

No. 706,261.

Patented Aug. 5, 1902.

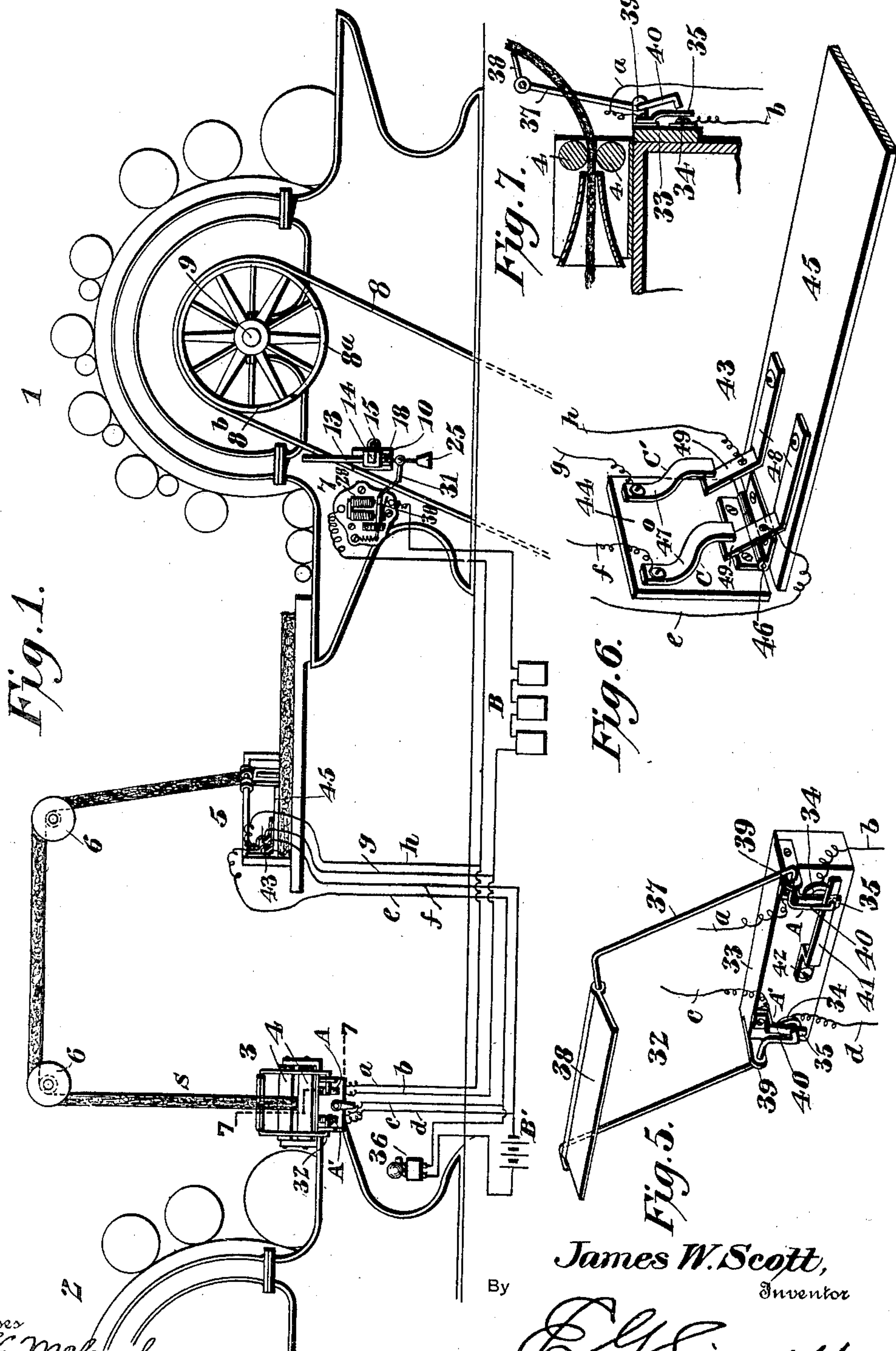
J. W. SCOTT.

COMBINED STOP AND ALARM MECHANISM FOR CARDING MACHINES.

(Application filed June 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 2.

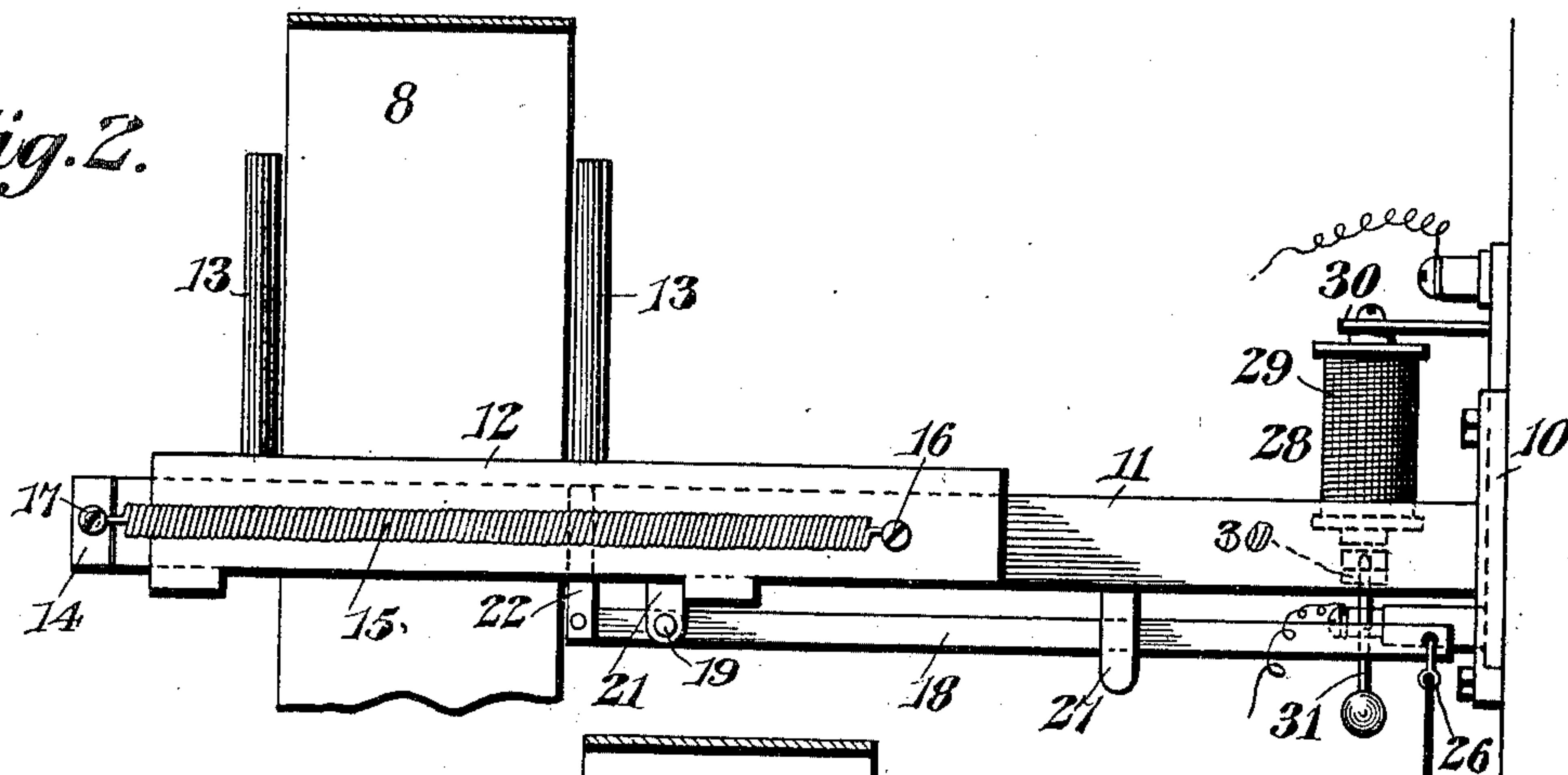


Fig. 3.

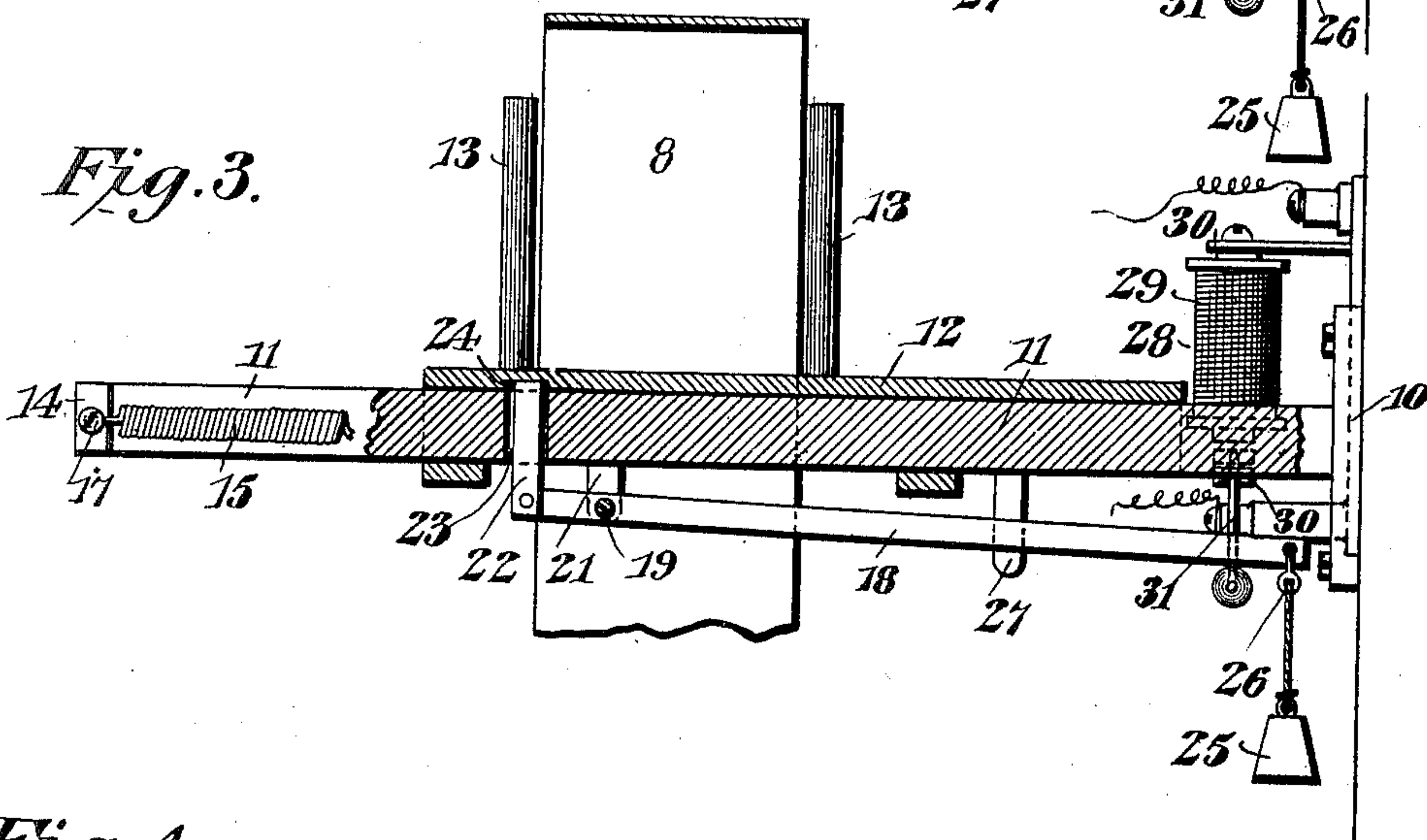
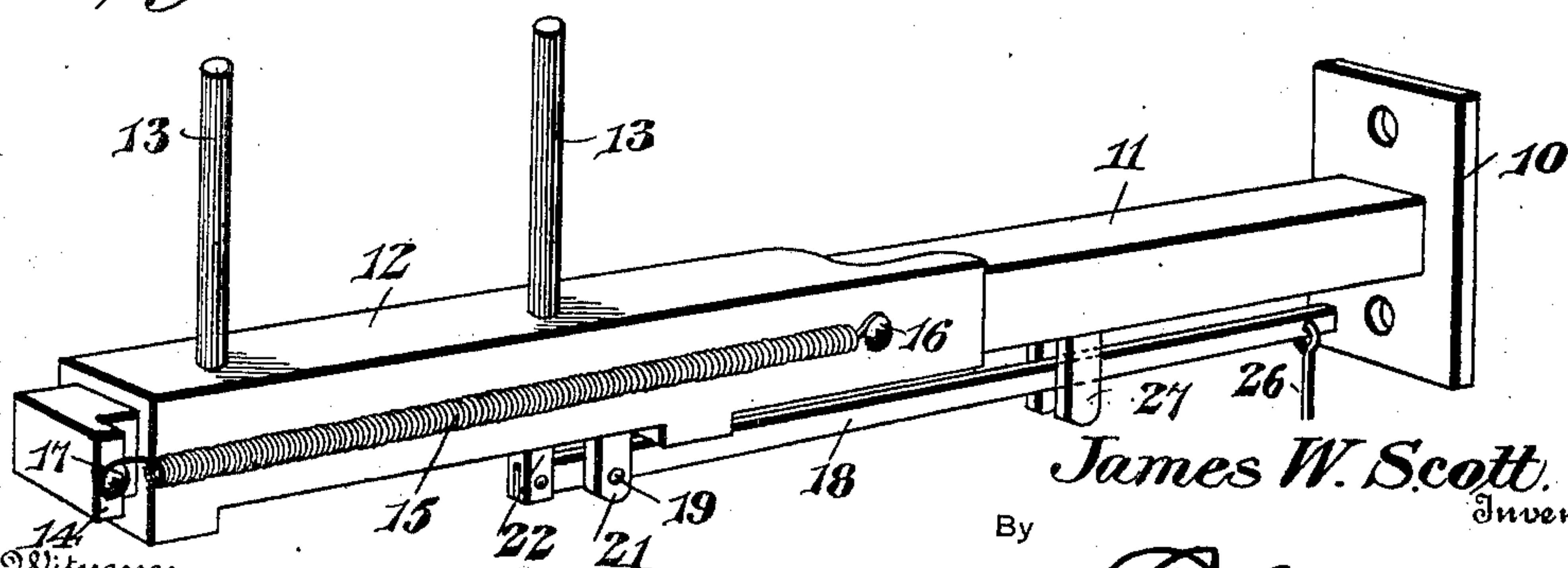


Fig. 4.



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UNITED STATES PATENT OFFICE.

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COMBINED STOP AND ALARM MECHANISM FOR CARDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 706,261, dated August 5, 1902.

Application filed June 9, 1900. Serial No. 19,752. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. SCOTT, a citizen of the United States, residing at Warren, in the county of Knox and State of Maine, have invented a new and useful Combined Stop and Alarm Mechanism for Carding-Machines, of which the following is a specification.

This invention relates to carding-machines, and has special reference to the improvement of that type of devices known as "stop-motions," which are designed ordinarily to effect, through the medium of mechanism complementary thereto, the stoppage of the carding-machine upon the breaking of the sliver, roving, or drawing manipulated by a number of machines arranged in series, the members of which are usually known as the "first" and "second" breakers and the "finisher." As usually constructed the stop-motions applied to wool-carding machines of the character specified effectually disconnect the carding-machine from the power mechanism upon the breaking of the roving; but usually the impetus gained by the "card," as these machines are termed, running at a speed of one hundred or more revolutions per minute causes the card to continue its operation for some seconds after the disconnection of the power mechanism, and the traveler operated to feed the roving or sliver to the Apperly or other feed device makes a number of turns, with the result that an imperfect body of wool is passed to the feed-apron, and this must be corrected by hand before the card can be again placed in operation. Not only this, but the overrunning of the end of the sliver frequently necessitates the removal of the draw-rolls of the finisher and the running of the feed until it is once more effecting a perfect delivery. This operation is wasteful both of material and time, and therefore one of the primary objects of the invention now under consideration is to equip the set of cards or machines with stop mechanism which will effectually prevent the delivery to the feed table or apron of the Apperly or other feeder of such imperfect roving or sliver as will necessitate the correction of the feed by hand or the unusual manipulation of the machine or any complementary parts thereof in order to again inaugurate the proper running of the set.

A further object of the invention is to so organize and arrange the stop-motion that the machine will be stopped when the form of the sliver—as, for instance, the thickness thereof—varies to an extent which will produce an objectionable irregularity in the yarn. This object is accomplished by employing a controlling device supported by the sliver passing over the feed table or apron and designed to effect the stoppage of the machine not only upon the breaking of the sliver, but also upon the delivery to the feed table or apron of a sliver lacking in that uniformity of size and weight which is necessary to secure a corresponding uniformity of the yarn—that is to say, the invention consists in the employment of mechanism for disconnecting the power from the cards and controlled by controlling devices, preferably electrical—as, for instance, a circuit-closer—for operating said mechanism, said controlling device comprehending a controlling element located directly over the feed-table upon which the sliver is supported and held out of its operating position, not by reason of the tension upon the sliver, but by the bulk thereof, and therefore capable of being operated to stop the card when the sliver passing over the feed-table does not possess proper uniformity, it being well understood by those skilled in the art that such irregularity of feed is frequently produced—as, for instance, by the imperfect operation of the self-feeder, which conveys the loose fiber from the hopper to the first breaker.

Still further and subordinate objects of the invention will hereinafter appear as the necessity for their accomplishment is developed in the succeeding description, which is directed to an exposition of the preferred form of my invention illustrated in the accompanying drawings and embraced within the scope of the appended claims.

Figure 1 is a diagrammatic elevation of a breaker and finisher card equipped with the belt-shipper and circuit-closing devices contemplated by the present invention. Fig. 2 is a side elevation of the belt-shipper. Fig. 3 is a longitudinal sectional view thereof. Fig. 4 is a detail in perspective of the belt-shipper. Fig. 5 is a detail in perspective of the circuit-closing device which is associated with the delivery mechanism or drawing-rolls of

the breaker-card. Fig. 6 is a similar view of the circuit-closing device associated with the "Apperly feeder" or other feeding mechanism of the finisher-card. Fig. 7 is a detail sectional view on the line 7 7 of Fig. 1.

Like numerals of reference designate corresponding parts in the several figures of the drawings.

In carrying out the present invention no change is made in the construction of the carding-machine or of any of the appurtenances thereof, and in Fig. 1 of the drawings there is diagrammatically shown the finisher-card 1 and the breaker-card 2 of ordinary construction and arranged in the usual relation, the said breaker-card 2 being sometimes termed the "second breaker," from which the sliver or roving is led to the feeding mechanism of the finisher-card. The only part of the breaker-card or second breaker 2 with which the invention is directly associated is the delivery mechanism 3 thereof, said delivery mechanism essentially comprising a plurality of drawing-rolls 4, between which are drawn the sliver or roving S; but as these rolls are arranged in their usual relation and perform their ordinary functions the same are only diagrammatically illustrated in Fig. 1 of the drawings. With reference to the finisher-card 1 it may be explained that the improvements are specially designed for use in connection with a finisher-card equipped with a feeding mechanism 5, preferably of the type known as the "Apperly feeder;" but this feeding mechanism forms no part of the present invention, and it is therefore likewise shown in diagram. It may be explained, however, that the Apperly feed consists of mechanism which deposits the drawing or sliver received from the overhead rolls in diagonal lines upon an endless apron or feed-table which travels toward and supplies the sliver to what is known as the "finisher"—that is to say, the mechanism of the Apperly feed operates to lay the drawing upon the endless apron, so that its course will be back and forth from side to side of the apron in lines oblique to its line of travel, loops or bends being formed at the sides at each return-point of the drawing. It is therefore evident that at this particular point the sliver or drawing is specially liable to breakage and that in the manipulation described any irregularity in its body or weight will be quickly made apparent, since this peculiar zigzag feed will cause the sliver to be drawn unduly at such points thereof as may be weak because of light weight, and it is for this reason that the stop-motion and feed-indicator is located above the feed-table of the Apperly feeder, because, as stated, it is at this point that irregularities of the feed are most clearly apparent.

The stoppage of the finisher-card is effected through the medium of a belt-shipper, (designated in its entirety by the reference-numeral 7.) This belt-shipper is designed to be associated with the driving-belt 8 of the finisher-

card, which driving-belt is adapted to work over either the fast or loose pulleys 8^a 8^b, which are usually arranged on one end of the main drive-shaft 9 of the finisher-card. In its general construction the belt-shipper 7 comprises a supporting-bracket 10, adapted to be rigidly fastened to one side of the frame of the finisher-card contiguous to the driving-belt 8 and having projected therefrom an off-standing horizontal guide-arm 11, preferably of an angular shape in cross-section, to accommodate for movement thereon a shipper-slide 12. This shipper-slide is preferably in the form of an elongated sleeve, also of an angular shape in cross-section, to conform to the cross-sectional shape of the guide-arm 11 upon which it slides and having projected from the upper side thereof a pair of spaced belt-pins 13, arranged in the usual spaced relation and designed to loosely receive therebetween the driving-belt 8 of the finisher-card, so that a reciprocatory motion of the sliding sleeve 12 will provide for a shipping of the belt from one pulley to the other. The offstanding horizontal guide-arm 11, which slidably supports the shipper-sleeve 12, is of a materially-greater length than the said sleeve 12 to accommodate the full movement thereof to provide for the shipping of the belt from one pulley to the other. At its outer extremity the offstanding horizontal guide-arm 11 is provided with a stop projection 14, which limits or arrests the outward movement of the shipper-sleeve when drawn in a direction for shipping the belt from the fast to the loose pulley, and to provide for forcing the sleeve in this direction there is employed an actuating-spring 15, connected at one end, as at 16, to the shipper-sleeve and at its other end, as at 17, to the outer extremity of the guide-arm 11. The said actuating-spring 15 is of a sufficient strength and tension to provide for bodily moving the belt 8 from the fast to the loose pulley when the shipper-sleeve 12 is released from its set position with the belt working over the fast pulley 8^a of the drive-shaft 9. By moving the shipper-sleeve in an inward direction the drive-belt is carried upon the fast pulley, and to secure the shipper-sleeve 12 in its set position against the tension of the actuating-spring therefor there is employed a lock-lever 18. This lock-lever 18 is preferably arranged beneath the offstanding guide-arm 11 and is pivotally mounted contiguous to one end, as at 19, in a bearing hanger or bracket 21, pendent from the inside of the said guide-arm 11. The short arm of the lock-lever 18 contiguous to its pivotal support 19 has pivotally attached thereto at the lower end a vertically-movable latch-pin 22, working through a guide-opening 23, piercing the arm 11 and adapted to have its upper end engage in a locking-notch 24, formed in the inner face of one of the sides of the sleeve 12, as plainly illustrated in Fig. 3 of the drawings. To provide for normally holding the latch-pin 22 engaged with the lock-

ing-notch 24 of the sleeve 12, the long arm of the lever 18 is yieldingly depressed, preferably by means of a weight 25, having a hanger connection 26 with the extremity of the lever 18, opposite the end to which the latch-pin 22 is connected and at a point between the pivotal support 19 and the weighted connection therewith. The said lock-lever is preferably steadied and guided in its movements within a bifurcated or open guide-keeper 27, pendent from the under side of the frame 11. It will thus be seen that the weight 25 serves to normally maintain the latch-pin 22 in locking engagement with the sleeve 12 to hold the pins 13 upon the belt when the latter is working over the fast pulley 8^a, and when the stoppage of the finisher-card becomes necessary this is accomplished by disengaging the pin 22 from the locking-notch 24, so as to leave the actuating-spring 15 free to retract or draw the shipper-sleeve 12 in an outward direction for shipping the belt from the fast pulley 8^a to the loose pulley 8^b. The releasing of the latch-pin from the sleeve may be accomplished by various expedients, but in the present invention preferably so through the medium of an electromagnetic release device 28. The electromagnetic release device may be conveniently in the form of the electromagnets 29 and the vibrating armature 30, associated therewith. For the purposes of the present invention the vibrating armature 30 constitutes a trip for the lock-lever 18 and is provided with a trip-arm portion 31, the extremity of which plays beneath the weighted or normally depressed end of the lock-lever 18. When the electromagnets 29 are energized, the vibrating trip-arm 31 will strike the weighted end of the lock-lever 18, thereby causing this end of the lever to be elevated and correspondingly depressing the other end, with a consequent withdrawal of the latch-pin 22 from the locking-notch 24, which action releases the shipper-sleeve in the manner previously explained.

The energization of the release device 28 is designed to be accomplished upon the breakage of the sliver or roving S, either at the delivery mechanism 3 of the breaker-card 2 or at or adjacent to the Apperly feeder or feeding mechanism 5 of the finisher-card or by a material decrease in the bulk of the sliver as it passes over the feed-table for delivery to the finisher. To provide for the operation of the stop-motion, which essentially consists of the belt-shipper 7 and the parts associated therewith, and the sounding of an alarm upon the breakage of the sliver at the delivery end of the breaker-card 2, there is employed at this point a circuit-closing device 32. This circuit-closing device is designed to be arranged adjacent to and directly beyond the drawing-rolls 4 of the delivery mechanism 3 of the breaker-card and in its general construction is substantially the same as the stop-motion or circuit-closer covered by the recent patent to myself and P. A.

Leech, No. 649,366. In the present invention, however, the circuit-closing device 32 is modified to adapt the same for simultaneously closing not only the stop-motion, but also an alarm-circuit.

Referring specifically to the construction of the circuit-closing device 32, the same essentially consists of a supporting-block 33, to which is fitted a pair of separate and independent circuit-closers A A', respectively, each of said circuit-closers consisting of a fixed metallic contact-button 34 and a removable contact-plate 35, secured fast at one end to the block 33 and having its free portion arranged over and normally out of contact with the button 34 and capable of being forced into contact with said button to provide for closing the electric circuit associated therewith. The circuit-closer A of the circuit-closing device 32 constitutes a stop-motion circuit-closer, and the separate elements 34 and 35 thereof have respectively connected thereto the stop-motion circuit-wires *a b*, which wires are also connected with the release device or relay 28 and have included in the circuit thereof a battery B, consisting of one or more cells, as desired. The other circuit-closer A' of the circuit-closing device 32 constitutes a circuit-closer for the alarm-circuit, and the respective elements 34 35 of the circuit-closer A' have connected thereto the alarm-circuit wires *c d*, which have included in the circuit thereof an electric alarm-bell 36 and a battery B'.

The supporting-block 33 of the circuit-closing device 32 is adapted to be suitably secured to the frame of the breaker-card or second breaker 2, below and contiguous to the drawing-rolls 4 of the delivery mechanism 3, and in connection with the pair of circuit-closers A A', carried by the said block 33, there is associated a swinging actuating-bail 37, which is termed in the aforesaid former patent a "stop-bail." The said swinging stop-bail 37 is of an approximate U form and carries on the cross-bar thereof a guard-plate 38, against which the sliver or filament bears and serves to sustain the bail 37 in an inoperative position when the sliver is working properly and there is no break therein, it being observed that the bail 37 is held in position or sustained by a vertically-extending unbacked portion of the sliver, the sagging of which will effect the actuation of the bail, the position of the latter being therefore dependent, as will be obvious, upon the tension of the sliver as it passes from the delivery-rolls of the second carder to the overhead rigging. The said swinging actuating-bail 37 is also provided with pintle ends journaled in bearing-plates 39, fitted to the supporting-block 33, and which pintle-arms are extended into angled pressure-arms 40, which are disposed beyond and directly opposite the movable contact-plates 35 of the circuit-closers A A' and are designed to bear upon said plates to move them against the buttons 34, when

the sliver breaks and permits the bail 37 to swing downward under its own weight. When the stock has run out of the card and there is no necessity for the circuit-closers being actuated, the bail is held in its inoperative position by means of a pivotal cut-off latch 41, which is loosely pivoted at one end, as at 42, to the block 33 and normally swings or gravitates to a pendent inoperative position when the weight of the bail is relieved therefrom; but by moving the said cut-off latch 41 to a position in front of one of the movable contact-plates 35, so that one of the pressure-arms 40 will bear thereon, the weight of the bail will be held off from the circuit-closers until the stock is again running and sustaining the swinging bail 37 in its inoperative position. With the stock running and passing from the drawing-rolls 4 beneath the guard-plate 38 of the bail 37 the circuit-closers A A' will remain inactive; but should a breakage of the sliver occur at any point contiguous to the drawing-rolls 4 the bail 37 will be permitted to drop, thus causing the pressure-arms 40 thereof to bear upon the movable plates 35 of both circuit-closers A A', thus simultaneously closing the stop-motion circuit *a b* and the alarm-circuit *c d*. The bell 36 will be energized, so as to give an alarm indicating the breakage, while the release device 28 will at the same time be energized and trip the lock-lever 18 to provide for the shipping of the belt in the manner previously explained. At this point it should be noted that the location of the circuit-closing device 32 at a point adjacent to the delivery-rolls of the second breaker is material, inasmuch as this location is sufficiently removed from the Apperly or other feeder of the next succeeding machine or finisher to prevent the disrupted or damaged portion of the sliver produced by a break adjacent to the closer 32 from reaching the feed-table of the Apperly or other feeder by reason of the impetus gained by the machine—that is to say, the circuit-closer 32 is designed located at such distance from the feed-table that the overrunning of the finisher after the disconnection of the power mechanism will not serve to draw the injured portion of the sliver onto the feed-table, and thus necessitate the correction of the feed by hand in the manner heretofore indicated.

We now come to the consideration of that second device which controls the operation of the finisher by disconnecting the same from the power upon a breakage of the sliver, but which in addition to this function performs the office of a feed gage or indicator, serving to stop the machine and to simultaneously sound an alarm to apprise the operator in the event of the presentation to the feed-table of the Apperly or other feeder of a sliver which is not of such uniform bulk as may be deemed necessary. This said second circuit-closing device 43 is designed to be attached to any suitable part of the feeder or feeding mechanism

5 to permit the sliver supported upon the feed-table to pass beneath the movable element thereof, and the said device essentially consists of a base comprising fixed and movable sections 44 and 45, which are preferably connected at their contiguous edges by a hinge or equivalent joint 46. The fixed base-section 44 is designed to be fastened by bolts or other suitable means to a fixed part of the feeder or feeding mechanism 5 of the finisher-card, while the movable or hinged section 45 is preferably of a greater length, so as to constitute what may be properly termed a "floating leaf," which loosely rests upon the top of the sliver as it passes out of the feeder or feeding mechanism upon the table leading to the rolls of the finisher-card, and there is associated with the fixed and movable sections 44 and 45 of the base a pair of separate and independent circuit-closers C C', each consisting of a fixed and a movable contact-plate 47 48, respectively, fitted to the fixed and movable sections of the base. The fixed contact-plate 47 of each circuit-closer is secured fast at one end to the fixed base-section 44 and is bowed outwardly and offset therefrom, so as to overhang the upturned end 49 of the complementary movable contact-plate 48, which is secured fast at one end to the movable section 45 of the base. When the said movable section 45 of the base is floating upon the sliver of a predetermined size, the upturned ends of the plates 48 carried thereby are held behind and out of contact with the overhanging ends of the fixed plates 47, carried by the fixed base-section 44, so it is obvious that upon a breakage of the sliver after leaving the leader-rolls 6 or just before entering the feeding mechanism 5 the floating element 45 after the stock has passed from beneath it will drop to a depressed position and carry the upturned ends 49 of the contact-plates 48 into metallic contact with the plates 47, thus simultaneously closing both circuit-closers C C'. It will appear, further, that the same effect will be produced—that is to say, both circuits will be closed—by the depression of the floating element or leaf 45 by reason of the falling of the sliver below its proper standard—that is to say, by the irregular feeding of the sliver to the feed-table—and in this connection it should be noted that this latter use of the floating leaf—that is, the utilization thereof as a feed-indicator—is made possible by reason of the fact that that portion of the sliver against which it operates is backed or directly supported. It is therefore impossible for this portion of the sliver to sag—as, for instance, upon the easing of the tension thereon—and hence the floating leaf 45 can only be depressed when the sliver runs thin over the feed-table or is broken. The circuit-closer C has connected to the separate members 47 48 thereof, respectively, the branch circuit-wires *e f* of the alarm-circuit *c d*, while the circuit-closer C' has connected to the separate elements 47 48 thereof, respectively, the

branch wires *gh* of the stop-motion circuit *ab*. Consequently upon a closing of the two circuit-closers *C C'* in the manner explained the alarm-bell 36 will be sounded and the belt-shipper 37 actuated to effect the simultaneous sounding of the alarm and the stopping of the finisher-card in the same manner as caused by a breakage of the sliver contiguous to the primary circuit-closing device 32.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described combined alarm and stop mechanism will be readily understood by those familiar with the art without further description, and it will be understood that various changes in the form, proportion, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. The combination with a carding-machine, and stop mechanism, of a flat feed-table over which the sliver is led to the machine, a floating leaf hinged at one edge and supported directly opposite such surface by the sliver passing thereover, and means for effecting the operation of the stop mechanism upon the gravitation of the leaf permitted when the sliver passing over the feed-table is less than the predetermined thickness.

2. The combination with a carding-machine and stop mechanism, of a supporting-surface over which the sliver is led to the machine, a flat floating leaf supported directly opposite such surface by the sliver passing thereover, and means for effecting the operation of the stop mechanism through the movement of the leaf.

3. The combination with a carding-machine, and a feed-table, of electrical controlling mechanism for the carding-machine including a stop-motion circuit, and a circuit-closer having a flat floating leaf disposed directly over and in substantially parallel relation with the table to permit its support upon that portion of the sliver passing over and supported by the feed-table, said circuit-closer being organized to effect the closing of the circuit upon the gravitation of the leaf permitted when the sliver fed to the feed-table is less than a predetermined thickness.

4. The combination with a carding-machine, and a horizontal feed-table, of electrical controlling mechanism for the carding-machine including a stop-motion circuit, a circuit-closer having a hinged leaf formed with a flat smooth under surface imposed upon the flat sliver passing over the feed-table, said leaf serving to cover a considerable portion of the sliver upon the feed-table in order to prevent its actuation by slight irregu-

larities of the sliver, and to insure its depression when a considerable amount of the sliver passing over the feed-table is less than a predetermined thickness.

5. The combination with a carding-machine, and a feed-table, of electrical controlling mechanism for the carding-machine including a stop-motion circuit, a circuit-closer having a flat floating leaf disposed directly above the table to be sustained on top of the sliver passing over said table, and an alarm-circuit also controlled by said circuit-closer, whereby when the sliver passing over the table is less than a predetermined thickness, both the stop-motion circuit and the alarm-circuit will be automatically closed to stop the machines and to sound an alarm apprising the operator of the irregular feed of the sliver.

6. In a device of the character described, the combination with stop mechanism and electrical controlling means therefor including a stop-motion circuit, of a circuit-closer consisting of a base having fixed and movable sections hinged together, the movable section being horizontally disposed and connected to the lower end of the fixed section, and contact-plates carried by the fixed and movable sections of the base and designed to be brought into contact upon the downward swinging of the movable section.

7. In a device of the character described, the combination with stop mechanism and electrical controlling means therefor including a stop-motion circuit, of a circuit-closer consisting of a base having fixed and movable sections hinged together, the movable section being in the form of a flat smooth floating leaf, a contact device mounted upon the upper side of said leaf adjacent to its hinge connection, and a cooperating contact device mounted upon the fixed base-section adjacent to the hinge.

8. In a mechanism of the class described, the combination of a belt-shipper having an electrical releasing device, a stop-motion circuit including said releasing device, and a circuit-closing device consisting of a base having fixed and movable sections hinged together, the movable section being arranged in a substantially horizontal plane for support on top of the sliver, a fixed pendent contact-plate fitted to and offset from the fixed base-section, and a movable contact-plate fitted to the upper side of the movable base-section and having an upturned end overhung by and normally out of contact with the pendent end of the fixed plate, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES W. SCOTT.

Witnesses:

L. C. STUDLEY,
E. W. MATHEWS.