

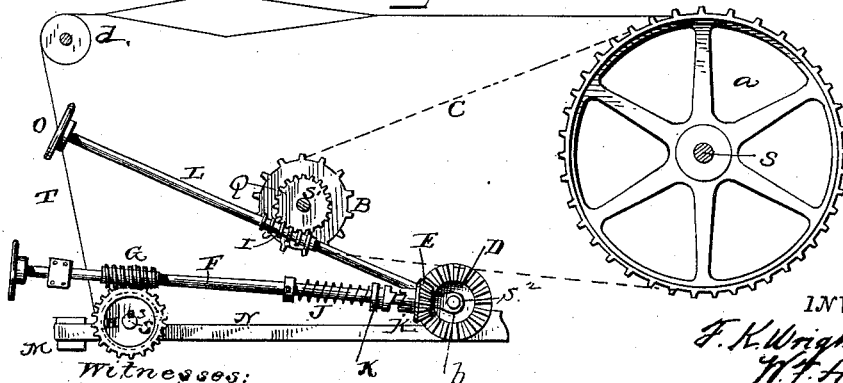
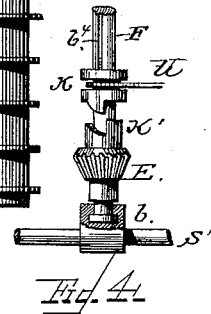
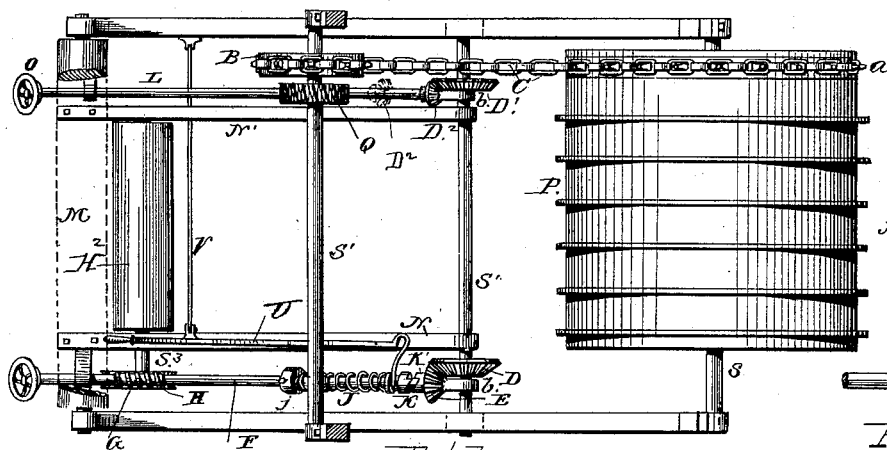
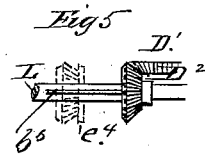
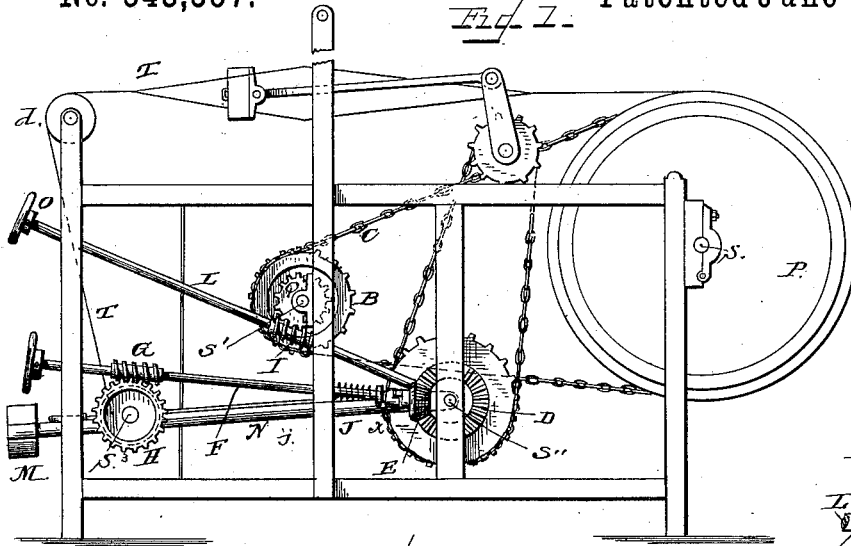
(No Model.)

F. K. WRIGHT & W. F. HITCHCOCK.

TAKE UP AND LET OFF MECHANISM FOR LOOMS FOR WEAVING WIRE, &c.

No. 343,557.

Patented June 8, 1886.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

FREDERICK K. WRIGHT AND WILLIAM F. HITCHCOCK, OF HOMER, N. Y.

TAKE-UP AND LET-OFF MECHANISM FOR LOOMS FOR WEAVING WIRE, &c.

SPECIFICATION forming part of Letters Patent No. 343,557, dated June 8, 1886.

Application filed July 3, 1885. Serial No. 170,634. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK K. WRIGHT and WILLIAM F. HITCHCOCK, citizens of the United States, residing at Homer, in the county of Cortland and State of New York, have invented certain new and useful Improvements in Take-Up and Let-Off Mechanisms for Looms for Weaving Wire and other Cloth; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our present invention is an improvement in machinery to be applied to looms for weaving wire and other cloth; and it consists, essentially, in the combination and arrangement of certain mechanical devices, whereby a given quantity of wire or other warp is let off and taken up sufficient only to form the desired mesh, whether two are required to the inch, or more, up to a hundred within the same space.

As an example, to illustrate the purpose of our improvement, suppose twelve meshes to the inch are required in the cloth. The warp-drum of our loom is regulated to move at such a speed as to release or let off one-twelfth of an inch of wire for every stroke of the lay or change of heddles, so that at the time of the twelfth beat there shall have been one inch of the warp-threads let off from the drum, and within the time a corresponding length of the fabric woven. In order to take up and wind this fabric after it has been woven, we provide a roll, which, when in motion, revolves a trifle faster than the drum releases the warp. The irregularity or difference of movement is compensated for in a manner hereinafter to be described.

In the machinery which constitutes our improvement the fabric is wound automatically during the process of weaving.

Figure 1 is a side elevation of a part of a loom having the invention applied thereto. Fig. 2 is a plan view thereof partly broken away. Fig. 3 is a partly sectional side elevation showing a skeleton of several parts of the machinery. Fig. 4 is a partly sectional detail showing the clutch hereinafter described and connected parts. Fig. 5 is a detail view.

Similar reference-letters indicate like parts in all of the figures.

Referring to the drawings, S'' is a shaft journaled in the main frame of the loom, which has fixed or keyed upon it a bevel gear-wheel, D, and another bevel-wheel, D'. There is also upon shaft S'' a clasp, b, loosely connected with shaft F. The shaft F has on one end a loose bevel-pinion, E, which has secured to it one part, K', of a clutch, which part K' moves with said pinion when disengaged from its fellow without function, but may be thrown into gear automatically, as will be hereinafter described. There is also loosely hung upon the shaft S'', with suitable bearings, a weighted frame, M N N', which carries the cloth-winding roll and other mechanism associated with it, all to be described hereinafter. The sprocket-wheel B is fixed upon a shaft, S', and its sprockets are engaged by a chain, C, which also passes around a larger sprocket-wheel, a, fixed upon the warp-drum P, upon which the warp-threads are wound.

S is the shaft which forms the axis of the warp-drum P, the latter requiring no special mention, as it is of the usual form, and it is fixed in its usual place in the loom.

At the end of a shaft, L, radiating from shaft S'' is a bevel-pinion, D<sup>2</sup>, which engages the corresponding bevel-wheel, D', on said shaft S''. The said pinion D<sup>2</sup> is fixed upon shaft L, so that it may slide longitudinally upon spline b<sup>2</sup>, when it is necessary to disengage said pinion from wheel D', where it may be held out of the way by a pin, e', placed in said shaft L. Upon said shaft L is a screw, I, adapted to mesh with a corresponding screw-wheel, Q, fixed upon shaft S'. The shaft F, which also radiates from the axis of shaft S'', finds a loose bearing in the clasp b. The shaft F has secured to it a screw, G, a clutch portion, K, adapted to slide on a spline b<sup>1</sup>, fixed longitudinally upon said shaft, a corresponding clutch portion, K', and a bevel-pinion, E, which moves with the said clutch portion K' and gears with the bevel-wheel D, fixed to said shaft S'. The clutch portion K', pinion E, and wheel D move constantly with the motion of the shaft S''; but the shaft F moves, carrying with it the screw G, only when the two portions K K' of the clutch are in contact. The screw G gears with a worm-wheel, H, fixed upon the winding-roll for the fabric, and moves the said roll H<sup>2</sup> at intervals

to wind the cloth. The winding-roll  $H^2$  is fixed upon the shaft  $S^3$ , journaled upon suitable bearings in the swinging frame-work composed of the beams  $N\ N'$  and weighted portion  $M$ . This weighted frame has a movement at intervals, in the process of weaving, about the shaft  $S'$  as an axis, and carries with it the winding-roll  $H^2$  and shaft  $F$ , the screw  $G$  and wheel  $H$  being kept in gear constantly. The warp threads or wires in the usual manner pass from the warp-drum  $P$ , and the fabric as woven passes over the roll  $d$ , thence down and about the winding-roll  $H^2$ . The roll  $d$ , journaled in the frame of the loom, serves as a bearing for the fabric, and the weighted frame  $NN'M$ , carrying the cloth-roll, keeps the fabric under constant tension during the process of weaving.

Attached to the frame of the loom by a hinge-joint is a rod or cord,  $V$ , hinged to a lever,  $U$ , the latter having its fulcrum upon the beam  $N$  of the weighted frame. The lever  $U$  is automatic in its movement, and is for the purpose of operating the portion  $K$  of the clutch  $K\ K'$ . A spring,  $J$ , is coiled about the shaft  $F$ , being retained between collar  $j$ , fixed to said shaft, and the portion  $K$  of the clutch  $K\ K'$ . The lever  $U$  has a hooked portion near its fulcrum, which engages a groove in the portion  $K$  of the clutch.

The movement of the different parts of the mechanism which constitute our invention may be described as follows: Shaft  $S''$  receives motion from the source of power, and through bevel gear-wheels  $D' D^2$  rotates the shaft  $L$  and worm  $I$ , the latter driving the wheel  $Q$  and sprocket-wheel  $B$ , and the latter, through the medium of the chain  $C$ , drives the sprocket-wheel  $a$  and the warp-drum  $P$ , the warp moving from the said roll  $P$  so fast only as is required during the movement of the machinery. The warp is kept under constant strain, on account of the cloth being attached to the cloth-roll  $H^2$ , journaled in the weighted frame. The bevel gear-wheel  $D$  being moved by shaft  $S''$ , its motion is imparted to the pinion  $E$ , and clutch  $K\ K'$  being in mesh, the shaft  $F$  is rotated, carrying with it the worm or screw  $G$ , which in turn moves gear-wheel  $H$  and cloth-roll  $H^2$ . The gearing between the driving-shaft  $S''$  and shaft  $S^3$  is so proportioned as that the latter shaft and winding-roll moves faster than the warp-drum pays out the warp, consequently more fabric is wound up in a given time than is let off, the weighted frame  $M\ N\ N'$  rising as the cloth is wound on roller  $H^2$ , and the cloth being kept under constant tension during said movement by the weight of the frame. When the weighted frame, during the movement of the winding-roll, is carried to a sufficient height, the rod or cord  $V$  influences the lever  $U$  and draws it toward the center of the loom to disengage the two portions of the clutch  $K\ K'$ , thus arresting the movement of the winding-roll about its axis, and allowing the weighted frame to gravitate as fast as the fabric is woven. When at its low-

est point, the rod  $V$  throws the clutch  $K\ K'$  again into gear, thus renewing the rotary movement of the winding-roll.

If a cord be used in connection with the lever  $U$ , instead of the rod  $V$ , the spiral spring  $J$  performs the function of throwing the clutch  $K\ K'$  into gear. As previously stated, the weighted frame  $NN'M$  is carried up from the motion of shaft  $S''$ , while the clutch  $K\ K'$  is in gear, and down by the force of gravity, while the weaving continues without cessation.

Upon the shaft  $L$  is a hand-wheel,  $O$ , which is provided to be used when it is necessary to rotate the warp-drum to correct errors in case a break takes place, in which case it is necessary to detach or ungear bevel-gears  $D' D^2$ .

We give the present arrangement as one required for goods of a certain mesh, but do not wish to be limited to this precise arrangement so long as we hold the principles involved in our invention intact.

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

1. The combination, with the shaft  $S''$ , the gear-wheel  $D'$ , fixed upon the said shaft, the shaft  $L$ , provided with pinion  $D^2$ , gearing with wheel  $D'$ , and worm  $I$ , shaft  $S'$ , and wheel  $Q$ , fixed upon shaft  $S'$ , gearing with said worm  $I$ , of the sprocket-wheel  $B$ , fixed upon shaft  $S'$ , the warp-drum  $P$ , the sprocket-wheel  $a$ , fixed upon the warp-drum  $P$ , and chain  $C$ , all arranged, substantially as described, to pay off the warp-threads as the same are taken up, as specified.

2. The combination, with the driving-shaft  $S''$ , wheel  $D$ , fixed upon the driving-shaft  $S''$ , pinion  $E$ , loosely mounted upon shaft  $F$  and in mesh with said wheel  $D$ , clutch portion  $K'$ , fixed to said pinion  $E$ , shaft  $F$ , swivel-clasp  $b$ , clutch portion  $K$ , arranged to slide axially upon said shaft  $F$ , spring  $J$ , encircling shaft  $F$ , and worm  $G$ , fixed upon said shaft  $F$ , of the weighted frame  $M\ N\ N'$ , arranged to swing about the shaft  $S''$  as an axis, clutch-shifter  $U\ V$ , wheel  $H$ , shaft  $S^3$ , journaled in said weighted frame, and winding-roll  $H^2$ , fixed upon shaft  $S^3$ , all arranged as and for the purpose set forth.

3. The combination, with shaft  $S''$ , the weighted frame  $M\ N\ N'$ , arranged to vibrate about the shaft  $S''$  as an axis, shaft  $S^3$ , the winding-roll  $H^2$  and gear-wheel  $H$ , both fixed upon shaft  $S^3$ , shaft  $F$ , provided with worm  $G$ , gearing with said wheel  $H$ , and carrying clutch  $K\ K'$ , pinion  $E$  and spring  $J$ , and clutch-shifter  $U\ V$ , of the roll  $d$  and warp-drum  $P$ , and means of rotating said drum, as and for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

FRED. K. WRIGHT.  
WM. F. HITCHCOCK.

Witnesses:

W. H. CRANE,  
W. SAUTERS.