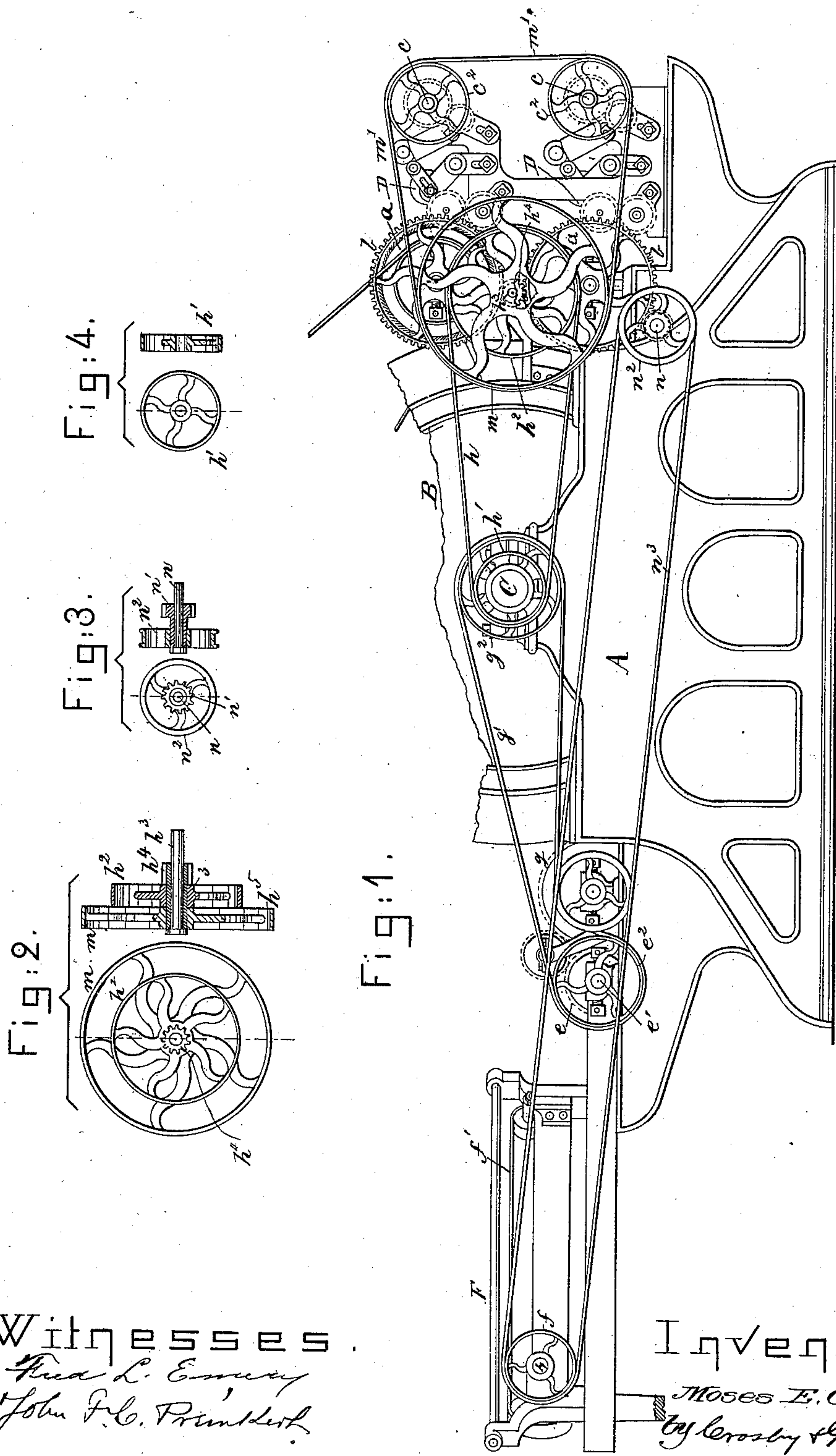


(No Model.)

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CONDENSING CARDING MACHINE.

No. 373,137.

Patented Nov. 15, 1887.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## CONDENSING CARDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,137, dated November 15, 1887.

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*To all whom it may concern:*

Be it known that I, MOSES E. GEORGE, of Lebanon, county of Grafton, State of New Hampshire, have invented an Improvement in Condensing Carding-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The Lucas condenser (shown in United States Letters Patent No. 143,020, dated September 23, 1873) is in practice applied to an ordinary wool-carding machine having at its receiving end a feed of the class known as the "Apperly and Clissold feed," substantially such as shown in United States Letters Patent No. 18,888, dated December 22, 1857, and well known and in common use. The condenser is also used with carding-machines having other kinds of feeding mechanism.

In a carding-machine having Lucas condensers such as referred to it is frequently necessary to change the speed of the main cylinder, in order that the carding-machine shall not deliver sliver faster than the spinning-machines can take care of it, or so slow as not to supply sufficient sliver for the spinning-machines; and so, also, at times, owing to change in stock, it is frequently necessary for good and proper work to change the speed of the usual doffers. A change in the speed of the doffers necessitates a corresponding change in the speed of the drawing-off rolls which take the slivers from the condensers, and also of the shaft which actuates the feeding mechanism employed to automatically feed the main cylinder with slivers.

In carding-machines having condensers of the Lucas class, as now in common use, and wherein the wool is fed automatically, the axis of the main cylinder is provided with a pulley, which by a belt is connected with a pulley attached to a shaft having a small toothed wheel, which engages and drives the toothed gears on the shaft of the two usual card-clothed doffers, and a second pulley on the shaft of the main cylinder, and at the same end thereof, drives a second belt, which is extended over the pulleys on the shafts which draw the slivers from the Lucas condensers, and a third pulley on the end of the rotating lick-in shaft, driven also by a belt on a pul-

ley fast on the main shaft of the card, carries a belt, which is extended over the main driving-pulley of the Apperly and Clissold feeding mechanism. In this old plan the doffers and drawing-off rolls of the condenser are driven by separate pulleys and belts from the shaft of the main cylinder, and have no connection each with the other, except through the main shaft; nor have they any connection with each other or with the devices which drive the main shaft of the Apperly and Clissold feeding mechanism in such manner that a change on the main shaft of the card of one of the pulleys which drives one of the said parts will affect or alter the speed of the other in a corresponding ratio. So it will be understood that when any change in the relative speeds of the said parts is needed it is necessary to change three pulleys; and it will also be understood that if the speed of the doffers is increased or decreased the speed of the drawing-off rolls of the Lucas condenser mechanism, as well as of the feed for the carding-cylinder, must also be changed to insure the same relative speed of the feed, doffers, and drawing-off rolls on the one part with relation to the speed of the carding-cylinder, such change being necessary to properly adjust the speed to the requirements of the spinning-machine or the yarn to be made; and when the several pulleys referred to have been changed it frequently happens that the carding-machine has to be run experimentally to test the sliver delivered and see if it comes up to the proper standard or requirements.

The object of my invention is to drive the doffers and the drawing-off rolls of the condenser from one pulley on the main shaft of the card, so that change of that one pulley will affect the speed of both the doffers and the said drawing-off rolls of the condenser in unison; and I have also provided gearing, so that the feed may also be driven in unison with and by gear set in motion by the doffer, rather than, as heretofore, by a belt from the lick-in shaft.

In accordance with my invention the change of one pulley on the main shaft will alter the speed of the doffers, the drawing-off rolls of the condenser, and the feed, moving each proportionately faster or slower.

Figure 1 represents a partial side elevation of an ordinary carding-machine (of the class



referred to) with my improvements added, to enable my invention to be understood, the pulleys shown in Fig. 2 being partially broken out to show the frame and doffer-gears behind them; and Figs. 2, 3, and 4 details of gearing or parts devised by me, separated from the rest of the machine, of ordinary construction.

Referring to the drawings, the frame-work A, the main cylinder or case B, the main shaft C, the two doffers *a a*, the toothed gears *b b* on their shafts, the shafts *c c* of the drawing-off rolls, the Lucas condenser, represented by D, the belt-pulleys *c<sup>2</sup>* on the said shafts *c*, the lick-in *e*, its shaft *e'* and pulley *e<sup>2</sup>*, and the shaft 4, the carrier-belt *f'*, both common to the Apperly and Clissold feeding mechanism, and the first worker, *g*, belt *g'* to drive it and the lick-in, and the pulley *g<sup>2</sup>* on the main shaft are all as usual in machines of this class, and are not of my invention.

In my improved machine the belt *h*, driven by the pulley *h'* on the main shaft C, drives the pulley *h<sup>2</sup>*, secured on a sleeve, 3, (see Fig. 2,) placed loosely on a stud, *h<sup>3</sup>*. The said sleeve and pulley have connected to and moving with them a small pinion, *h<sup>4</sup>*, which engages with the doffer-gears *b b* and drives the doffers.

In the old form of machine referred to a pulley on the main shaft was employed to drive a belt extended over a pulley, having an attached pinion, substantially such as just referred to, to drive the doffers.

In the old form of machine a second pulley on the main shaft C drove a belt which was extended directly over the two pulleys *c<sup>2</sup> c<sup>2</sup>*, to drive the drawing-off rolls of the usual Lucas condenser mechanism.

Herein I have provided the sleeve 3 and pinion *h<sup>4</sup>* with a second pulley, *m*, or through the said sleeve, as herein shown, I have connected with the said pulley *h<sup>2</sup>* a pulley, *m*, so as to be moved in unison with it. This pulley *m*, moved in unison with the pulley *h<sup>2</sup>*, receives the belt *m'*, which is extended over and drives both of the pulleys *c<sup>2</sup> c<sup>2</sup>* on the shafts *c c* of the drawing-off rolls of the Lucas condensers; and it will be understood that by changing the pulley *h'* on the main shaft for a larger or smaller one the relative change in the speed of the doffers and shafts *c c* with relation to the speed of the main carding-cylinder will be the same in proportion, or the speed of both the doffers and the drawing-off rolls will both be changed by the change of the one pulley instead of two, as heretofore.

To enable the speed of the feeding mechanism F to be changed in unison with the change in the speed of the doffers, I have provided the frame-work with a stud, *n*, on which I have placed a sleeve provided with a small pinion, *n'*, and the said sleeve has connected with it a belt-pulley, *n<sup>2</sup>*. These parts are fully shown detached in Fig. 3. The toothed gear *b* of the lower of the two doffers is made to engage the pinion *n'*, and it, connected as described, or in other usual manner, with the belt-pulley *n<sup>2</sup>*, causes the latter, by belt *n<sup>3</sup>*, ex-

tended over the pulley *f* of the feeding mechanism F, to drive the feed.

The feeding mechanism now in common use has upon the shaft 4 a toothed gear, which is engaged and rotated by an intermediate gear connected with a pulley driven by a crossed belt extended over the pulley at the end of the lick-in shaft; but herein I have dispensed with the said pulley and intermediate, and have removed the said gear from the shaft 4, and instead of the same I have provided the shaft 4 with a belt-pulley, *f*, and I have extended the belt *n<sup>2</sup>* over this pulley *f*. The belt *n<sup>3</sup>* is much longer than the crossed belt dispensed with. In this manner I am enabled to provide means by which to drive the feed for the card-cylinder from the doffer-gearing, so that any change of speed of the doffer with relation to the main cylinder, as stated, will also effect a corresponding proportional change of speed in the feeding mechanism of this particular kind of feeds.

Herein I have not deemed it necessary to fully describe the feeding mechanism, as it is not of my invention, but is well known in all mills as the Apperly and Clissold feed, it acting to lay a roving or sliver diagonally across an endless apron, by which latter the sliver or roving is carried to the lick-in; and I desire it to be understood that by the term "feeding mechanism" I mean to include a feeding mechanism substantially such as referred to.

I have not described in detail the construction and operation of the Lucas condensing mechanism, as it is well understood and not of my invention. That mechanism, well known, contains diagonally-placed revolving disks, between which the slivers are drawn and by which they are condensed, the disks acting upon opposite sides of each of the said slivers being rotated in opposite direction.

Instead of the particular disks used in the Lucas condenser, I intend to include as within the scope of my invention any other well-known form of disks or tube condensers employed in machines containing that class of condensing apparatus.

By my improved devices it is possible to reduce the speed of rotation of the doffers with relation to the main cylinder by changing but one pulley; and at the same time and without further manipulation the speed of the drawing-off roller of the condenser mechanism, and also of the pulley *f* of the feeding mechanism, will be reduced proportionately or correspondingly.

I claim—

1. The main card-cylinder, its shaft, and the single change-pulley *h'*, and the two pulleys *h<sup>2</sup> m* and pinion *h<sup>4</sup>*, driving-pulley *h'* and belt driven thereby and driving the aforesaid pulleys, combined with the doffers, and their toothed gears engaging pinion *h<sup>4</sup>*, and the shafts *c* of the rolls which draw the sliver from the condensers, and a belt, *m'*, connecting the said shafts *c* and pulley *m*, and operating



them in unison with the pulleys  $h^2$  and  $m$ , whose speed is governed by the single change-pulley  $h'$ , as and for the purposes set forth.

2. The gears  $b$  of the doffers and means to  
5 operate them, and the shaft 4 and pulley  $f$  of the feed mechanism, and the gear  $n'$ , pulley  $n^2$ , and belt  $n^3$ , combined and arranged to run the feed and doffers in unison, substantially as described.

10 3. The main shaft, the doffers, doffer-gears, the drawing-off rolls of the condenser, and the feed, combined with the pulley  $h'$  on the main shaft, pulley  $h^2$ , suitably supported on the frame between the doffers, a belt connecting  
15 said pulleys, a pinion driven by the last-named pulley and in turn driving the doffer-

gears, pulleys  $c^2 c^2$  of the condenser, a pulley,  $m$ , connected with pulley  $h^2$ , a belt,  $m'$ , connecting the pulleys  $m$  and  $c^2 c^2$ , a pulley,  $n^2$ , geared with and driven by the lower doffer, a pul- 20 ley,  $f$ , for driving the feed, and a belt,  $n^3$ , transmitting the motion of pulley  $n^2$  to the feed, all arranged to operate, substantially as described, to move in unison the said doffers, drawing-off rolls, and feed.

25 In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MOSES E. GEORGE.

Witnesses:

C. COWEN,  
J. E. DEWEY.