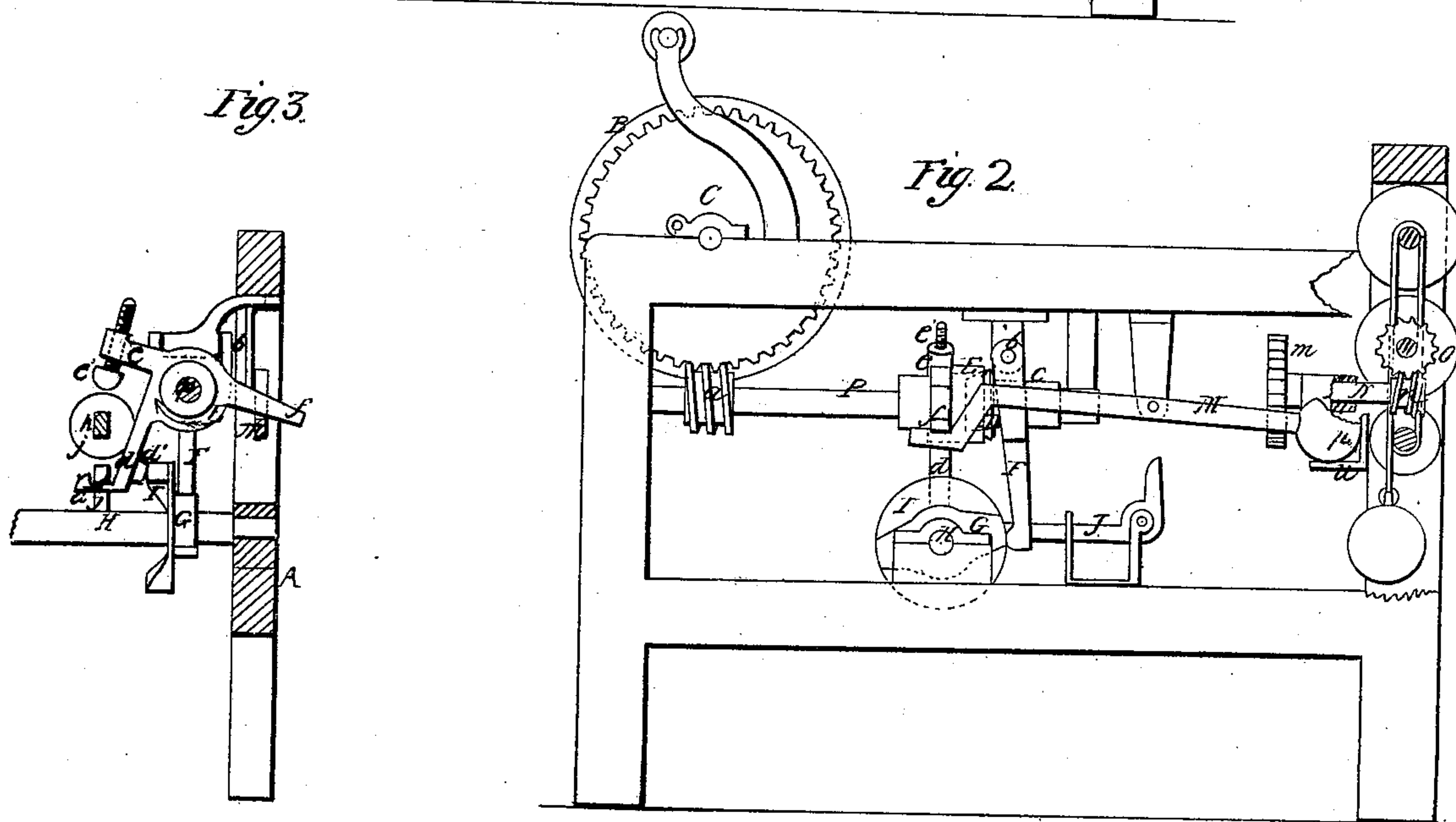
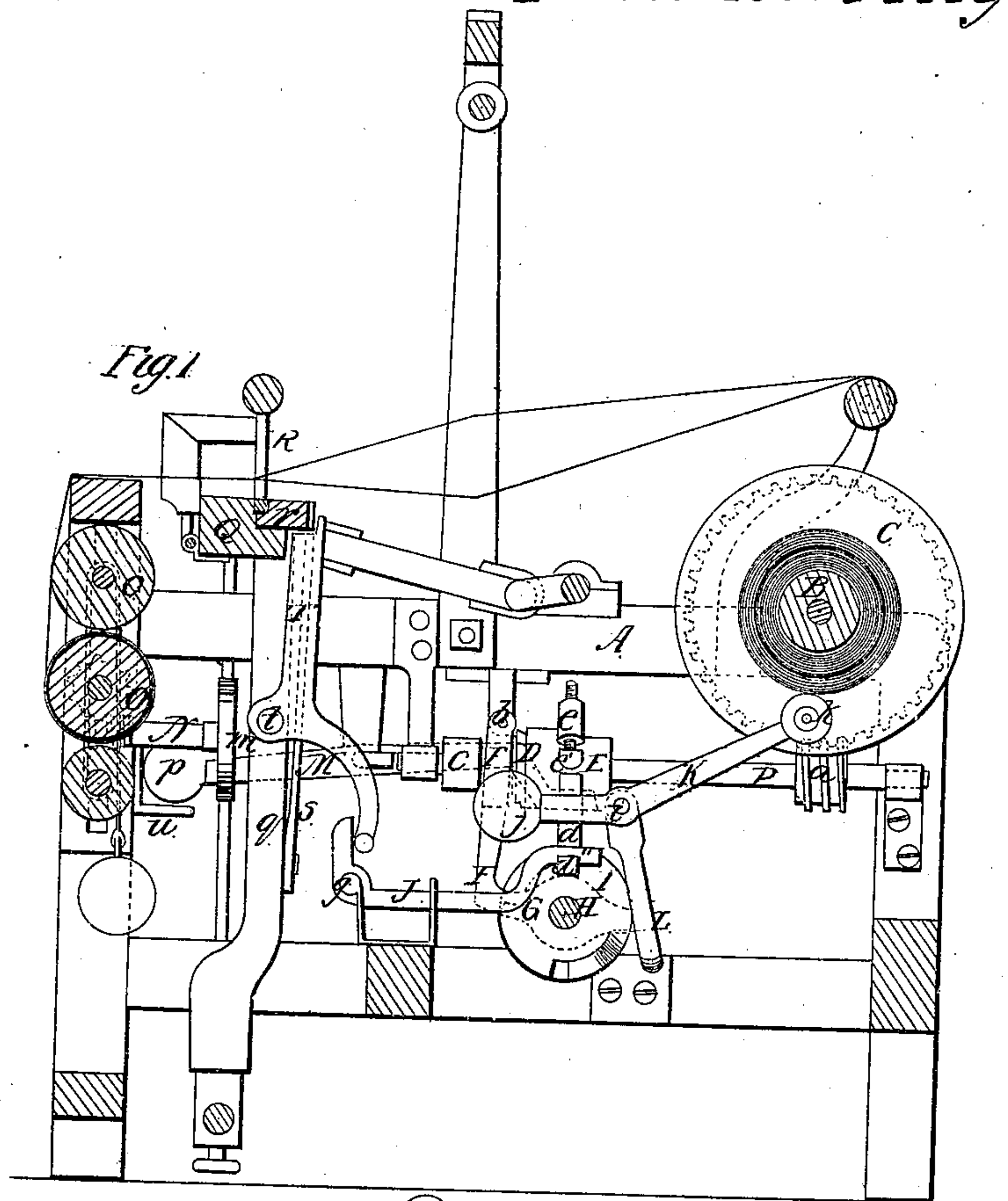


W. H. Gray.
Let-Off for Loom.

N^o 17,926.

Patented Aug. 4, 1857.



UNITED STATES PATENT OFFICE.

WM. H. GRAY, OF DOVER, NEW HAMPSHIRE.

LET-OFF MOTION OF POWER-LOOMS.

Specification of Letters Patent No. 17,926, dated August 4, 1857.

To all whom it may concern:

Be it known that I, W. H. GRAY, of Dover, in the county of Strafford and State of New Hampshire, have invented a new and useful Improvement in the Let-Off Motion of Power-Looms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section taken parallel with the warp of a power loom fitted with my improved let-off motion. Fig. 2 is a side view of the let-off motion looking in the opposite direction to that in which Fig. 1 is seen. Fig. 3 is a back view of the principal parts of the let-off motion.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in certain novel means of effecting and controlling the letting off of the warp, whereby the quantity let off is made positive and unvarying notwithstanding the constant variation in the quantity on the yarn beam, and therefore a uniform tension of the warp is maintained.

A, is one of the side frames of the loom.

B, is the yarn beam having at one end a worm wheel C, geared with an endless screw α , on a horizontal shaft P, which is arranged in suitable bearings parallel with the sides of the loom. This shaft is fitted with a friction clutch D, E, of which the part D, is fitted to the shaft with a feather and groove so as to be capable of sliding longitudinally on but only turning with the shaft, and the other part E, is fitted to turn freely on the shaft.

The part D, of the clutch, is connected with a lever F, of the second order whose upper end is attached to a stationary fulcrum pin b , and whose lower end is caused by a spring that is concealed within a box c , on the shaft to keep in proximity to the peripheral surface of a double cam G, on the treading shaft H. The part E, of the clutch has attached to it three arms d , e , f . The arm d , has a projection d' , which faces a double cam I, on the shaft H, and on the other side a latch d'' , over which is situated the rear end of a bent lever J, of the first order which works on a stationary fulcrum pin g . The arm e , is fitted with a screw e' , which is situated above the front arm of a lever K, of the first order which works on

a stationary fulcrum i , secured in a bracket L, that is bolted to the frame A. This lever has a weight j , attached to its front end, and at the other end has attached to it a roller k , which rests against the warp yarn on the under side of the yarn beam, as shown in Fig. 1. The arm f , is situated above the rear extremity of a lever M of the first order which works on a stationary fulcrum l . The front arm of this lever M, which has a weight attached to it is arranged to act as a pawl on a ratchet wheel m , secured upon the rear end of a horizontal shaft N, which is arranged in suitable bearings parallel with the frame E, and has at its front end an endless screw n , which gears with a worm wheel o , on one end of the take up roll O.

Q, is the lay.

R is the reed the lower rail r , of which is fitted to the lay so as to be capable of swinging back and attached by springs S, S, to the lay swords q , q .

T, is a bent lever of the first order working on a fulcrum t , secured in one of the lay swords, having its upper end attached to the rail r , and its lower end so arranged behind the upright front arm of the lever J, that, by the motion of the lay alone, the said lower end would not be caused to touch or at least not to move the lever J, but that by the slight swinging back of the reed that is permitted by the springs S, S, when the weft is beaten up the said lever T, is caused to throw forward the upright arm of the lever J, and raise the rear end thereof.

The operation is as follows: Every time the lay moves forward the cam I on the treading shaft H acts upon the part E of the clutch to turn it a little way in the direction of the arrow shown upon it in Fig. 3, and at that time the part D of the clutch is held in contact with the part E, by the action of the spring in the box c , which produces sufficient friction between D, and E, to cause the latter to turn the former and with it the shaft P, thus causing the endless screw α , to operate upon the wheel C, to turn the yarn beam to let off the warp yarn. By this movement of the part E of the clutch the latch d'' , is caused to pass the lever J, and be retained by said lever after the offset of the cam I, passes the arm d , thereby preventing the part E, of the cam returning before the clutch is uncoupled and thereby drawing back the shaft and causing the yarn

letoff to be taken back again. Before the
 lay completes its forward movement, the
 cam G, by its action on the lever F, to which
 the part D, of the clutch is attached, moves
 5 the said part D, out of contact with the part
 E, and leaves the latter free to move back
 in the opposite direction to the arrow shown
 in Fig. 3. When the liberation of the latch
 10 d'' , from the lever J, is effected by the lift-
 ing of the said lever above the point of the
 said latch by the action of the lever T, on
 the upright part of the lever J, as the reed
 beats up the filling. The moving back of
 15 the part E, of the clutch is effected by the
 weight of the arms d , e , and is stopped by
 the screw e' , on the arm e , which drops
 on to the lever K. As the lay commences its
 backward movement the offset of the cam
 20 G, passes the lever F, and allows the part E,
 of the cam to be thrown into contact with
 the part D, by the spring in the box c , so
 that as the cam I, comes into operation upon
 the arm d , with the next forward movement
 25 of the lay the shaft P, will be again turned
 to operate on the yarn beam to let off the
 yarn. The same operation takes place at
 every movement, forth and back, of the lay,
 and every time the part E, of the clutch is
 30 turned by the cam I, in the direction of the
 arrow shown in Fig. 3, the arm f , is caused
 to depress the rear end of the lever M, and
 thus raise the opposite end of the said lever,
 which, working as a pawl into the teeth of
 the ratchet wheel M, turns the said ratchet
 35 wheel and with it the shaft N, and endless
 screw n , which acting on the wheel O, turns
 the take up roll and takes up the cloth. The
 amount of "let off" is regulated uniformly
 40 by the screw e' , and the lever K, the weighted
 end of the latter being raised higher or lower

according as there is more or less yarn upon
 the beam D, to hold down the roller K, and
 thus permitting a less or greater movement
 of the part E of the clutch and consequently
 of the shaft P, whose movement in the other 45
 direction always ceases in an unvarying po-
 sition.

The movement of the take up is not varied
 by the variation that is effected in the move-
 ment of the shaft P by the action of the 50
 lever K, as the lever M, is arranged so as
 not to be struck by the arm f , till after it
 has performed that part of its movement
 during which any variation takes place.
 This lever comes to rest with its weighted 55
 end on a stop u , attached to the frame A.
 The amount of let off can however be di-
 minished or increased by screwing the screw
 e' , upward or downward in the arm e .

What I claim as my invention and desire 60
 to secure by Letters Patent is—

1. The combination of the shaft P, the
 endless screw and worm wheel a , and C, or
 their equivalents; the friction clutch D, E,
 the arms d , e , attached to the friction clutch, 65
 the lever F, the cams G, and I, and the lever
 K, the whole arranged, applied and oper-
 ating substantially as herein set forth for
 the purpose specified.

2. The combination of the latch d'' , at- 70
 tached to the loose portion E, of the fric-
 tion clutch, the levers J, and T, operating
 as described to detain and liberate the said
 portion of the clutch substantially as and
 for the purpose set forth.

WM. H. GRAY.

Witnesses:

ANDREW C. CHESLEY,
 JOHN W. KINGMAN.