

Sept. 10, 1963

A. DUQUETTE

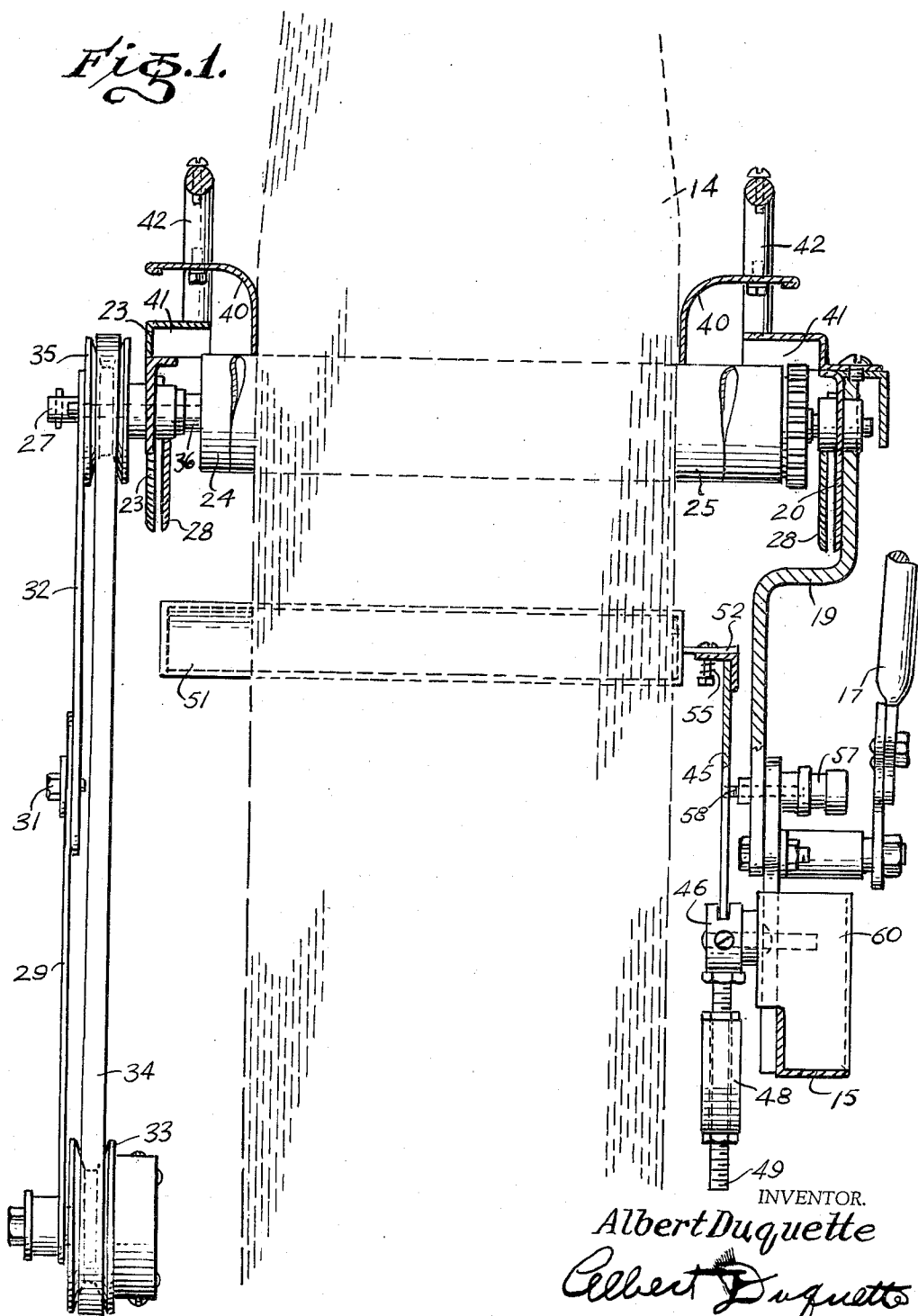
3,103,040

CARD STOP FOR TEXTILE MACHINES

Original Filed June 10, 1957

5 Sheets-Sheet 1

Fig. 1.



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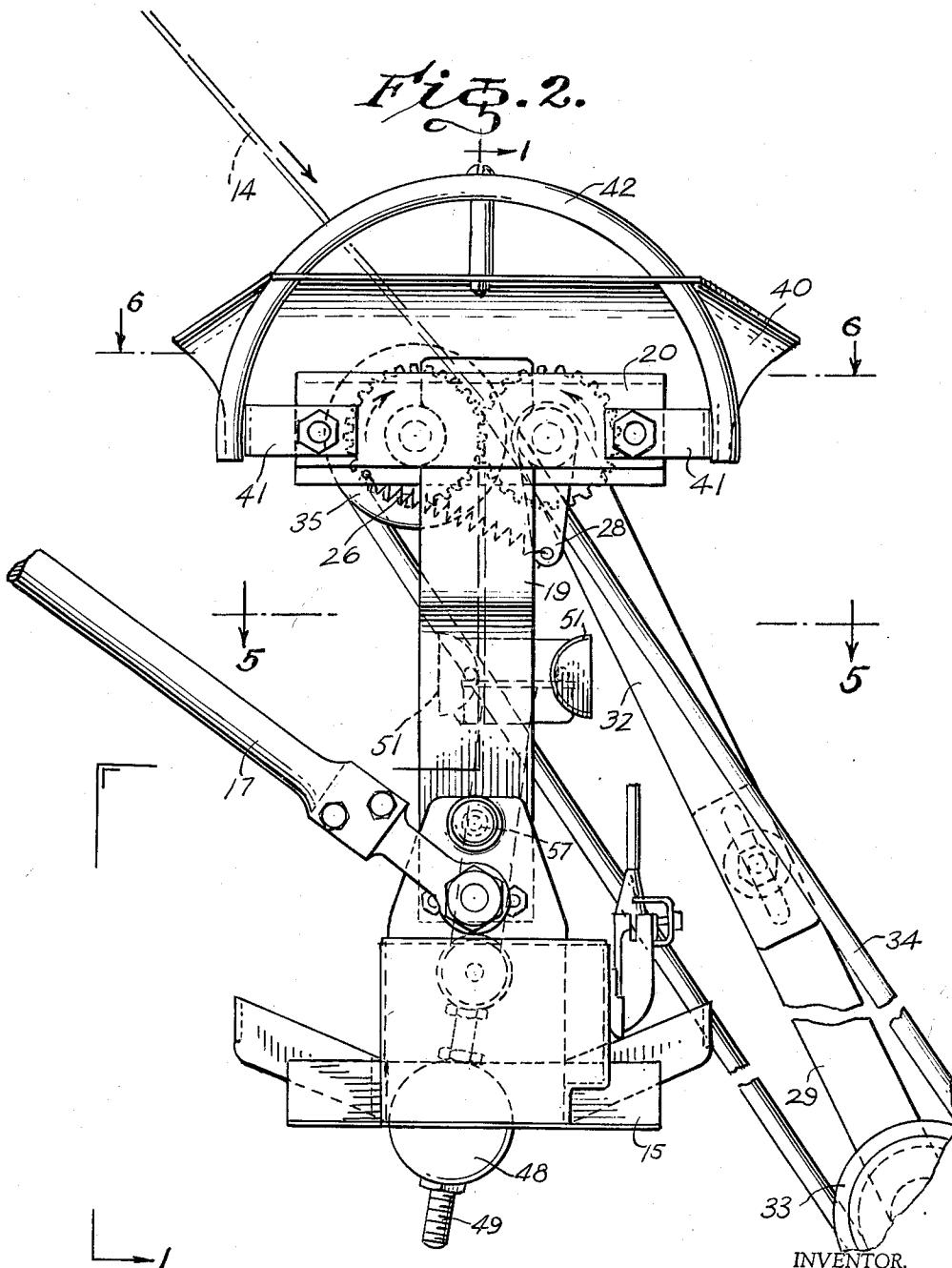
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CARD STOP FOR TEXTILE MACHINES

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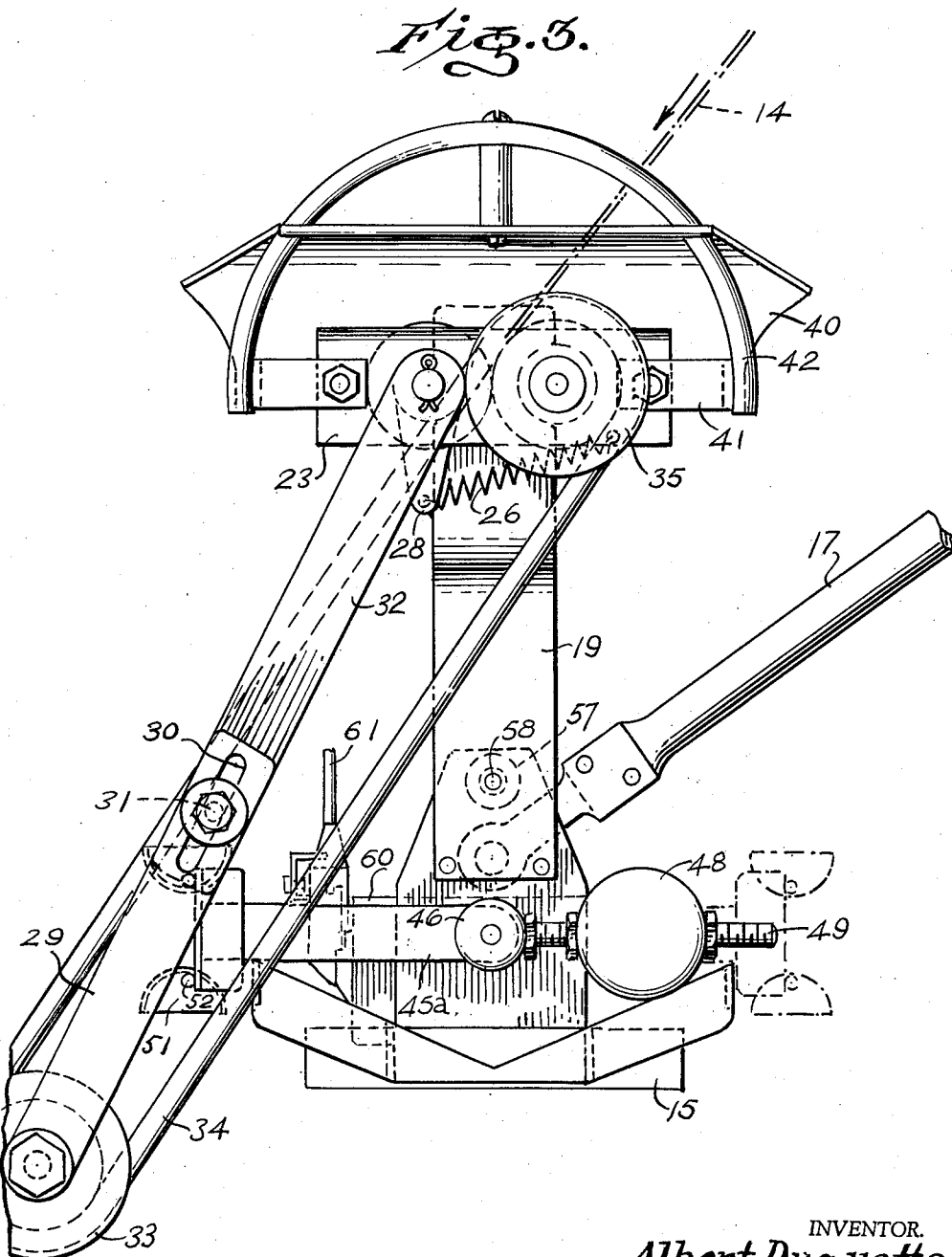
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CARD STOP FOR TEXTILE MACHINES

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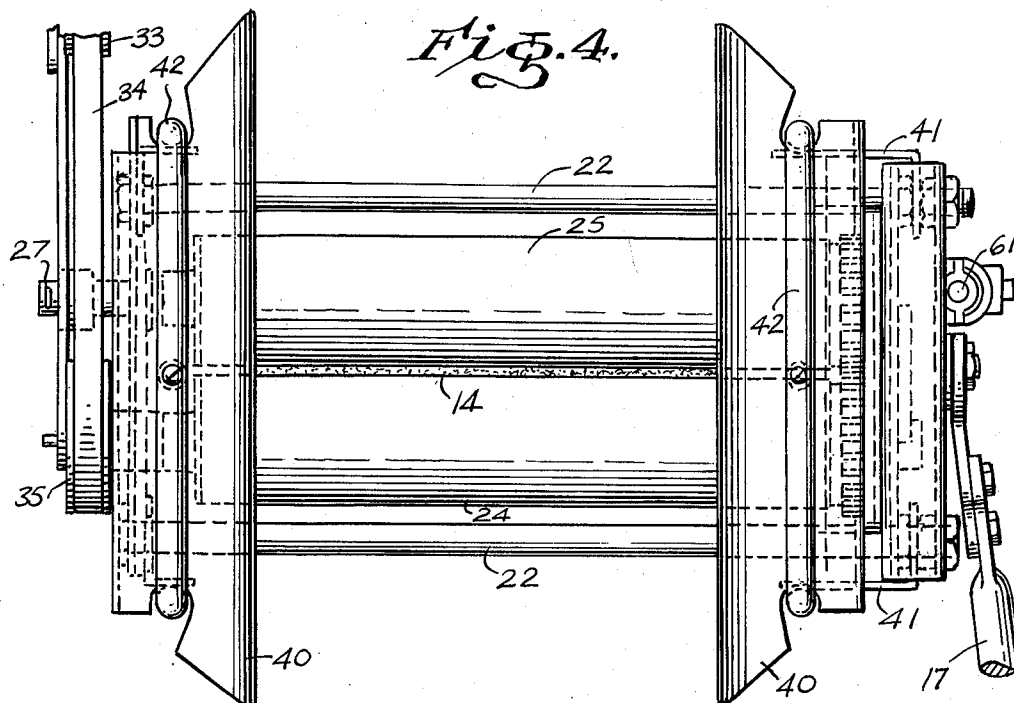
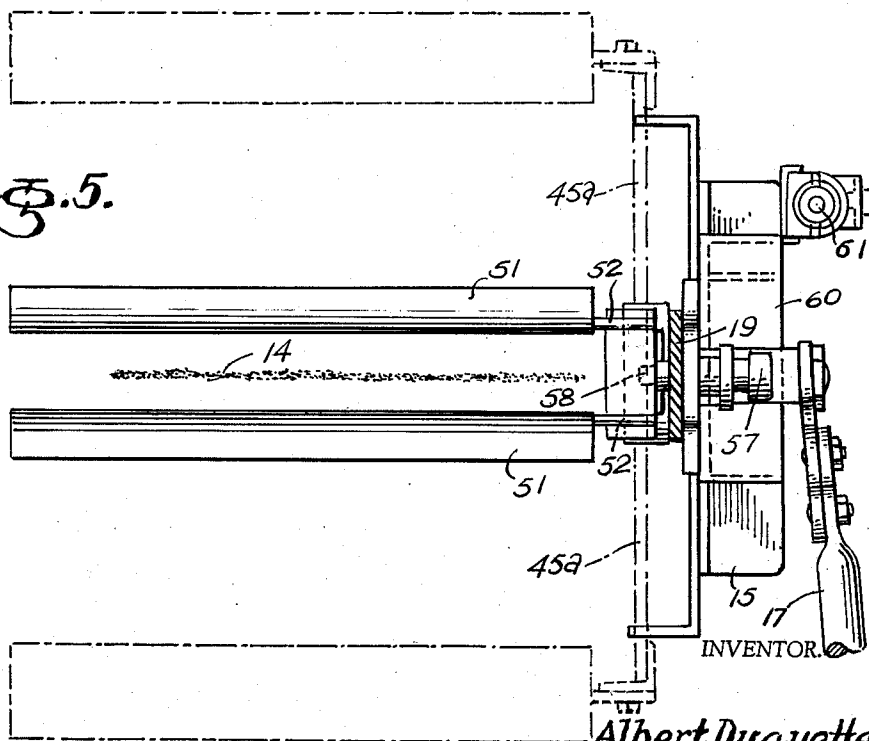


Fig. 5.



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Fig. 6.

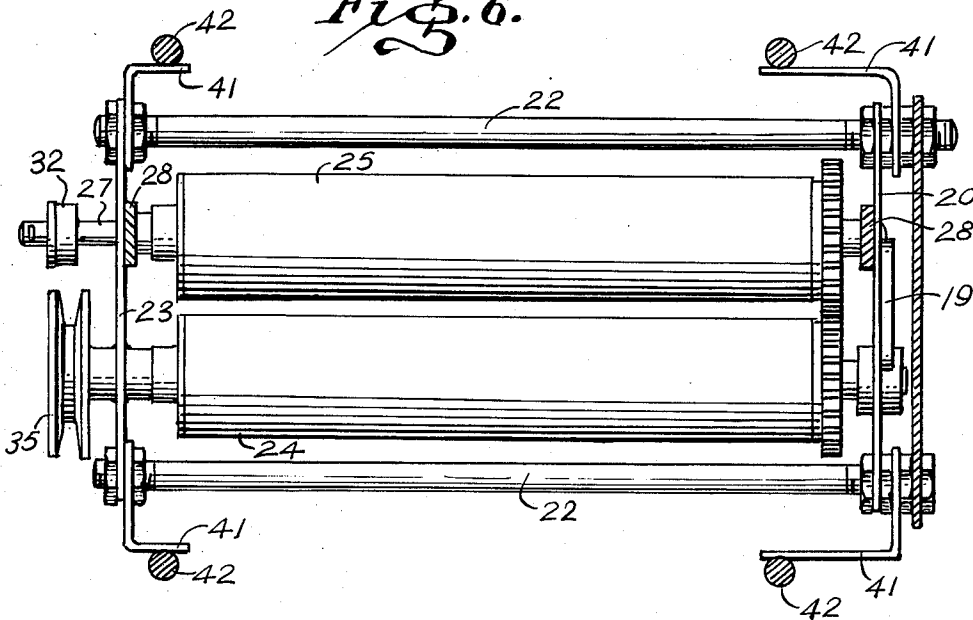


Fig. 7.

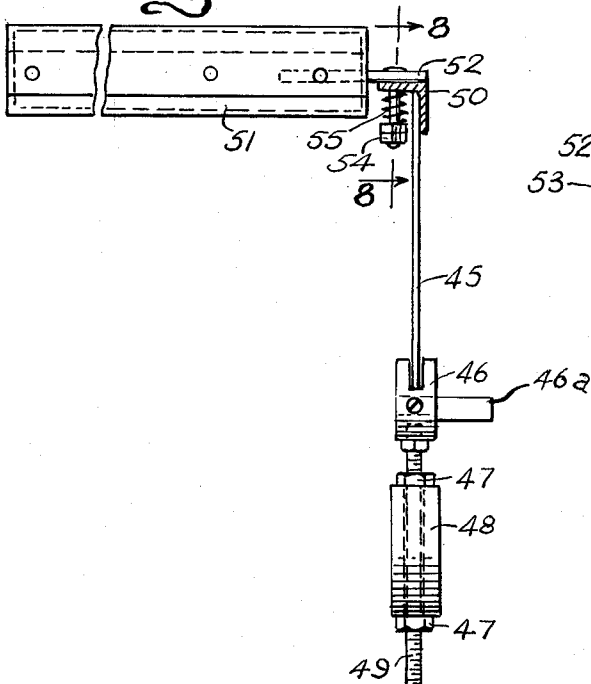
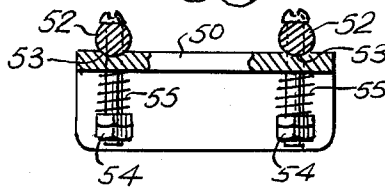


Fig. 8.



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CARD STOP FOR TEXTILE MACHINES

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Continuation of application Ser. No. 664,566, June 10, 1957. This application Mar. 28, 1962, Ser. No. 186,815
12 Claims. (Cl. 19—2)

This invention relates to textile machines and more particularly to woolen carding machines and is a continuation of my co-pending application, Serial No. 664,566, filed June 10, 1957.

It is an object of the present invention to provide a safety device for installation on woolen carding machines to stop the machines automatically when the card web breaks.

Another object of the present invention is to provide an automatic safety device for preventing plug-ups at the first breaker of such woolen carding machines, reduce waste, and improve production thereof.

A further object of the present invention is to provide a safety device of the above type having guide means for directing the web into the draw means of a carding machine and into association with a sensing mechanism for detecting a completely broken web.

A still further object of the present invention is to provide a safety device for woolen carding machines in which the sensing device is adjustably supported for pivotal movement between a running and a stopping position, so that in response to the detection of a broken web, the sensing device will automatically deenergize the drive mechanism of the carding machine, thereby minimizing loss of time and material.

Other objects of the invention are to provide a safety device for carding machines bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a vertical sectional view taken substantially on lines 1—1 of FIGURE 2 showing a safety device made in accordance with the present invention, in operative use, adjacent end portions of roll 24 being shown therein to more clearly illustrate the driving arrangement;

FIGURE 2 is a right-hand side elevational view of the device shown in FIGURE 1, or front view;

FIGURE 3 is a view similar to FIGURE 2, showing the left hand side elevation of FIGURE 1, or front view of a control arm being shown in one of two inoperative positions;

FIGURE 4 is a top plan view of the device shown in FIGURE 1;

FIGURE 5 is a horizontal cross sectional view taken along lines 5—5 of FIGURE 2;

FIGURE 6 is a horizontal sectional view taken along line 6—6 of FIGURE 2;

FIGURE 7 is a partial elevational view of the sensing device as shown in FIGURE 1; and

FIGURE 8 is an enlarged cross sectional view taken along the line 8—8 of FIGURE 7.

As is well known when dealing with woolen carding machines, various grades of wool are blended together ahead of the first card breaker section. This blend is known as stock. As the stock progresses along in the carding machine it is continuously being drawn, and therefore the stock is often called "drawing." This "drawing" has the form of a web as it passes from one card section to the next. At times the stock is fed too meagerly to the first card breaker section causing a very thin web which

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will break at the center draw intermediate section, thereby stopping the carding machine when the sensing mechanism, in accordance with the invention, fails to be held vertically by the web, and falls to position 45a, FIGURE 3. To be operative, the sensing mechanism must pivot and the weight of the control arm above the pivot point must be greater than the counter-weight 48. Also, in normal operation, the end of the control arm comprising the stock engaging arms must be located above the pivot point and the end consisting of the counter-weight must be located below the pivot point.

Referring now more in detail to the drawings, the safety device made in accordance with the present invention is shown in operative association being located between the first card breaker section and the second card breaker section at the discharge of the center draw intermediate feed overhead conveyor of a woolen carding machine, the web 14 thereof passing into operative association with the safety apparatus.

This device includes a base or front end stand 15 that may be secured, such as by screws or bolts, to the carrier of the overhead conveyor. A tie rod 17 is also attached to the overhead conveyor to maintain a constant distance between the conveyor and the draw rolls 24 and 25 thereby keeping the web 14 under constant tension. An upwardly extending standard 19 is integral at its lower end with the base 15 and is provided with an upper bearing bracket 20 at its upper end. This bracket 20 supports a pair of transversely extending rods 22 which, at the opposite ends, support a similar bearing bracket 23. As is shown in FIGURE 6, the brackets 20, 23 rotatably support a pair of draw rolls 24, 25, one of which is a driving roll 24 and the other of which 25 is driven thereby. As is more clearly shown in FIGURE 2, a tension device 28 is secured to the bearings at each end of the draw roll 25 normally urging the roll 25 toward the roll 24 by a tension spring 26, so as to positively engage the web 14 drawn therebetween.

As is shown in FIGURES 4 and 6, the stud 27 supports a belt tensioning arm 32 which, in turn, supports a lower tension belt arm 29 that is provided with an elongated slot 30. A bolt and nut 31 carried by the upper arm 32 extends through the slot 30 for securing the lower arm in an adjusted position relative thereto. The lower extremity of the lower arm 29 is provided with a pulley 33 around which a belt 34 is trained for engagement with an upper pulley 35 secured to the shaft 36 of the driving roller 24. The belt 34 constitutes the driving means for the roll 24.

The brackets 20, 23 also support arcuate rods 42 that support stock guides 40 by means of brackets 41. These stock guides 40 direct the web 14 through the gap between the draw rolls, then to the sensing device therebelow for detecting a complete break of the stock or drawing.

The sensing mechanism includes a control arm 45 that has a substantially centrally located pivoting support 46 which is rotatably supported upon the vertical standard 19. The lower end of the control arm 45 is in the form of a threaded stud 49 upon which a counter-weight 48 is slidably supported. Upper and lower lock nuts 47 provide adjustment means for locating the counter-weight 48 at any desired position along the length of the threaded stud 49. The opposite upper end of the control arm 45 is provided with a guide arm mounting bracket 50 to which a pair of stock engaging arms 51 are secured. As is clearly shown in FIGURE 8, the upper surface of the bracket 50 is provided with spaced depressions 53 which receive the rods 52 that are secured to the stock engaging arms 51 and are adjustably secured thereto by nuts and bolts 54 together with compression springs 55 which yieldably hold the rods 52 in their depressions but per-

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mit them to be swung apart. These springs 55 tolerate a certain amount of movement of the arms 51 without interfering with the alignment of the control arm relative to the base of the device.

With reference to FIGURE 1, it will be noted that a retractable lock plunger 57 is supported upon the vertical standard 19 and includes a pin 58 for reciprocating engagement with the control arm 45. This pin provides means for supporting the control arm assembly in the vertical position during assembly and adjustment, but is retracted out of engagement therewith during the normal use of the apparatus. The arm 45 is connected by means of the pivoting support 46 to an electrical switch 60 that has leads 61 which are associated with the drive mechanism of the carding machine. The switch 60 is so adjusted that upon rotation of the control arm 45 to one of two inoperative positions 45a, as shown in FIGURES 3 or 5, the electrical supply circuit to the drive mechanism will be opened, thereby stopping the operation of the machine.

With the safety mechanism arranged for use on the carding machine, as shown in FIGURE 1, the plunger 57 is withdrawn so as to retract the locking pin 58, whereupon the web 14 is operative to retain the control arm 45 in an upright position through engagement with the stock engaging arms 51. In the event that the web 14 is broken completely, the control arm 45 and its connected stock engaging arms 51 being heavier than the counter balancing effect of the weight 48, will fall to one side or the other of the pivot point as shown in FIGURES 3 or 5, turning a projecting shaft in the switch 60, actuating the switch. The pivot 46A of the pivoting support 46 is the projecting shaft of the switch 60. When this rotation has passed a predetermined point in either direction, the switch will be opened, cutting off the electrical power leading to the driving mechanism of the entire carding machine, stopping the entire carding machine. The broken web may then be examined, after which it may be passed through the safety device, whereupon the operation of the carding machine may be resumed.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

I claim:

1. A safety device for a woolen card textile machine comprising, in combination, a base, an upwardly extending standard secured to said base, stock guide means supported by said standard, stock draw means supported by said standard adjacent and beneath the said stock guide means, drive means for actuating said stock draw means, an electrical switch mounted upon said standard having leads associated with the drive mechanism of said machine, and sensing means, said sensing means carried beneath said stock guide means and stock draw means for detecting a completely broken web passing through said stock guide means and stock draw means, said sensing means comprising a control arm extending upwardly and provided with a support intermediate its ends pivotally mounted upon said standard, one end of said control arm located above the said pivotal support being disposed in the path of movement of said web, and the opposite end located beneath the said pivotal support including a counter-weight, the uppermost end of said control arm comprising of a pair of stock engaging arms for engagement by said web for maintaining said control arm in a substantially erect position during normal operation, and said uppermost end of said control arm being heavier than the lowermost end thereof to rotate to one side or the other of the pivotal support upon breakage of the web, the movement of said control arm about said pivotal support actuating said switch to stop said machine driving mechanism.

2. The combination according to claim 1, wherein said stock draw means comprises a pair of friction drive rolls for receiving the stock web therebetween and for moving

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said stock web toward said stock engaging arms of said control arm.

3. The combination according to claim 2, wherein said drive means comprises a pulley secured to one of said rolls, and a belt for effecting rotation of said pulley.

4. The combination according to claim 3, wherein said friction drive rolls are in meshing engagement with each other.

5. The combination according to claim 4, wherein one of said friction drive rolls comprises spring means for drawing said rolls toward engagement with each other.

6. The combination according to claim 5, further comprising belt tightening means for adjusting the tension of said drive belt.

7. A safety device for a woolen card textile machine comprising, in combination, a base, an upwardly extending standard secured to said base, stock guide means supported upon said standard, stock draw means supported by said standard adjacent and beneath the said stock guide means, drive means for actuating said stock draw means, an electrical switch mounted upon said standard having leads associated with the drive mechanism of said machine, a rotating shaft in said switch and projecting outwardly therefrom, and sensing means, said sensing means carried beneath said stock guide means and stock draw means for detecting a completely broken web passing through said stock guide means and stock draw means, said sensing means comprising a control arm extending upwardly and provided with a support intermediate its ends pivotally mounted upon said standard, one end of said control arm located above the said pivotal support being disposed in the path of movement of said web, and the opposite end located beneath the said pivotal support including a counter-weight, the uppermost end of said control arm comprising a pair of stock engaging arms for engagement by said web for maintaining said control arm in a substantially erect position during normal operation, and said uppermost end of said control arm being heavier than the lowermost end thereof to rotate to one side or the other of the pivotal support upon breakage of the web, the movement of said control arm about said pivotal support rotating said projecting shaft in said switch and actuating said switch to stop said machine driving mechanism.

8. A safety device for a woolen card textile machine comprising, in combination, a base, an upwardly extending standard secured to said base, stock guide means supported upon said standard, stock draw means supported by said standard adjacent and beneath the said stock guide means, drive means for actuating said stock draw means, an electrical switch mounted upon said standard having leads associated with the drive mechanism of said machine, and sensing means, said sensing means carried beneath said stock guide means and stock draw means for detecting a completely broken web passing through said stock guide means and stock draw means, said sensing means comprising a control arm extending upwardly and provided with a support intermediate its ends pivotally mounted upon said standard, one end of said control arm located above the said pivotal support being disposed in the path of movement of said web, and the opposite end located beneath the said pivotal support including an adjustable balance means, said balance means comprising a counter-weight, and screw means for adjusting the position of said counter-weight relative to said pivotal support, the uppermost end of said control arm comprising a pair of stock engaging arms for engagement by said web for maintaining said control arm in a substantially erect position during normal operation, and said uppermost end of said control arm being heavier than the effect of said balance means to rotate to one side or the other of the pivotal support upon breakage of the web, the movement of said control arm about said pivotal support actuating said switch to stop said machine driving mechanism.

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9. A safety device for a woolen card textile machine comprising, in combination, a base, an upwardly extending standard secured to said base, stock guide means supported upon said standard, stock draw means supported by said standard adjacent and beneath the said stock guide means, drive means for actuating said stock draw means, an electrical switch mounted upon said standard having leads associated with the drive mechanism of said machine, a rotating shaft in said switch and projecting outwardly therefrom, and sensing means, said sensing means carried beneath said stock guide means and stock draw means for detecting a completely broken web passing through said stock guide means and stock draw means, said sensing means comprising a control arm extending upwardly and provided with a support intermediate its ends pivotally mounted upon said standard, one end of said control arm located above the said pivotal support being disposed in the path of movement of said web, and the opposite end located beneath the said pivotal support including an adjustable balance means, said balance means comprising a counter-weight, and screw means for adjusting the position of said counter-weight relative to said pivotal support, the uppermost end of said control arm comprising a pair of stock engaging arms for embracing said web for maintaining said control arm in a substantially erect position during normal operation, and said uppermost end of said control arm being heavier than the effect of said balance means to rotate to one side or the other of the pivotal support upon breakage of the web, the movement of said control arm about said pivotal support rotating said projecting shaft in said switch, actuating said switch which opens an electrical supply circuit to said machine driving mechanism thereby stopping all action thereof.

10. A safety device for a woolen card textile machine comprising, in combination, a base, an upwardly extending standard secured to said base, stock guide means supported by said standard, stock draw means supported by said standard adjacent and beneath the said stock guide means, drive means for actuating said stock draw

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means, an electrical switch mounted upon said standard having leads associated with the drive mechanism of said machine, and sensing means, said sensing means carried beneath said stock guide means and stock draw means for detecting a completely broken web passing through said stock guide means and stock draw means, said sensing means comprising a control arm extending upwardly and provided with a support intermediate its ends pivotally mounted upon said standard, one end of said control arm located above the said pivotal support and including a pair of transverse, horizontally spaced members disposed to straddle the path of movement of said web, and the opposite end located beneath the said pivotal support including a counter-weight, the uppermost end of said control arm further comprising a pair of stock engaging arms secured to said members for engagement by said web for maintaining said control arm in a substantially erect position during normal operation, and said uppermost end of said control arm being heavier than the lowermost end thereof to rotate to one side or the other of the pivotal support upon breakage of the web, the movement of said control arm about said pivotal support actuating said switch which opens to stop said machine driving mechanism.

11. The safety device of claim 10 in which there is a resilient connection between one end of the web-straddling members and the uppermost end of the control arm.

12. The safety device of claim 10 in which there is a bracket at the upper end of the control arm having parallel recesses, and each of the web-straddling members includes a rod resiliently clamped in a respective one of said recesses.

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