

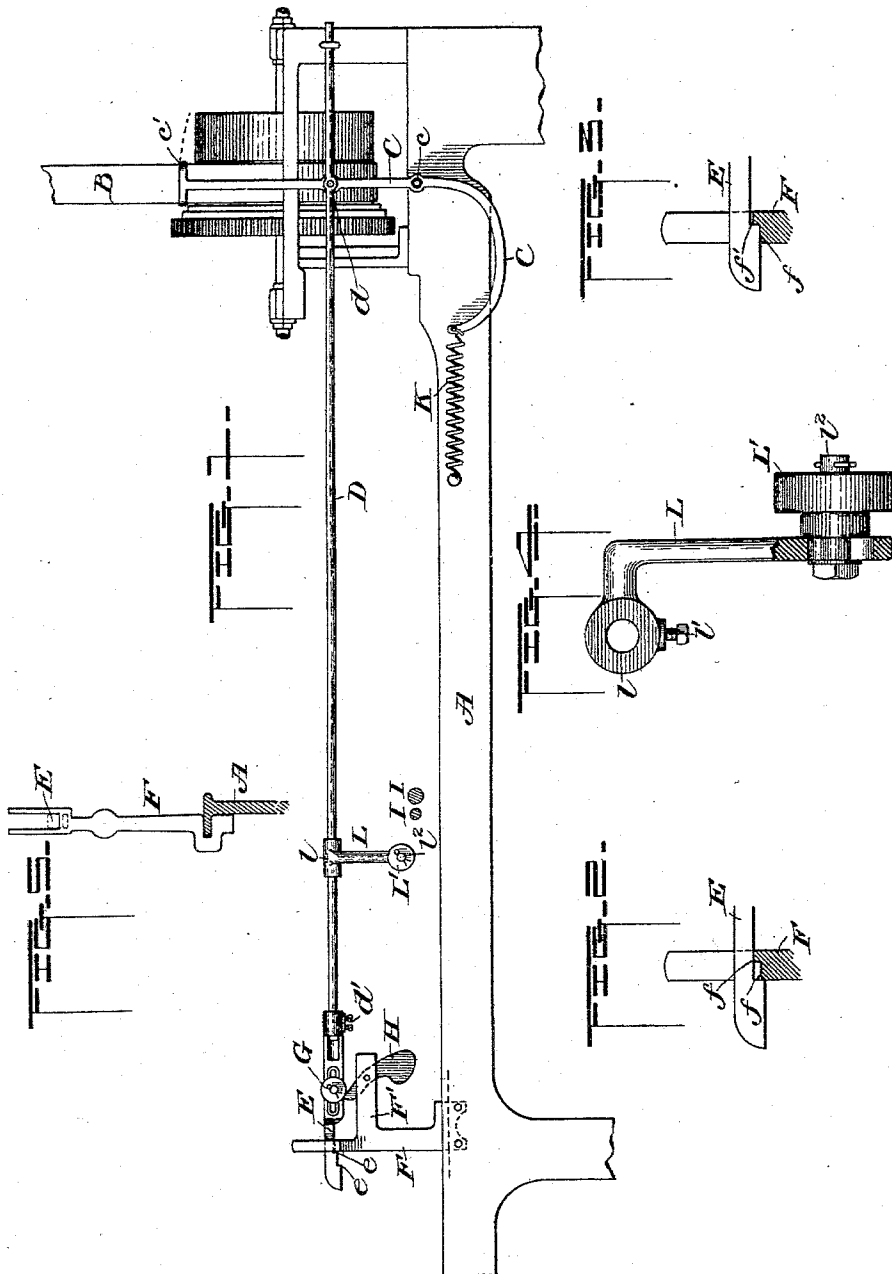
(No Model.)

E. P. COLBY.

BELT SHIFTING DEVICE FOR SELF ACTING MULES.

No. 556,918.

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Witnesses
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UNITED STATES PATENT OFFICE.

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BELT-SHIFTING DEVICE FOR SELF-ACTING MULES.

SPECIFICATION forming part of Letters Patent No. 556,918, dated March 24, 1896.

Application filed November 1, 1895. Serial No. 567,590. (No model.)

To all whom it may concern:

Be it known that I, EUGENE P. COLBY, a citizen of the United States, residing at Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Belt-Shifting Devices for Self-Acting Mules; and I do 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to self-acting mules for spinning; and it consists in an improved belt-relieving motion, as hereinafter set forth and particularly pointed out in the claims.

In all self-acting mules there is a belt-shipping mechanism which automatically throws the belt from the fast pulley to the loose pulley when the mule-head has advanced to the full extent of its movement, in order to allow the mule-head to return. The belt is about five inches wide, and when it is shifted this entire distance at one stroke a heavy strain is put upon it, resulting in frequent breakages, repairs and renewals. If the belt is shifted slowly there is considerable loss of time.

The object of my invention is to enable the belt to be shifted without loss of time and without undue strain.

In the drawings, Figure 1 is the side elevation of the head-stock of a self-acting mule. Figs. 2, 3, 4, and 5 show details of construction which will be hereinafter described and explained.

Supported on the frame A is the mechanism for shifting the belt B from one pulley to the other. This mechanism comprises the lever C, fulcrumed at *c* and carrying the fork *c'*. A shipping-rod D is pivotally connected with the lever at *d* and extends to the other end of the head-stock, where it carries a latch E adapted to engage with a catch F composed of an upright or standard bolted to the frame A and having a bifurcated upper end to receive the latch, as shown in Fig. 5. The latch is adjustably attached to the rod D by means of set-screws *d'*, and has in it a horizontal slot

to permit the adjustment therein of the stud on which is mounted the roller G. The standard F has an arm F' which projects horizontally under the latch E, and in said arm is pivoted a tripping-lever H, on the upper end of which rests the roller G.

At I I are shown in cross-section the followers or transverse shafts of the mule-head, which at the end of the movement of said head strike the tail of the tripping-lever H and cause it to lift the roller G and latch E, disengaging the latter from the catch F and permitting a spring K, attached at one end to the frame A and at the other to the lower end of the lever C, to pull said lever to one side, thereby throwing the belt B over to the loose pulley. This mechanism is all old and in common use.

My improvements consist in making the latch E or the catch F with two or more steps or shoulders *e* or *f*, so that the disengagement of the latch may not take place all at once, but may be done gradually and by degrees, thus allowing the belt to shift only a part of its full width at each release of the latch.

In order to lift the latch only enough to disengage one of the steps *e*, I attach to the shipping-rod D a depending arm L, preferably by providing said arm with a sleeve *l*, to encircle the rod, and a set-screw *l'* to fasten it at any desired point thereon. At the lower end of the arm is a lateral stud *l''*, on which is mounted a roller *L'*, as shown in Fig. 4. The arm is slotted to permit a vertical adjustment of this roller, which is set at such a height that the followers I I will strike and raise it just far enough to lift the latch the depth of the first step *e* or *f*. The spring K will then partially shift the belt, the amount of movement depending upon the horizontal distance between the steps. If there are more than two steps, two or more arms L must be used, one behind the other. When only one is used, it is preferably so set as to partially shift the belt when the mule-head is about six inches from the end of its stroke. The completion of the shifting is effected by the followers striking the tripping-lever H, as usual.

Instead of making the catch with two or more steps *e* I may use the ordinary latch and provide the catch F with two or more

steps or shoulders f , as shown in Figs. 2 and 3, the horizontal distance between them governing the amount the belt will shift at each successive lifting of the latch.

5 It will be seen that my invention relieves the belt from excessive strain by distributing the shifting into two or more periods; but I also save in time, because all but the last movement of the belt is done before the mule-head reaches the end of its stroke, so that the
10 final movement of the belt can be quickly and easily effected. The saving in time on each motion is slight, it is true, but it amounts to considerable in the course of a day, since the
15 latest machines of this class are built to run at high speeds.

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

20 1. A self-acting mule provided with automatic belt-shifting mechanism and means for causing said mechanism to effect the shifting of the belt in two or more distinct movements or periods, substantially as described.

25 2. The combination with the automatic belt-shifting mechanism of a self-acting mule, of a releasing device therefor having two or more distinct movements in effecting a complete release, substantially as described.

30 3. The combination with the automatic belt-shipping mechanism of a self-acting mule, of a releasing device operating to effect a partial shifting of the belt before the mule-head reaches the end of the stroke,
35 substantially as described.

4. The combination with the automatic

belt-shipping mechanism of a self-acting mule, of an auxiliary releasing device operating to partially shift the belt before the final shifting takes place, substantially as
40 described.

5. In a self-acting mule, the combination with the automatic belt-shipping mechanism, of a detent device for the shipping-rod having two or more steps or shoulders, substan-
45 tially as described.

6. In a self-acting mule, the combination with the automatic belt-shipping mechanism, of a detent device for the shipping-rod having two or more steps or shoulders, and an
50 arm on said rod adapted to be engaged by the followers to partially disengage the detent, substantially as described.

7. In a self-acting mule, the combination with the belt-shipping rod, of a detent hav-
55 ing two or more steps or shoulders and an adjustable depending arm carrying a vertically-adjustable roller, substantially as described.

8. In a self-acting mule, the combination 60 with the belt-shipping rod, of a latch having two or more steps or shoulders, and a depending arm carrying a roller and having a sleeve adjustable on said rod, substantially
as described.

In testimony whereof I affix my signature in presence of two witnesses.

EUGENE P. COLBY.

Witnesses:

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CHARLES E. FOOTE.