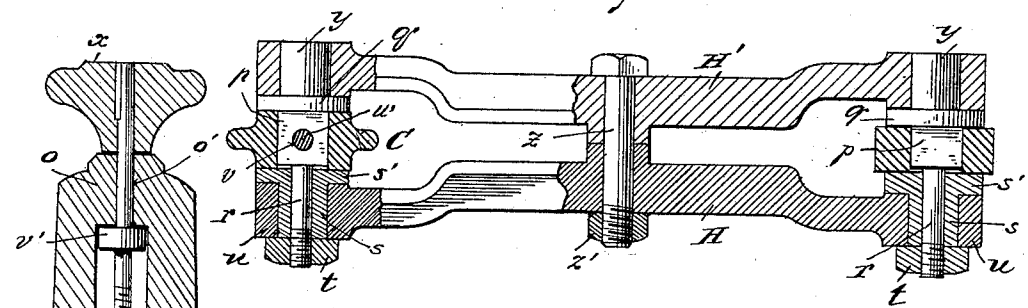


Fig. 7.

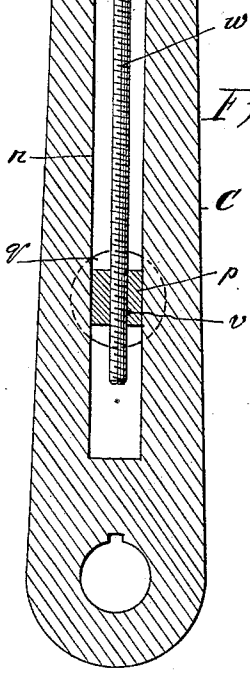
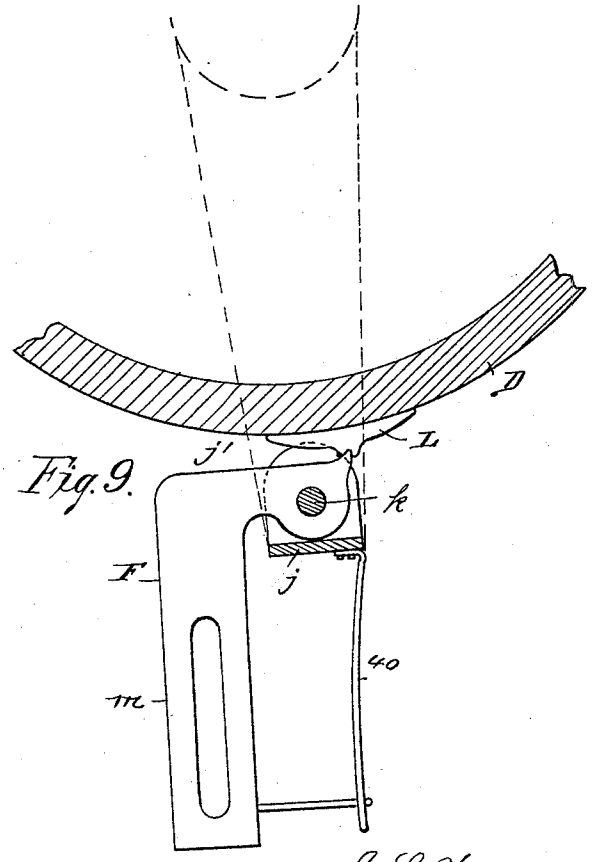


Fig. 9.



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UNITED STATES PATENT OFFICE.

AMAZIAH S. WARNER AND ALLEN L. SKINNER, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNORS OF ONE-FOURTH TO GEORGE C. WILSON, OF SAME PLACE.

TAKE-UP MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 413,155, dated October 15, 1889.

Application filed March 18, 1889. Serial No. 303,794. (No model.)

To all whom it may concern:

Be it known that we, AMAZIAH S. WARNER and ALLEN L. SKINNER, citizens of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Take-up Mechanism for Looms, of which the following is a specification.

This invention relates to improvements in take-up mechanism for looms, the object thereof being to provide a mechanism adjustable as to the parts thereof and intervening between the lay-frame and the take-up roll or cloth-beam, whereby, in the running of the loom for the making of any desired grade of cloth, the take-up roll, through the said adjustable connections, will have a rotation and peripheral movement exactly corresponding to the production of the cloth by the loom; and the invention consists in the construction and combination of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an elevation of a portion of the end of a loom, having applied thereto take-up mechanism for rotating the cloth-beam intermittingly, embodying our improvements. Fig. 2 is an elevation of a portion of the front of the loom, being of the same parts shown in Fig. 1, but at right angles thereto. Fig. 3 is a view illustrating a friction-clutch employed in the present take-up mechanism as in its working relation to and on the rim of a pulley also comprised in said mechanism, which pulley-rim and parts of the driver therefor are shown in section on the plane indicated by the line 3 3, Fig. 2. Figs. 4, 5, and 6 are views on an enlarged scale of detail parts of said clutch mechanism, to be hereinafter particularly referred to. Fig. 7 is an enlarged central vertical section of an arm to be connected to and movable with the lay-frame, and showing the adjusting means carried thereby for the connection of the link, hereinafter referred to. Fig. 8 is a horizontal sectional view of the link between the arm last mentioned and parts of the swinging driver for the take-up. Fig. 9 is a view illustrative of a modification of construction, to be hereinafter referred to. Fig. 10 is a detail view of the hub of the driver, hereinafter referred to.

In the drawings, A represents a portion of the end frame of a loom, and B the lay-frame, which by the bottom of the arms *b* thereof is pivotally mounted on a horizontal shaft *d*, having suitable bearings in the frame of the machine, said shaft projecting beyond the end of the frame and receiving thereon the upwardly-projecting rigid radial arm C.

a represents the shaft for the cloth-beam or take-up roll, mounted in bearings *e* in the frame of the machine. For wide goods the take-up consists of a long roll fixed on or adapted to be connected as one with said shaft *a*, while for narrow goods, as tape or ribbon, several rolls, as *c*, are mounted on the take-up shaft at suitable intervals in the width of the loom. With said take-up rolls the fabric produced by the loom is to have a frictional contact, said fabric being held in such contact by any suitable means, as by additional pressure and guide rolls, and all as usual or desirable under ordinary and well-known construction.

g represents a short shaft or stud rotatable in suitable bearings in the frame A, and projecting both inwardly and outwardly a short distance therefrom, and on said shaft is a pinion *g'*, with which meshes a gear *h* of large diameter, that is fixed on the take-up shaft *a*. Outside of the frame on said shaft *g* is fixed a pulley D, and also on said shaft, outside of the said pulley, is mounted by an intermediate portion and to loosely swing thereon a driver-lever E, having at the end of its upper arm an angular projection *i* to fit and bear upon the outer periphery of the rim of the pulley, and said driver is adapted by mechanism to be hereinafter set forth, when swung in one direction, to bind on the outer periphery of said pulley to turn it, and on being swung in the opposite direction to move over the periphery without effect to turn the pulley. On the end of the lower arm of the driver, which is extended somewhat below the rim of the pulley, is an angular projection *j*, provided on its inner side with an earpiece *j'*, and a pivot-bolt *k* passes through

and is supported in the lower end portion of the driver, and said ear-piece, on which is pivoted a dog F, provided at one side of its pivotal point with a nose *l* for engagement, when properly swung, with the outer periphery of the pulley, said dog at the other side of its pivotal point being rearwardly and then downwardly extended in an angular arm *m*. The bore or opening of the hub of the driver-lever is slightly elongated in the direction of the length of the said lever, as seen in Fig. 10.

Between the radial lever-arm C, fixed on the shaft *d* for the lay-frame and the downward extension of the dog F, is a link H, adapted to be adjustably secured to one or both of said parts. As particularly shown in Figs. 1, 8, and 9, such connections are made as follows: The said arm C has a longitudinal slot *n* therein, extending from near its hub to within a short distance of its outer end, where it is formed with a cross-web *o* of hub form, having a central bore *o'* in the direction of the length of said slot. A block *p* fits to slide in said slot, having at its one end a head *q*, and at its other it is necked down and outwardly extended in a spindle *r* of reduced diameter. It will be noticed that the central or block portion *p* of the part just described is of slightly less length than the width of the slot-walls. (See Fig. 8.) A sleeve *s*, having at its inner end an outwardly-extending flange *s'*, lies loosely over said spindle *r*, and over said sleeve fits the bore of the hub *u* at one end of the said link, and is held in place by the nut *t*. A similar form of connection is shown as employed for uniting the other end of said link with the slotted arm of the dog F. By tightening the nut the sleeve-flange is forced against one side of the lever or dog-arm, and the head *q* of the said block is drawn against the other side of said lever or arm. On unloosening the nut the block is free to be moved up or down in its guiding-slot, and a practical and efficient means for so moving said block and securing a minute adjustment thereof for regulating the throw of the driver and resultant amount of take-up will be seen on reference to the sectional view of the arm C, Fig. 7, wherein the said block *p* is shown as provided with a vertical screw-threaded opening *v*, with which engages the threads of a vertical screw-rod *w*, having a shoulder, as at *v'*, which lies beneath the hub-web *o* of the arm, said rod being upwardly projected through and beyond the bore of said hub-web and receiving a head *x*, having a knurled rim, said head being keyed on said rod and employed for conveniently turning the rod.

In order that the link-connection between the arm C and dog-arm *m* may act evenly and without any tendency to lateral or torsional draft on either of said parts, whereby they would be forced out of a vertical plane for their most efficient operation, a duplicate link H' is provided, as seen in Fig. 8, by its hub-bore loosely fitting over the circular and somewhat reduced portion *y* of the head of each block *p*. The said duplicate link H' is held against its fellow and in its bearing on the circular heads of the said blocks by the bolt *z*, passed through an intermediate part of each of said link members and retained to its confining action by a nut *z'*.

Fixed on the frame of the loom, just within the pulley D, is a clutch mechanism J, consisting of one or more pawls 20, pivoted by their inner ends on the loom-frame, or, what is the same in substance, on a disk 22, bolted thereto. Each pawl from its pivotal point 23 extends outwardly toward the inner periphery of the pulley-rim in a line which is more or less at an angle to a line truly radial from the center of the said pulley and passed through said pivotal point, said pawl being held to a bearing by its end on the said periphery by a spring 24 suitably applied.

An approved construction of the spring-pawl device will be particularly seen on reference to Figs. 4, 5, and 6. The spring consists of a length of spring-wire by a portion thereof near one end formed into one or more convolutions to encircle a fixed stud 25, and said end adjacent thereto being secured to the disk, the other end portion of said wire constituting a spring-arm 26, to bear on the edge of the pawl, and formed with an angular end 27. The edge of the pawl is provided with two parallel ribs 28, with an intermediate channel 29 between them, and in which said spring-arm lies and is held to operative position on the pawl. Beyond the end of the angular extremity of the spring-arm is an aperture 30 in the pawl, and should it be desired to hold the clutch-pawl out of operative engagement with the pulley—as, for instance, at the time of setting up the take-up mechanism—by forcing the pawl rearwardly against its spring, allowing the angular point of the latter to enter the said aperture, as indicated in dotted lines in Fig. 4, owing to the fact that the spring-arm and pawl swing from different centers, the pawl and spring will interlock, and so remain that the end of the pawl will be out of contact with the rim of the pulley. The stud 25 is formed with a head 32, to prevent the spring-coils from being detached from its shank. (See Fig. 6.)

In operation, on the forward swing of the lay-frame the arm C also swings therewith, and a forward thrust of the link H will result, having a greater or less extent, according as the connection thereof with said arm C is farther from or nearer the center of oscillation thereof. As the link moves forward the vertical arm of the dog is thereby swung forward, the nose of said dog at the other side of the pivotal point immediately swinging upwardly and rearwardly against the outer periphery of the pulley, and, working between its pivotal point and the said rim, exerts a prying action on the driver to draw it slightly downwardly, its elongated hub-bore 50 passing over the shaft *g* and bringing its angular

extension *i* into a firm bearing on the upper portion of the pulley's periphery for turning the pulley a slight distance. The clutch pawl or pawls are so applied that such positive feed motion of the pulley is in no way interfered with; but as the lay-frame assumes its reverse movement, and the dog-lever swings rearwardly and its nose downwardly, the driver-lever is permitted to recede over the rim of the pulley for a new grip, and any liability of backward movement of the said pulley resulting from friction on the retracing of the movable parts thereon will be positively prevented by the pawls.

In order that there may be no lash or freedom of movement between the nose of the dog and the rim of the pulley as the parts retrace, whereby a lost motion might be had on the forward movement of the arm C before the take-up mechanism is caused to operate, a spring 40 is applied between the end of the driver and the vertical arm of the dog to cause the latter to be so swung that its nose will always be in contact on the pulley-rim.

It will be plain that on loosening the nut *t* and turning the head *x* of the screw-rod *w* the end of the link may be nicely adjusted on the arm C, so as to have any length of throw desired, and that the take-up roll will from any given step of the pulley be given a proportionate movement to take up the fabric, and under the adjustable devices, substantially as described, the take-up may be readily and accurately set to move to any desired extent, according to the grade of cloth which it is desired to produce in the loom.

In Fig. 9 a shoe L of extended bearing area is shown as interposed between the nose of the dog F and the rim of the pulley, by the provision of which the surface of said rim will not become serrated or indented.

What we claim as our invention is—

1. In a take-up mechanism for looms, the combination, with the lay-frame and the radial arm C, fixed on the pivotal shaft of said lay-frame, provided with the longitudinal slot, and the driver-lever, of the block *p*, movable in said slot, having at one end a head and at the other a spindle projection, a sleeve fitted on the said spindle and bearing on the side of the arm, the link by one end suitably connected to the driver-lever and at its other provided with a bored hub fitting over said sleeve, and the nut *t*, substantially as described.

2. The combination, with the take-up roll and a pulley connected thereto, the lay-frame and the radial arm C, fixed on the pivotal shaft thereof, of a driver-lever having a hub-bore elongated in the direction of the length of said driver and provided at the end of one arm with the angular projection *i*, and having an angular dog F, pivoted to the end of its other arm, and a connection between said arm C and one arm of said angular dog, substantially as described.

3. The combination, with the take-up roll and a pulley connected thereto, the lay-frame, and the radial arm C, fixed on the pivotal shaft thereof, of a driver-lever having a hub-bore elongated in the direction of the length of said driver and provided at the end of one arm with the angular projection *i*, and having an angular dog F, pivoted to the end of its other arm, a spring applied between said dog and said driver, and a connection between said arm C and one arm of said angular dog, substantially as described.

4. In a take-up mechanism for looms, the combination, with the lay-frame and the radial arm C, fixed on the pivotal shaft of said lay-frame, provided with a longitudinal slot, and the driver-lever and the angular dog F, having an aperture or slot in the arm *m* thereof, of the blocks *p p*, fitting in said slots, each having at one end a head with a circular portion *y*, and at the other a spindle projection, a sleeve fitted on each of said spindles and bearing on the adjacent side of the arm, a link H, provided at each end with bored hubs fitting over said sleeves, and a duplicate link fitting by its bored hubs over the circular headed portions of said blocks, and a bolt-and-nut connection intermediately of said links, substantially as described.

5. In a take-up mechanism for looms, the combination, with the take-up roll and the pulley connected thereto, of a spring-actuated pawl-arm pivotally attached to the frame of the loom and provided with an aperture 30, and a spring-arm 24, by one end fixed to the frame of the loom and having its other end formed with an angular projection, substantially as and for the purpose described.

6. In a take-up mechanism for looms, the combination, with the take-up roll and the pulley connected thereto, of a spring-actuated pawl-arm pivotally attached to the frame of the loom and provided with the channel 29 and the aperture 30, and a spring-arm 24, by one end fixed to the frame of the loom and having its other end formed with an angular projection, substantially as and for the purpose described.

7. In combination, the take-up roll and a pulley connected thereto, the lay-frame and the radial arm C, fixed on the pivotal shaft thereof, the driver-lever having angular projection *i* and provided with the elongated hub-bore fitting over the pulley-carrying shaft, and the angular dog F, pivoted thereto, the spring 40, applied between said dog and driver, a block longitudinally movable in said arm C, and means for securing it against movement, a link between and secured to said block and one arm of said dog, and a clutch mechanism affixed to the frame of the loom and engaging said pulley, substantially as and for the purpose described.

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