

W. H. Gray.

Let-Off for Loom.

N^o 965.
31,969.

Patented Apr. 9, 1861.

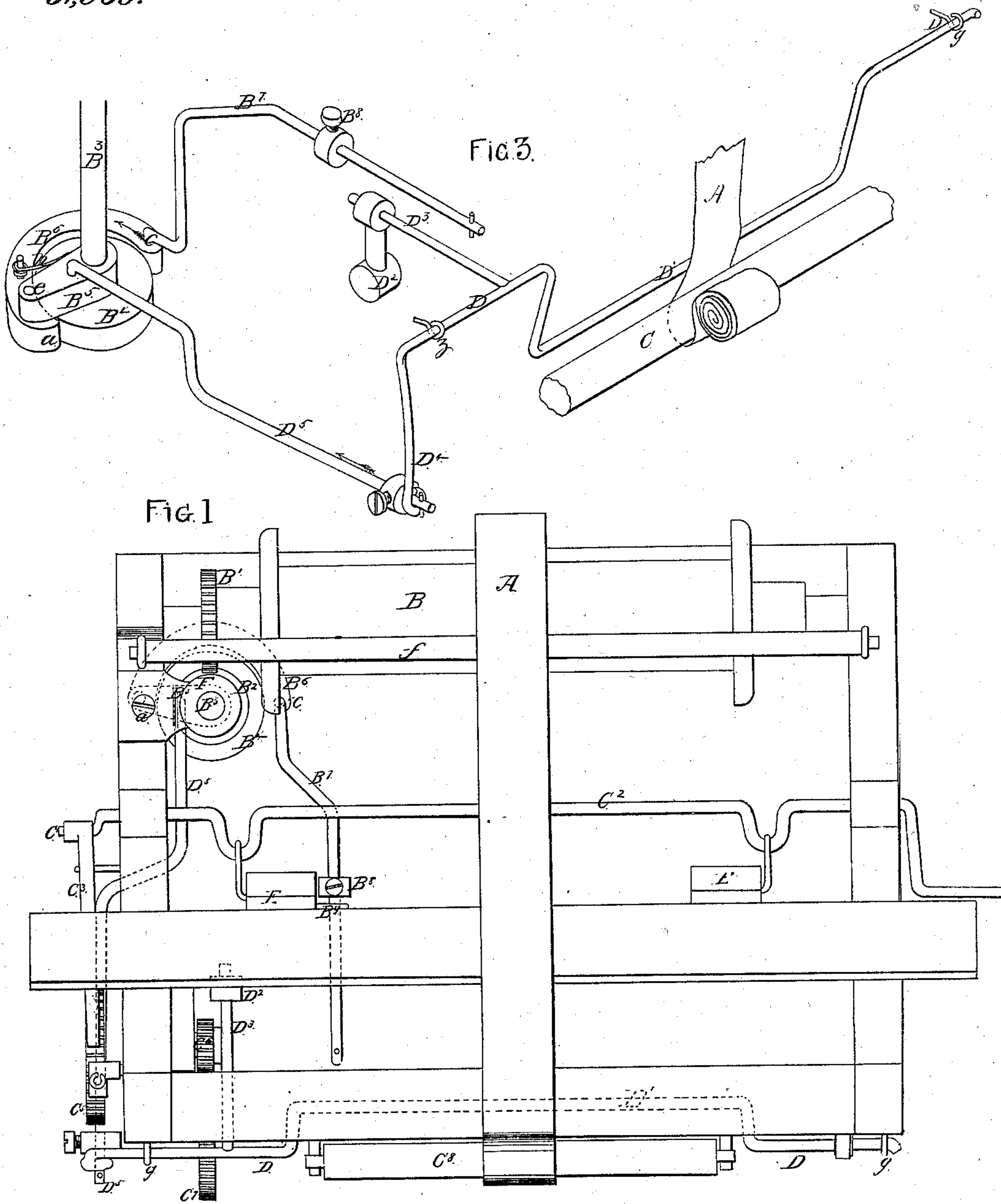


Fig. 1

Witnesses:

Thos. P. Roach
D. C. Lechman

Inventor
Wm H Gray
by his attorney
Sam Cooper

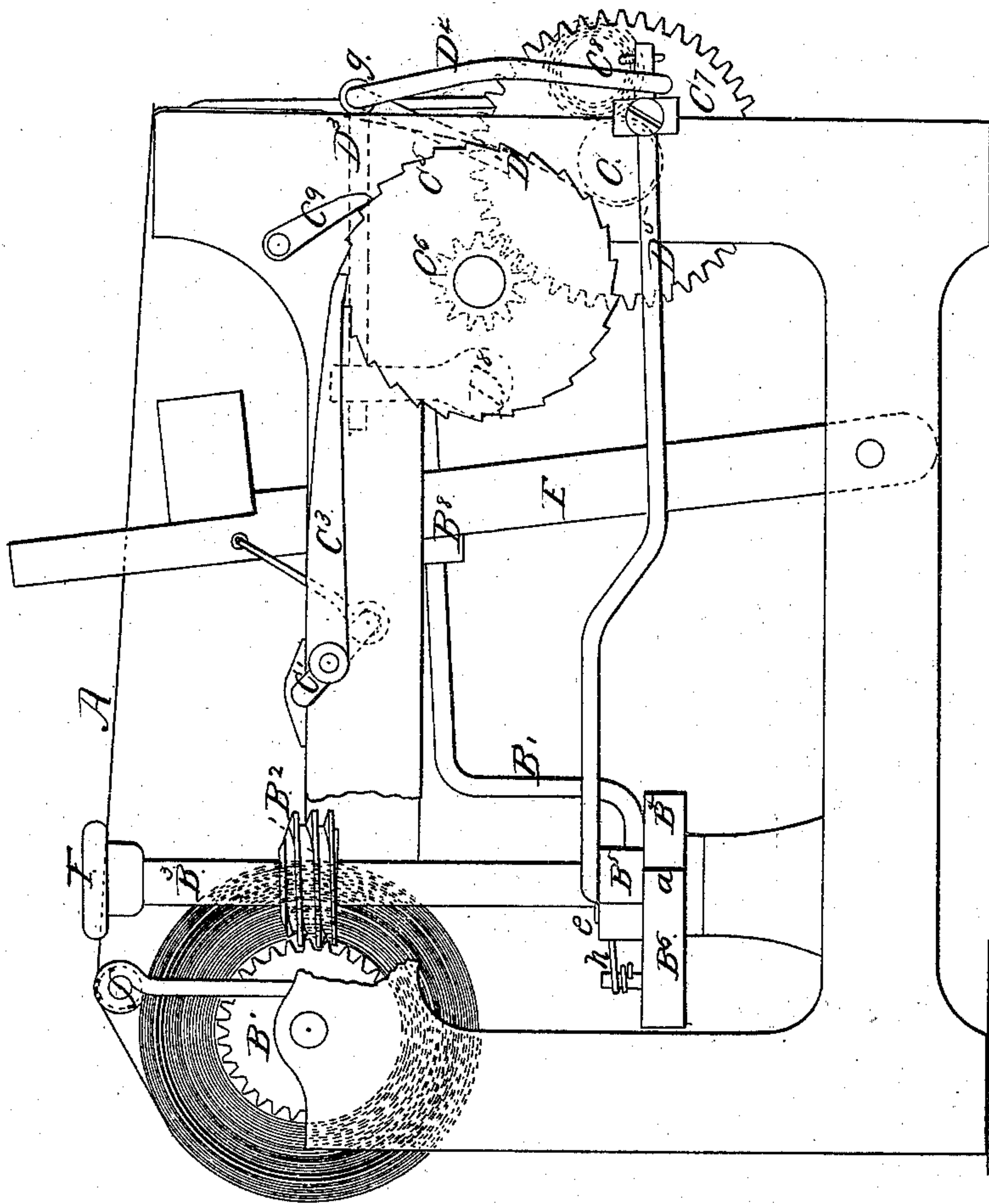
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Fig. 2.



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Thos. R. Roach
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UNITED STATES PATENT OFFICE.

WILLIAM H. GRAY, OF DOVER, NEW HAMPSHIRE.

LET-OFF FOR LOOMS.

Specification of Letters Patent No. 31,969, dated April 9, 1861.

To all whom it may concern.

Be it known that I, WM. H. GRAY, of Dover, in the county of Strafford and State of New Hampshire, have invented a new and Improved Let-Off for Looms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan, Fig. 2 an end view, Fig. 3 details of the let off motion detached from the loom.

The delivery of the yarn from the beam is governed entirely by the tension of the warps, and is effected by the return motion of the lay independently of the mechanism which effects the take up, except that the latter is effected by the forward beat of the lay.

In the accompanying drawings A are the yarns which proceed from the beam B over the whip roll *f* to the weaving point; the woven cloth passing in the usual way over the breast beam to the take up roll C. The latter roll is operated positively by means of a crank C' upon the lay shaft C² which crank carries a pawl C³ by the vibrations of which the intermittent rotary motion is communicated to the ratchet wheel C⁵, the arbor of which carries a pinion C⁶ which engages with a gear C⁷ upon the arbor of the take up roll or cloth beam C. This roll is roughened and the cloth after passing nearly once around is wound upon the roll C⁸, the axles of which rise in slotted guides in the customary manner as the cloth upon the roll accumulates. Any return motion of the cloth beam is prevented by the retaining pawl C⁹. The yarn beam B carries at one extremity a gear B' which engages with the worm B² upon the upright shaft B³ to the bottom extremity of which is secured a circular disk B⁴ immediately above which is an arm B⁵ which fits snugly though not tightly upon the shaft and works freely around it. From the arm B⁵ is suspended a curved clamp or jaw B⁶ which works freely around the pin *e* as a center. The interior of the jaw B⁶ is curved to correspond nearly to the circular exterior of the disk B⁴, so that it may be moved freely around the disk when its ends are left free. The jaw is also so hung at *e* that if it be held from moving at this point while its opposite extremity is moved in the direction of the arrow (Fig. 3) the extreme end or nose *a* of the jaw will bind upon the circumference of the disk B⁴, and then upon

further motion in the same direction the disk will be carried with the jaw and a rotary motion to a certain extent will be imparted to the shaft B³, which, through the connections already explained, will turn the yarn beam and let off a certain amount of yarn; the amount of yarn let off being dependent upon the position of the nose *a* at the moment when it is caused to grip the disk.

To the inner extremity of the jaw B⁶ is attached at *c* a bent rod B⁷ of the form seen in Fig. 3, which carries an adjustable stop B⁸, against which one of the swords of the lay strikes upon its return motion and after each beat. It will be seen on inspection of Fig. 3 that on the inner end of the jaw B⁶ being thrown back by the blow of the lay upon the stop B⁸ if the jaw be left free at the opposite extremity *a* it will simply swing around carrying the arm B⁵ with it, but that on the motion of this arm being checked any further motion of the jaw in the direction of its arrow will cause it to grip the disk and carry it with it. This gripping of the disk B⁴ by the jaw at the exact moment required to give off the required amount of yarn after each beat of the lay, is effected in the following manner.

D is a rod which I term the tension indicator and which is of the form seen most clearly in Fig. 3. At *g* it is allowed to turn freely or pivot in bearings secured to the framework, the bent portion D' pressing upon the woven cloth with a force determined by the adjustable weight D² upon the arm D³ projecting from the rod. At D⁴ the rod is bent downward and is jointed to a rod D⁵ the other end of which is jointed to the arm B⁵.

The operation of this mechanism is as follows: The weight D² is adjusted upon its rod D³ so as to produce the required tension upon the warps, the cloth is then wound upon the roll C⁸ until the arm D³ is horizontal, or this may be effected by turning the shaft B³ by means of the hand wheel F. On the lay making its forward beat the cloth is taken up a certain amount and the warps are thereby strained. This turns the rod D in its bearings and throws the rod D⁵ in the direction of its arrow, which also carries back the arm B⁵ in the same direction and holds it at the point determined by the tension of the warp. On the return motion of the lay the eye B⁹ upon the sword E

strikes against the stop B^8 and carries the jaw B^6 in the direction of its arrow. The pivot e being held stationary as before explained by the tension of the warps, the first motion of the jaw B^6 causes its nose a to bind against the disk B^4 whereby the disk is rotated by the further motion of the jaw. For the more perfect operation of the loom, the nose a of the jaw may be kept constantly in contact with the disk by a spring h , one end of which is attached to the jaw while the other bears upon the arm B^5 . This I have not found to be necessary in most cases.

It is obvious that the above described mechanism will let off an amount of yarn after each beat of the lay exactly equal to the amount which was taken up by that beat, and that the tension of the warps will always be the same at the moment when the lay beats up.

In the machine represented in the drawings the arm D^4 is connected permanently to the rod D^5 ; in practice however there should be an adjustment somewhere between the rod D and the rod D^5 . Any positive take up may be employed in place of the one described, and it is evident that the form of the parts may be varied without departing from my invention, and the same is also true of the relative position of many of the parts, for instance, it matters not on which side of

the cloth the rod D bears, whether front or back, and whether the portion D' bends up or down provided the connections between this rod and the let off be suitably varied to correspond with this change. The strain may even under certain circumstances be taken from the warps back of the lay, but this will manifestly be inferior to the method of taking it from the cloth as the warps are subjected to the vibration occasioned by the beat of the lay. In practice it is found well to put sufficient friction upon the disk B^4 or upon some other attachment to the shaft B^3 to prevent any frivolous motion of the yarn beam. It is also obvious that the weight D^2 may be replaced by a spring without altering the spirit of my invention.

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

The combination of the balanced rod D , the arm B^5 , disk B^4 and jaw B^6 or their equivalents for determining the tension under which the loom shall operate and the amount of let off to be effected after each beat of the lay.

WM. H. GRAY. [L. s.]

Witnesses:

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ALONZO WAIT.