Dec. 27, 1932. A. F. PARKER 1,892,116

STOP MOTION MECHANISM FOR DRAWING FRAMES USED IN THE TREATMENT OF FIBROUS SUBSTANCES

Filed Dec. 30, 1931 4 Sheets-Sheet 1

*Fig. 1.*

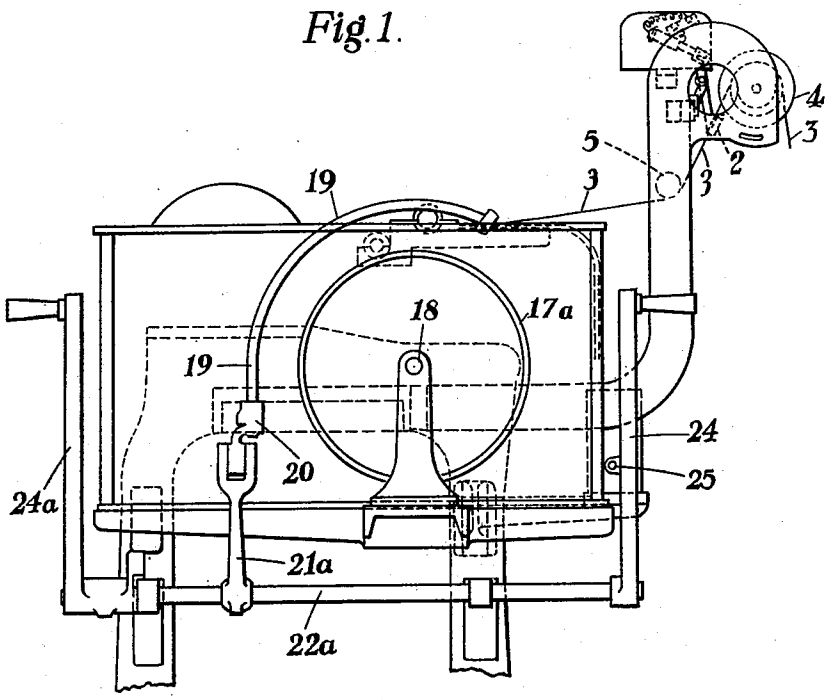
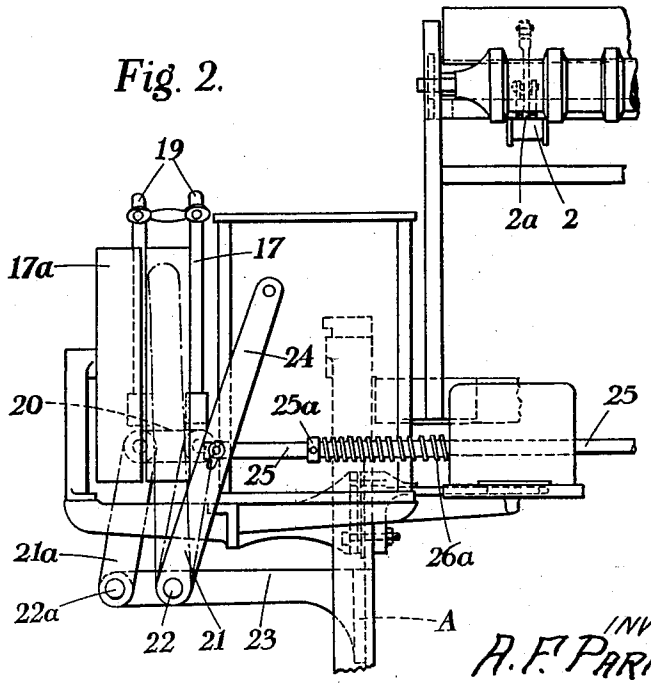



*Fig. 2.*




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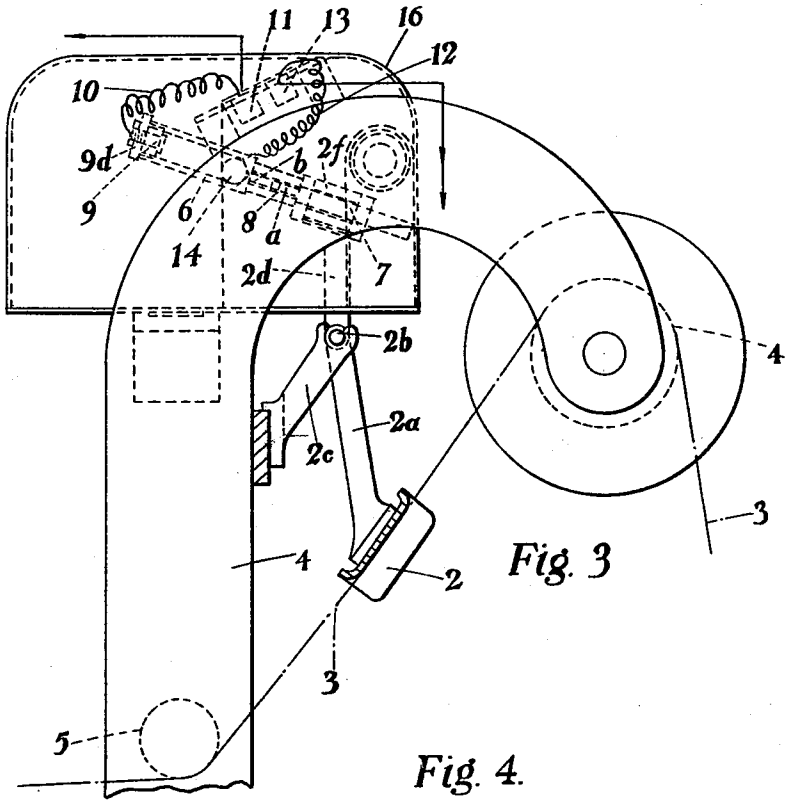
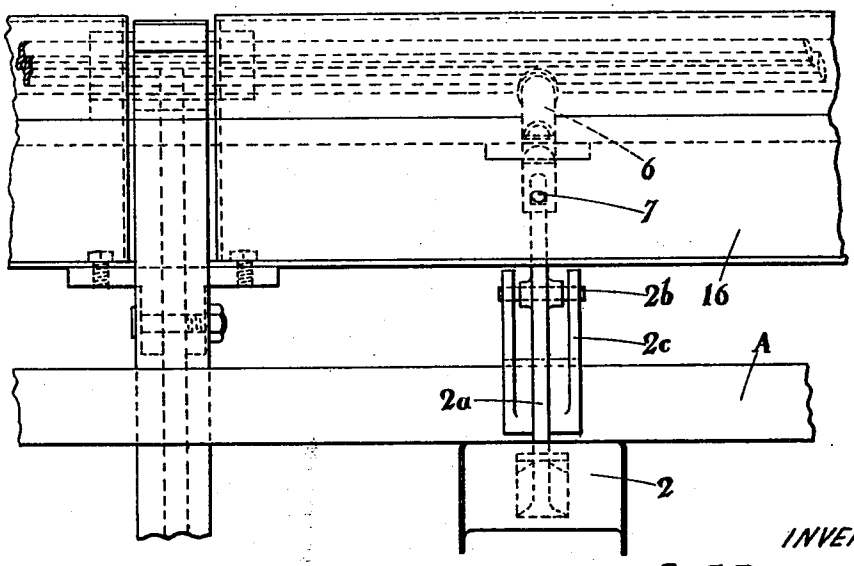



Fig. 3

Fig. 4.



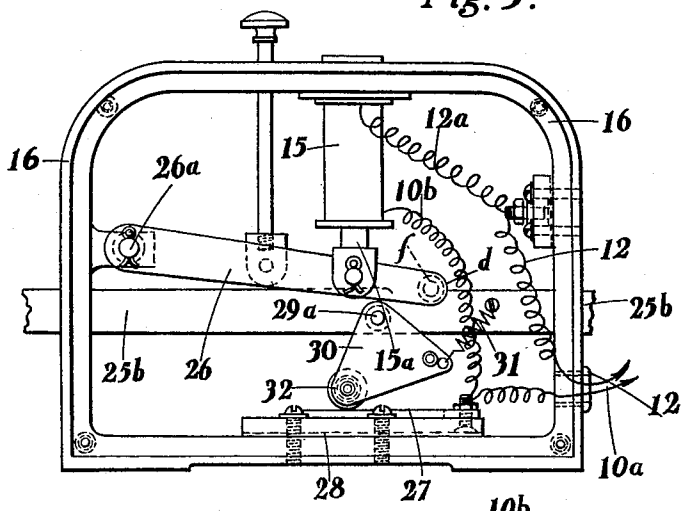

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Fig. 5.



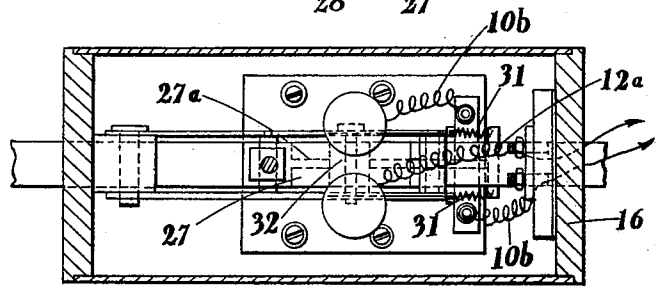




Fig. 6.

Fig. 8.

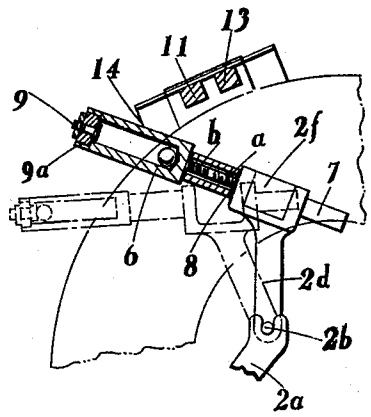
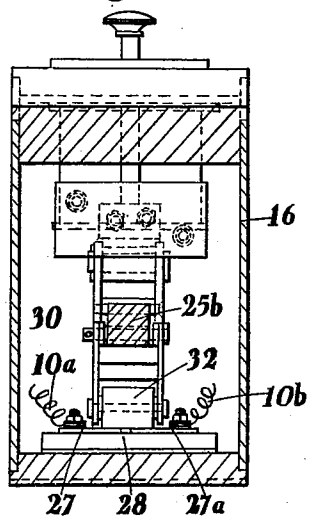



Fig. 7.




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STOP MOTION MECHANISM FOR DRAWING FRAMES USED IN THE TREATMENT OF FIBROUS SUBSTANCES

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*Fig. 9.*

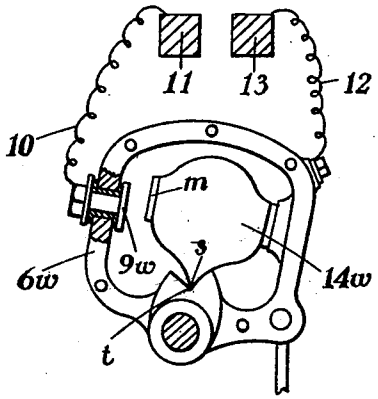



*Fig. 10.*

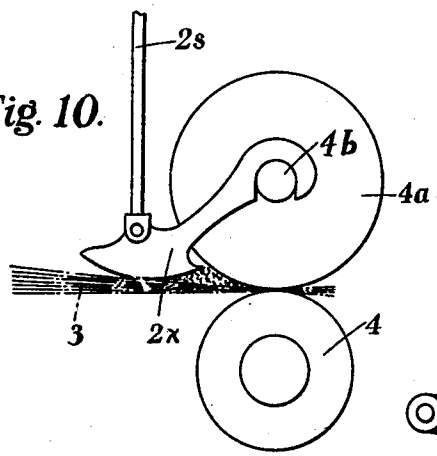
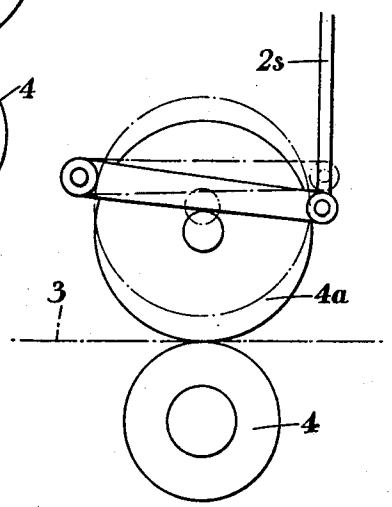



*Fig. 11.*




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# UNITED STATES PATENT OFFICE

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## STOP MOTION MECHANISM FOR DRAWING FRAMES USED IN THE TREATMENT OF FIBROUS SUBSTANCES

Application filed December 30, 1931, Serial No. 583,982, and in Great Britain December 30, 1930.

This invention relates to stop motion mechanism for drawing frames used in the treatment of fibrous substances, especially flax, hemp and the like, and consists in the arrangement and construction of said devices whereby on the failing of the sliver in the type of machine referred to, or undue slackness of said sliver when moving from one roller to another or when any undue accumulation of the sliver occurs my said devices are brought into action in order to arrest the motion of the machine to prevent unnecessary loss as is well known. The devices I employ are characterized by the employment of detector members contacting with the sliver so that on being moved thereby, as is hereinafter explained, a tilting action imparts motion thereto so that a rolling ball or sphere or like freely moving body will complete an electric circuit to perform the other functions desired under the conditions hereinafter explained.

I hereinafter describe my invention by reference to the accompanying sheets of drawings in which:—

Fig. 1 is an end elevation of sufficient of the upper part of a drawing frame to show the application thereto of my improved devices.

Fig. 2 is a view of the parts shown by Fig. 1 as seen looking from right to left of said figure.

Fig. 3 is an elevation showing the upper part of the devices illustrated by Fig. 1 drawn to an enlarged scale.

Fig. 4 is a front elevation of the devices shown by Fig. 3 as seen looking from right to left of said figure.

Fig. 5 is a side elevation showing the arrangement of magnets and devices operated thereby for effecting the stoppage of the machine by the actions of the detector mechanism hereinafter described.

Fig. 6 is a sectional plan of the parts shown by Fig. 5.

Fig. 7 is a sectional end elevation of the parts shown by Fig. 6 and as seen looking from right to left of said figure.

Figure 8 is a sectional drawing in detail showing certain parts operated by the detector mechanism hereinafter explained.

Fig. 9 is a side elevation showing a modification of the devices illustrated by Fig. 8.

Fig. 10 shows a well known type of detector which I make use of for actuating my circuit closing members when any undue accumulation of fibers is presented to said detector.

Fig. 11 is an elevation of well known mechanism which I use for actuating my devices for stopping the machine when the sliver has commenced to wind around one or other of the rollers instead of passing between said rollers.

In carrying my invention into effect I make use of an appropriate detector member 2 for each sliver 3 in the machine and this I arrange to lie or rest lightly in contact with its said sliver 3 as same travels or extends between the set of rollers 4 and the guide rollers 5.

In other forms of machines, said detector member 2 is arranged to rest or lie in contact with the sliver 3 prior to same passing or travelling between the rollers 4 and 4*a* as shown by Fig. 10, so as to act as hereinafter explained. Again the detector 2 may be in the form of a lever 2*x* arranged to rest lightly upon the axle 4*b* of the roller 4*a* as shown by Fig. 10 in order to operate my contacting member as is hereinafter stated.

In the arrangement of the detector as shown by Figs. 1, 2, 3 and 4, when the sliver 3 is intact or in continuity it supports the detector 2 so that the machine is maintained in motion. However, when the sliver 3 is broken or fails or becomes unduly slack, then the motions imparted to such detector 2, completes an electric circuit to effect a stoppage of the machine under conditions well known, my improved devices for effecting said results being of the character hereinafter described.

Each of the detectors 2 is mounted upon a lever arm 2*a* pivoted at 2*b* so that it will lie lightly upon the sliver 3, while said detector 2 is of the usual shape to afford suitable contact with said sliver 3 as is well known.

My said detector 2 is in the form shown by the drawings and is fixed upon a lever arm 2*a* pivoted at 2*b* as before stated, the bearings 2*c* for same being fixed upon the framework A.

From this it will be observed that on the breakage or failing of the sliver 3, said detector 2 is permitted to descend under the actions or weight of the operating devices 6, which devices are constructed and arranged as is hereinafter described. The devices 6 are supported by the upper arm 2*d* of the lever 2*a* upon which the detector 2 is mounted as is shown by the drawings.

Upon the arm 2*d* of the lever 2 is mounted an adjustable bolt 7 which is arranged to slide through the bifurcated end of the arm 2*d* as the screwed adjusting nut 2*f* is rotated by the attendant in order to adjust the devices in one position or the other to counterbalance the detector.

The end *a* of the bolt 7 is made so that a sleeve 8 of insulating material, may be screwed thereon, while in the other end of the insulating tube 8 the extending screwed projection *b* from the hollow sleeve or tube 6, is also fixed. By these means the metal sleeve 6, which is supported by the insulating member 8, is electrically insulated from the other parts of the devices described.

In the outer end of the tube 6 is fixed a bolt 9 which is electrically insulated by the material 9*a* so that the wire 10 may be fixed to this bolt, the said wire being thus insulated from the tube 6 at one end, while its other end is fixed to the longitudinal bar 11 which extends lengthwise the machine and which may be coupled to the main and through it to the magnet.

The electric wire 12 has one end fixed to the insulated tube 6, while its other end reaches to the bar 13 which extends lengthwise the machine and is connected to the electric main.

The bars 11 and 13 are electrically connected to the whole series of detectors 3 throughout the length of the machine.

When the sliver 3 fails or breaks or becomes unduly slack the detector 2 is permitted to oscillate about the centre 2*b* under the weight of the members carried by its arm 2*d*. Thus the tube 6 is brought into a somewhat slanting position as shown by broken lines in Fig. 8.

Arranged to roll freely in the tube 6 and still to fit same comparatively snugly, is a sphere or ball of metal 14 so that when the tube 6 descends into the positions shown by Fig. 8 said sphere 14 will have rolled down within the tube 6 and will have contacted with the head of the bolt 9. By these means it will complete the circuit between said bolt 9 and the wall of the tube 6 to which one end of the wire 12 is fixed. In this manner the current will then pass through said wire 12, tube 6, sphere 14, bolt 9 and the wire 10 to energize an electro magnet and bring about a stoppage of the machine by operating devices hereinafter described.

The devices which I use for effecting a stoppage of the machine by the actions of the electric current as described, consist of a solenoid or a pair of solenoids or an electromagnet 15 preferably mounted within a casing 16 in order that it may be thereby protected from dust or the like.

This electromagnet 15 I arrange to actuate the devices hereinafter described which are for shifting the driving belt from the fast to the loose pulley, although it is obvious that such electromagnet might operate a clutch or might shut-off the current of an electric motor when such a motor is used for driving the machine.

The fast and loose driving pulleys 17 and 17*a* of the machine are mounted upon the driving shaft 18, the one 17 being fixed thereon, while the other 17*a* runs loosely.

Belt forks 19 are fixed upon a member 20 which is pivoted to the upper ends of two levers 21 and 21*a*.

These levers are fixed upon shafts 22 and 22*a* carried by supporting arms 23 fixed to the framework A, while fixed to the shaft 22 are the two starting handles 24 and 24*a* in order that the attendant may, by the said handle 24 or the handle 24*a*, start the machine into action or stop same as is from time to time required.

Pivotally connected to the hand lever 24 is a sliding supporting bar 25 which, when the machine is in motion, occupies such a position that, by the hoop 25*a* fixed thereon, a spring 26*a* is retained in a state of compression during the actions of the machine.

The rod 25 is arranged to be connected to a sliding bar 25*b* which slides through the casing 16 within which the electromagnet or solenoid 15 is mounted. This sliding bar 25*b* has a notch *d* formed in it to receive a retaining bowl or runner *f* carried by the lever 26 which is pivoted at 26*a* to the casing 16.

To the armature 15*a* of the solenoid 15 is pivoted the lever 26 so that as said solenoid is energized to withdraw its armature 15*a*, this latter will raise the lever 26 so that its runner *f* is withdrawn from the notch *d* in the sliding bar 25*b*. By these means the bar 25*b* is liberated and through the recoil of the spring 26*a* is caused to move the handle 24 and thereby shift the belt from the fast pulley 17 on to the loose pulley 17*a* to arrest the motion of the machine.

The connections of the wires 10 and 12 to the bars 11 and 13 respectively are carried out so that the wires 10*a* and 12*a* may be connected to the solenoid 15 as is shown by Figs. 5, 6 and 7.

The wire 10*a* is shown connected to one of a pair of insulated metal plates 27, 27*a* which are supported by the insulating member 28 that is fixed to the base of the casing 16, while the wire 10*b* connects the other plate 27*a* to the solenoid 15. The plates 27 and 27*a* are insulated from each other by both of them being separately supported by the member 28.

Pivoted at 29*a* to the bar 25*b* is an angular lever member 30 which is held by a spring 31 so that a metal runner 32 pivoted thereon is always pressed into contact with the insulated metal plates 27 and 27*a* when the sliding bar 25*b* is in the position shown by Fig. 5, so that at such time when the current passes through the wire 10*a* it travels through the plate 27, through the metal runners 32, through the wire 10*b* to the electro magnet 15, by which arrangement the energized magnet 15 will withdraw the retaining runner *f* from the notch *d* with the result above stated.

When the lever 26 releases the bar 25*b* so that same may be brought under the retracting actions of the spring 26*a* the moving of said bar 25*b* will carry the runner 32 clear of the insulated conducting plates 27 and 27*a* and so the current will be shut-off from the solenoid 15 at all times when the starting mechanism or the belt guide devices 24 are in position for retaining the driving belt upon the loose pulley in order to keep the machine stationary.

This function is permitted by reason of the wire 10*a* being insulated from the wire 10*b* except when the runner 32 is resting upon the plates 27 and 27*a*.

As means for enabling the attendant at all times to arrest the motion of the machine from any position adjoining said machine (which will afford ready access thereto) I use push button or other switch devices which I mount in any desired position on the machine or in any other place where it is found advantageous that same should be brought under the control of the attendant to arrest the motion of the machine whenever desired.

The detector devices as shown by Figs. 10 and 11 are connected by the rods 2*s* to modified forms of the lever 2*a* so that said modified forms may act in connection with the members 6, 9 and 14 as is hereinbefore described in order to arrest the motion of the machine under the conditions explained. Instead of making use of a sphere or ball 14 I may make use of an oscillating or loosely mounted member 14*w* which will rest upon its pivoted end *s* within the notch of the oscillating box or enclosure 6*w* (the side wall of which is removed) as shown by Fig. 9. This oscillating member 14*w* is pivoted at *t* and has on one side of it an insulated contact piece 9*w* which is connected by the wire 10 to the bar 11, while to the bar 13 is connected a wire 12 which is coupled to the outer casing of the member 6*w*. Thus when the devices are in the position shown by Fig. 9 the machine will be in operation, but when the device 14*w* is tilted by any of the means hereinbefore explained then the member 14*w* will oscillate so that its contact surface at *m* will complete the circuit through the insulated terminal 9*w*, wire 10 to the bar 11, the results in this case being the same as in that herein first before described.

Such being the nature and object of my said invention, what I claim is:—

1. In stop motion mechanism for drawing and like machines used in the treatment of fibrous substances, a detector for contacting with the sliver or like fibrous substances, a pivotal arm for supporting said detector, a member forming an enclosed space for a freely moving body, said body, an electric terminal carried by but insulated from said enclosing member so that the freely moving body may complete the circuit, an electromagnet situated in said circuit and devices operated by said magnet to effect a stoppage of the machine.

2. In stop motion mechanism for drawing and like machines used in the treatment of fibrous substances, a detector for contacting with the sliver or like fibrous substances, a pivotal arm for supporting said detector, a member forming an enclosed space for a freely moving body, said body, an electric terminal carried by but insulated from said enclosing member, a freely moving body mounted within said enclosing member for contact with said electric terminal, an electromagnet situated in the circuit completed by the freely moving body, a retaining lever actuated by said electromagnet to relieve a sliding bar, said sliding bar, a spring for actuating said sliding bar, and means for coupling said sliding bar to the belt shifting or clutch mechanism through which motion is transmitted to the machine.

3. In stop motion mechanism for drawing and like machines used in the treatment of fibrous substances, a detector for contacting with the sliver or like fibrous substances, a pivoted arm for supporting said detector, a closed tube carried by said arm, a terminal fixed at one end of said closed tube, a metal ball or sphere snugly fitting within said tube so as to freely move therein, wires connecting the terminal and the tube so as to bring same into circuit with an electromagnet, said electromagnet, a retaining lever actuated by said electromagnet, a spring actuated sliding bar retained in position by said lever, a member mounted on said lever for supporting a roller, said roller being made to travel over two separate strips of metal which it electrically connects together and means whereby the roller is insulated from the strips when the sliding bar is moved to stop the motion of the machine.

4. In stop motion mechanism for drawing and like machines used in the treatment of fibrous substances, a detector for contacting with the sliver or like fibrous substances, a pivoted arm for supporting said detector, an oscillating box for enclosing the freely moving member, supports upon which said metal box may oscillate, said freely moving mem-

ber pivoted within said box to act in connection with a terminal carried by said box, but insulated therefrom, wires connecting the terminal and the box to bring same into circuit with an electromagnet, a retaining lever actuated by said electromagnet, a spring actuated sliding bar retained in position by said lever, a member mounted on said lever for supporting a roller, said roller being made to travel over two separate strips of metal which it electrically connects together and means whereby the roller is insulated from the strips when the sliding bar is moved to stop the motion of the machine.

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