

No. 862,202.

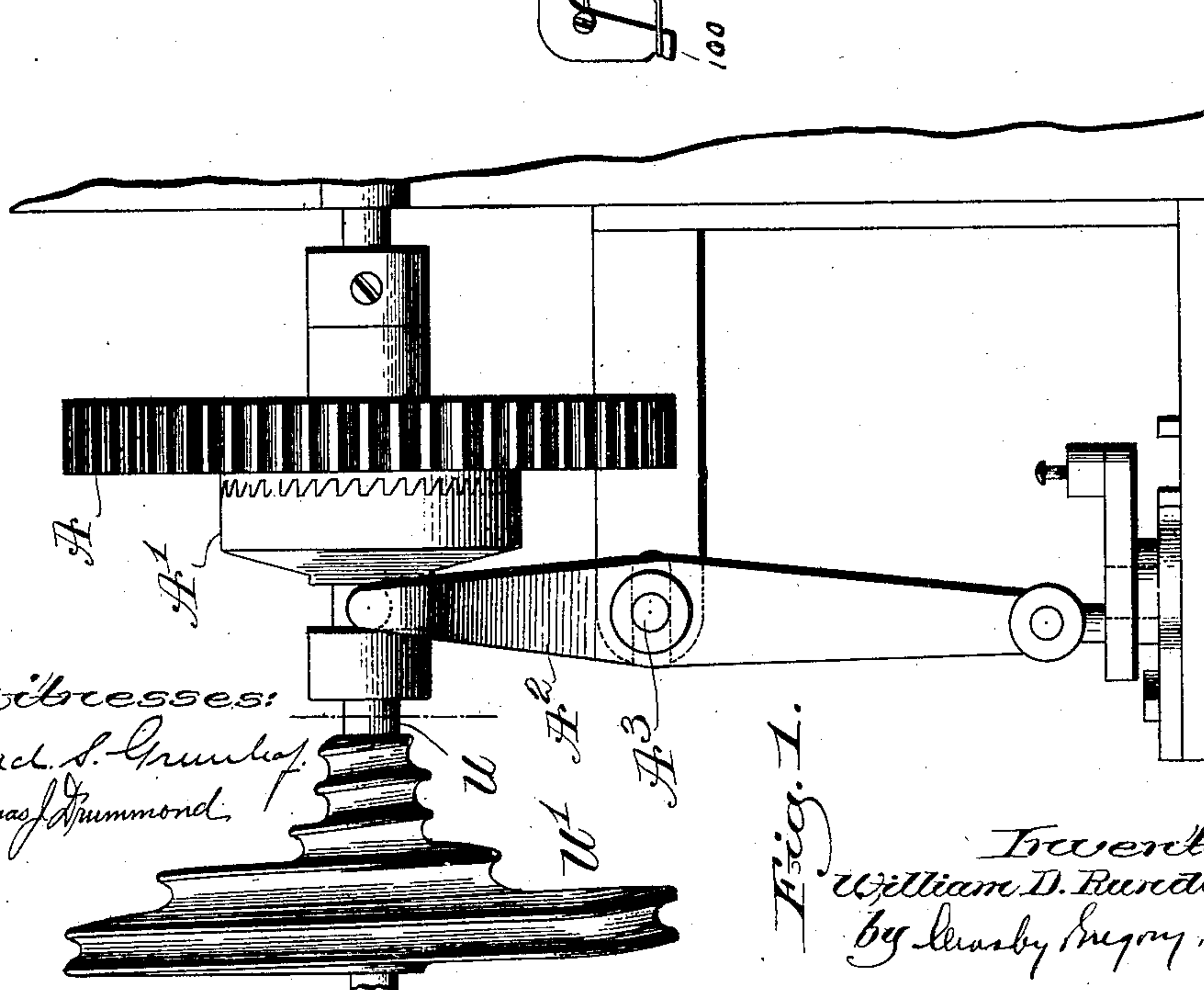
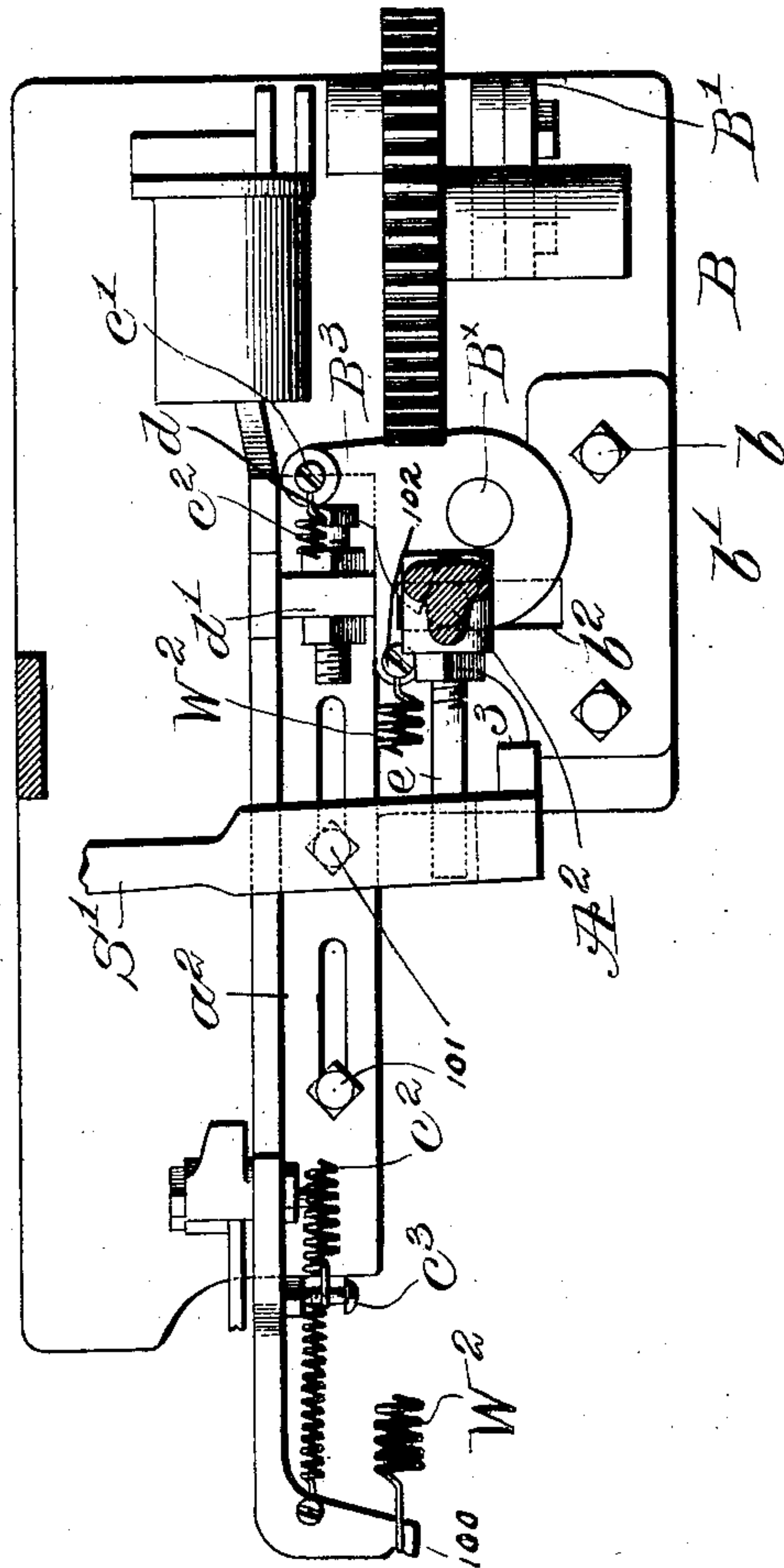
PATENTED AUG. 6, 1907.

W. D. RUNDLETT.  
SPINNING MULE.

APPLICATION FILED SEPT. 13, 1905.

3 SHEETS—SHEET 1.

*Fig. 2.*



witnesses:  
Fred. S. Grunke,  
Thomas J. Drummond,

*Fig. 1.*

Inventor,  
William D. Rundlett,  
by Lewisby Ingham, Attys.

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3 SHEETS—SHEET 2.

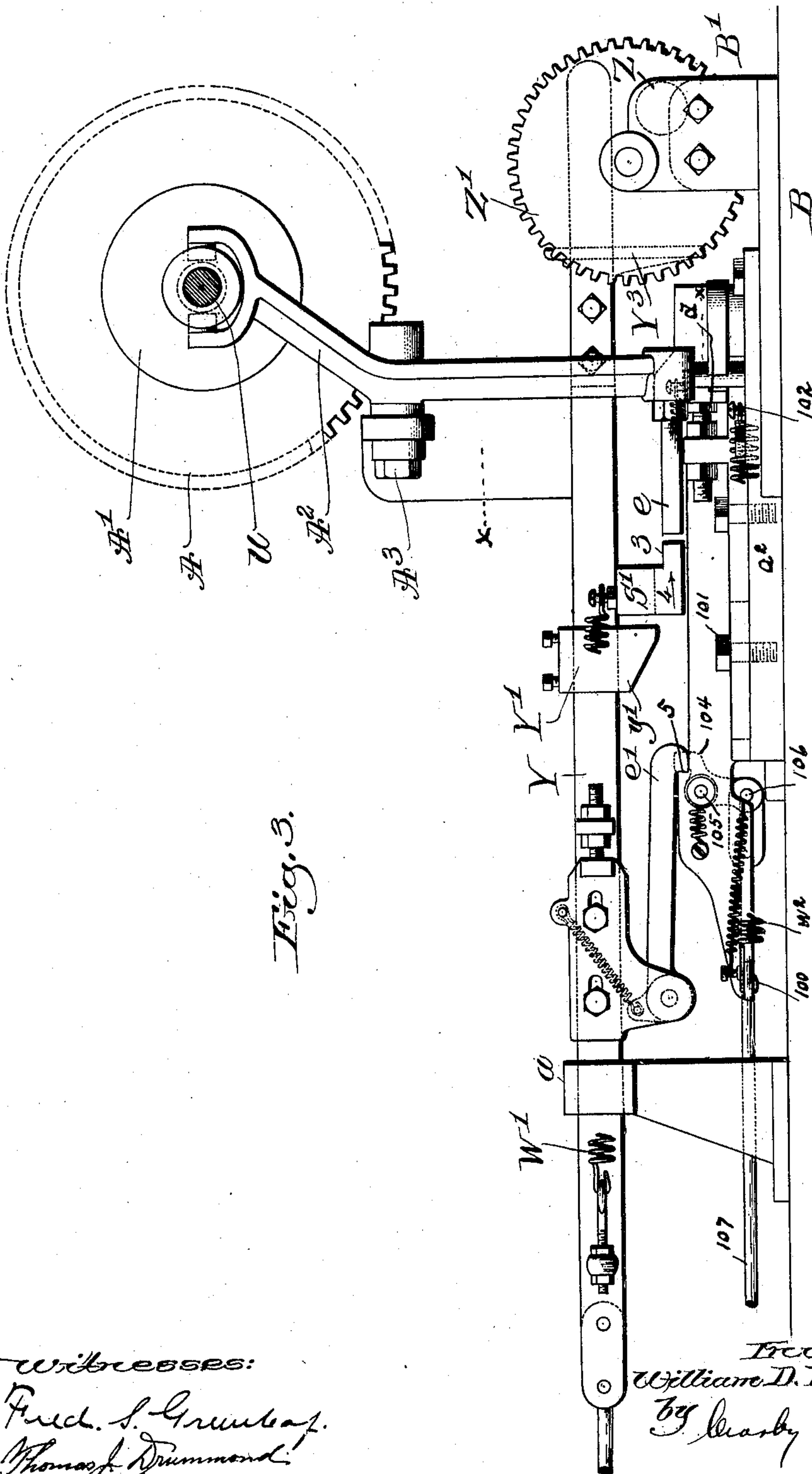


Fig. 3.

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William D. Rundlett,  
by Oscar Gregory,  
Attys.

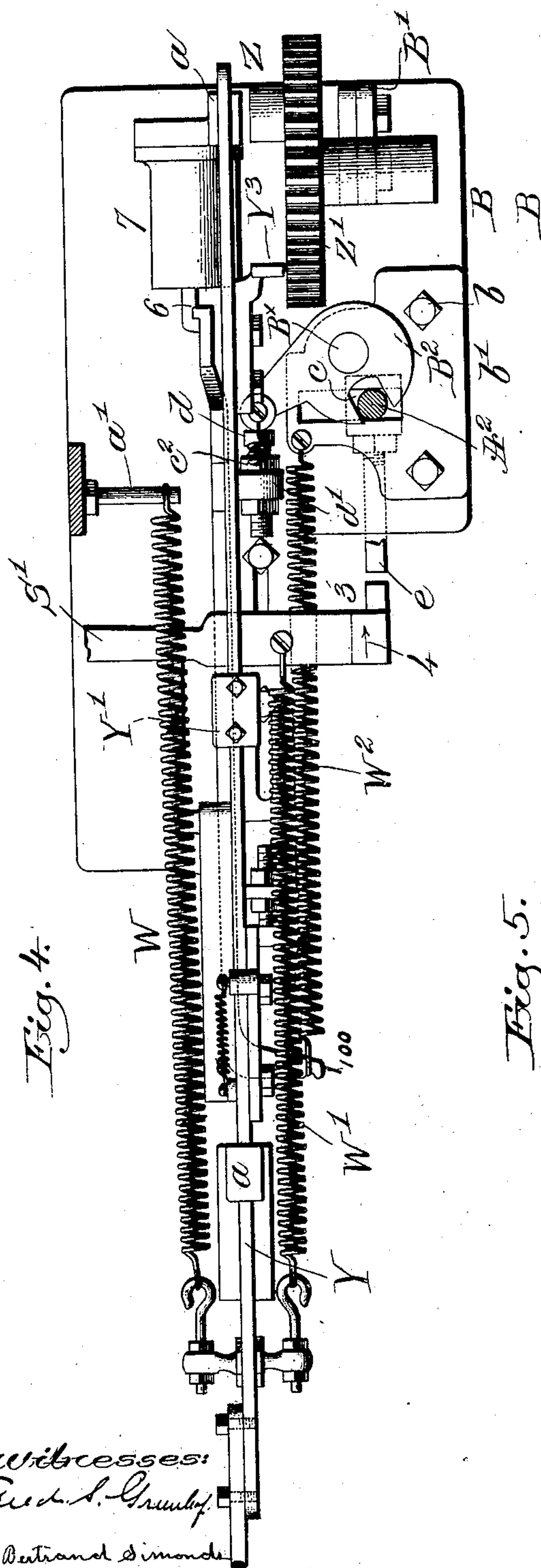
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3 SHEETS—SHEET 3.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## SPINNING-MULE.

No. 862,202.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed September 13, 1905. Serial No. 278,204.

*To all whom it may concern:*

Be it known that I, WILLIAM D. RUNDLETT, a citizen of the United States, and a resident of North Andover, county of Essex, State of Massachusetts, have invented

an Improvement in Spinning-Mules, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawings representing like parts.

This invention relates to means for throwing out and into operation the usual clutch employed for stopping or starting the drawing out scroll shaft of mules of the so-called McGovern type represented in United States Patent No. 193,887, mules such as commonly made by Davis & Furber Machine Company.

In the mule referred to the clutch parts instrumental in starting and stopping the drawing out scroll shaft are opened to stop the rotation of the drawing out scroll shaft by a forked lever acted upon by the inclined point of a sliding frame that is moved forwardly at desired times by a spring, so that said point meets the lower end of said lever and turns the same, and said slide-frame besides turning said clutch-lever has to be moved by a force sufficient to overcome a spring connected with said lever, which spring is employed to move said lever in a direction to engage said clutch. The means referred to for moving said clutch lever to open the clutch necessitates the expenditure of a large amount of power, and to materially lessen the power required to operate the mule, and to gradually reduce the friction of the parts one on the other, I have devised novel means to be herein described whereby said lever may be easily moved with the expenditure of but little power.

In accordance with my invention I have combined with the lower end of said clutch-lever a pivoted actuator shown as mounted on a stud rising from a so-called draft-plate secured to the head-stock and to the floor.

The actuator has a throat in which normally stands the lower end of the clutch-lever, and the actuator as shown has an arm or projection or shoulder that is struck by one end of a slide as the latter is moved by its spring towards the head stock, the movement of the actuator about its pivoted point turning the clutch lever engaged by it and disengaging said clutch from its co-acting member. The draft plate is provided with a guide or slot in which the lower end of the clutch lever below the point where it is embraced by the actuator travels as the clutch lever is turned. This guide aids in keeping the end of the clutch lever in the throat of the actuator.

A strong spring connected with the arm of the actuator turns the latter when the slide referred to is moved in a direction to cause the clutch lever to slide the clutch referred to into engagement to start the drawing out scroll shaft.

The pivoted actuator is one of the chief features of novelty to be herein claimed, and I have provided novel means for moving said actuator.

Figure 1, in front elevation, represents a part of a mule of well known construction sufficient to show the draft-scroll and drawing out shaft and its clutch members; Fig. 2 shows part of the devices, Fig. 5 with the actuator in the position it occupies when the clutch is opened, the actuator at such time being locked; Fig. 3 is a side elevation of the parts comprising my invention; Fig. 4 is a plan view of most of the parts shown in Fig. 3. Fig. 5 is a similar view with some of the parts, Fig. 4, omitted.

Referring to Fig. 1, the draft or drawing-out shaft U, the drawing-out scroll U', the clutch-gear A running loosely thereon, said gear being driven positively through a train of gears (not shown) actuated by the main driving shaft of the mule, located, in practice, thereabove and sustained in the head-stock, and the co-acting clutch-member A' splined on said shaft and free to be moved thereon in the direction of its longitudinal axis to engage the side teeth of the clutch-member A' with the teeth of the gear A constituting the other member of the clutch; the hub of the clutch-member A' having an annular groove that is engaged by the forked upper end of the clutch-lever A<sup>2</sup> mounted on a stud A<sup>3</sup>; the lever S' for engaging the clutches (not shown) for drawing in the usual carriage during winding, said lever being moved at such time by a block Y' attached to a slide-bar Y held loosely in suitable guides a, a, the spring W connected at one end with said bar and at its other end with a stud a' on the head-stock, the projection Y<sup>3</sup> of the slide-bar Y being adapted to be struck by the wrist-pin Z of the gear Z'; the spring W' connecting said slide-bar with said lever, are and may be substantially as represented in said Patent No. 193,887, so need not be herein further more particularly described.

Herein the draft-plate B having the stand B' provided with a bearing for sustaining the gear Z' has secured to it by bolts b a guide-plate b' slotted at b<sup>2</sup> to constitute a guide for the lower end of the clutch-lever A<sup>2</sup>, said guide steadying the clutch-lever in its movements.

The draft-plate is provided with a stud B<sup>x</sup> on which is mounted to turn freely the actuator B<sup>2</sup> constituting one of the essential features of my invention. This actuator has a throat c that embraces the lower end of the clutch-lever close to the upper side of the guide b'.

The actuator B<sup>2</sup> has a projecting arm B<sup>3</sup> having a boss in which is inserted, as shown, a screw c'. The screw referred to has connected with it one end of a spring c<sup>2</sup> the opposite end of which, see Fig. 5, is attached to a screw c<sup>3</sup> extended from the side of the draft-slide near its rear end. Herein I have provided a draft-slide a<sup>2</sup>,



slotted as represented in Fig. 2 and guided in its reciprocations by means of stud screws 101, said slide being provided at its right hand end with an adjustable bunter  $d$ , such as a screw, that may be adjusted in an ear  $d'$  extended from the draft-slide, the bunter being held in its adjusted position by suitable nuts on said screw at either side of said ear.

When the slide  $a^2$  is moved to the right, Figs. 4 and 5, in this instance of my invention through the action of spring  $W^2$ , connected at its outer end, as shown at the left Fig. 2, with a projection 100 forming a part of said draft-slide, the opposite end of said spring being connected with a stud 102 fixed to the framework, this bunter meets the boss or other portion of the projection  $B^3$  of the actuator and turns the actuator about its pivot  $B^X$ , moving the lower end of the clutch-lever to the right, viewing Fig. 1, and disengaging the clutch-member  $A'$  from the positively driven gear  $A$  forming the other member of the clutch. The disengagement of these parts immediately stops the carriage in its extreme outward position, and the movement of the actuator to so move the clutch to stop the carriage is effected easily, and at this time there is no spring connected with the actuator whose force has to be overcome for the reason that the spring  $c^2$  is carried by the draft-slide, and during the time that the draft-slide is moving to the right the spring exerts no strain to retard the easy and free movement of the actuator.

The actuator is turned into the position, Fig. 2, when the carriage arrives at the end of its outward run, at which time the draft-slide is released as usual in mules of this type and is moved forward or to the right by the spring  $W^2$ . As the actuator is moved from the position Figs. 4 and 5, into the position, Fig. 2, the arm  $e$ , projecting from the lower end of the clutch-lever, is moved to occupy a position out of the path of the end 3 of the lever  $S'$ , which lever is moved, at the completion of the backing-off motion, in the direction of the arrow 4, or to the right, Fig. 4, said movement being effected by means of the slide-bar  $Y$  and spring  $W$ . The end of the lever  $S'$ , in the position Fig. 2, therefore, engages and locks the arm  $e$  of the clutch-lever and holds the latter in position to hold the clutch  $A, A'$ , open throughout the inward run of the carriage and the actuator remains locked in the position Fig. 3. As the carriage runs in, the wrist-pin  $Z$  of the gear  $Z'$  meets the portion  $Y^3$  of the slide-bar  $Y$  and moves the same to the left, Figs. 4 and 5, and the hook  $e'$ , see Fig. 3, attached to the slide-bar  $Y$  engages a projection 5 of the draft-slide  $a^2$ , and draws said slide with it in the same direction, thus straining all the springs and causing the bunter  $d$  to retire from its contact with the end of the actuator. As the carriage is running in and the slide-bar  $Y$  is moved to the left, Figs. 4 and 5, the hook there-

of taking with it the draft-slide, the slide-bar is locked in its extreme outward position by any usual or suitable means until after said draft-slide is released, see Fig. 3, by a trip 104 made as an elbow lever pivoted at 105 and connected by pin 106 with a rod 107 extended to the front of the machine, said rod being operated by the carriage at its extreme outward position.

At the extreme inward run of the carriage when the drawing-in clutches are to be released, the lever  $S'$  is moved to the left under the action of the spring  $W'$  to release the arm  $e$ , and unlocks the lower end of the lever  $A^2$ , and by means of it the actuator engaging the clutch-lever, and permits said actuator to be moved by the spring  $c^2$ , the latter moving the actuator from the position, Fig. 3, into the position Figs. 4 and 5, thus again engaging the clutch-part  $A, A'$ , preparatory to drawing the carriage out.

Herein it will be understood that the springs referred to are all set by the movement of the slide-bar through the gears  $Z'$  and these springs are permitted to come into action successively so that no two of said springs act at the same time in opposition as is the case with the springs employed with the slide-bar and draft-slide of said patent.

The right hand end of the draft-slide has a hook 5 that engages a notch in a rod 6 forming part of a piston that enters a cylinder 7, said piston compressing the air in the cylinder and the air acting as a buffer to take up the shock due to the action of the springs, as described.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a mule, a draft scroll shaft, its clutch members, and clutch-operating lever, combined with a pivoted actuator directly engaging the lower end of said clutch lever, and a draft slide having a bunter to directly engage said actuator and turn the latter to move said clutch lever to disengage the clutch.

2. In a mule, a draft scroll shaft, its clutch members, a clutch lever, a pivoted actuator presenting a throat and a projecting arm, said throat engaging the lower end of said clutch lever, and a draft slide, combined with means to move said draft slide to abut the projecting arm of said actuator to release the clutch, and means for turning said actuator to move said lever and close said clutch.

3. In a mule, the combination with the draft scroll shaft, its clutch-members, and its clutch-lever, of a pivoted actuator presenting a throat and a projecting arm, said throat engaging said lever, a slide, means to move the same to abut said projecting arm and move the clutch lever to release the clutch, and a spring connected with said actuator to turn the same and said clutch lever when said clutch is to be closed.

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

WILLIAM D. RUNDLETT.

Witnesses:

GEO. W. GREGORY,

ELIZABETH R. MORRISON.