

June 9, 1925.

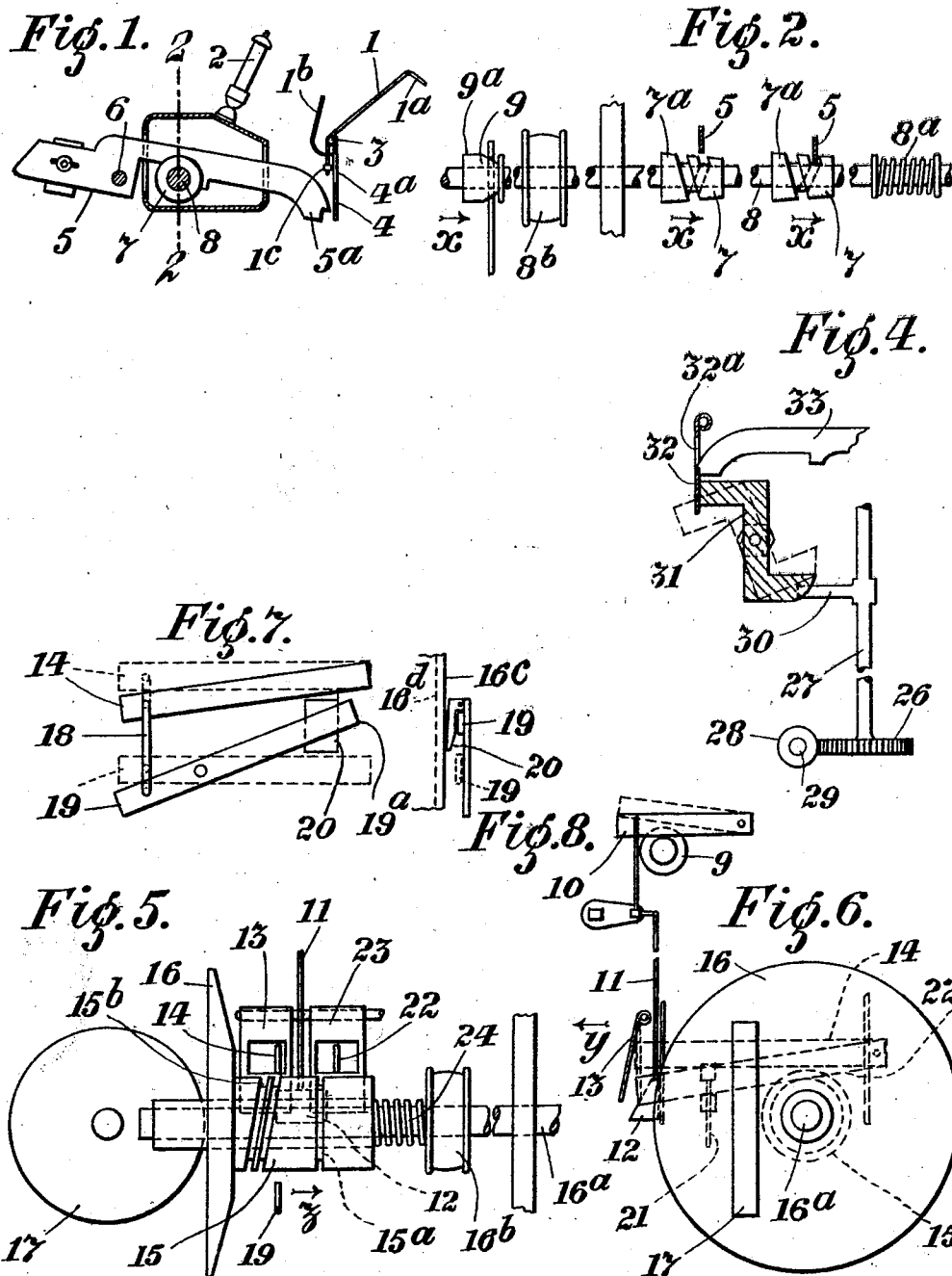
1,541,548

T. WILSON ET AL

STOP MOTION

Filed May 19, 1923

3 Sheets-Sheet 1



Thomas Wilson & Archibald Wilson, INVENTORS
per Wiedersheim & Fairbanks. ATTORNEYS.

June 9, 1925.

1,541,548

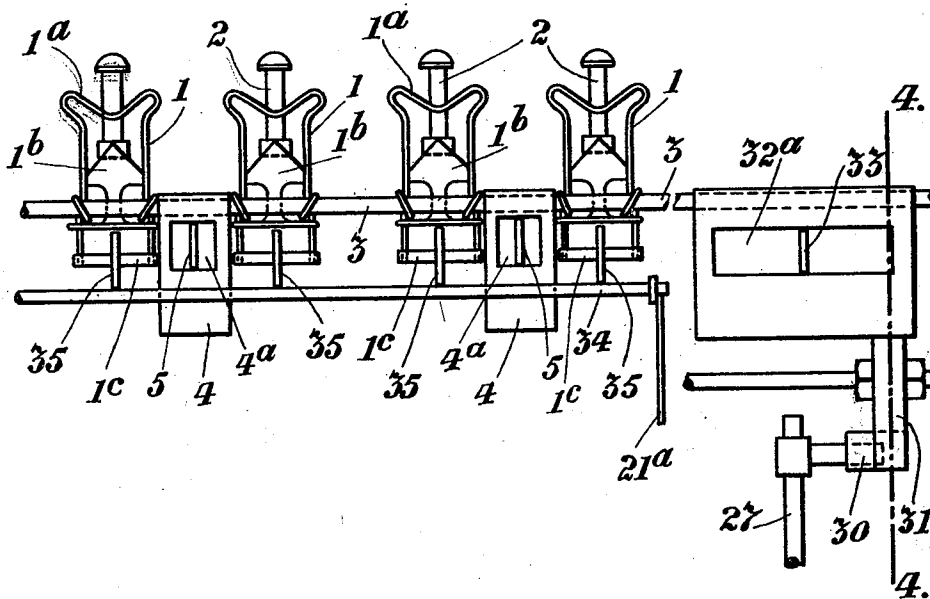
T. WILSON ET AL

STOP MOTION

Filed May 19, 1923

3 Sheets-Sheet 2

Fig. 3.



June 9, 1925.

1,541,548

T. WILSON ET AL

STOP MOTION

Filed May 19, 1923

3 Sheets-Sheet 3

Fig. 9.

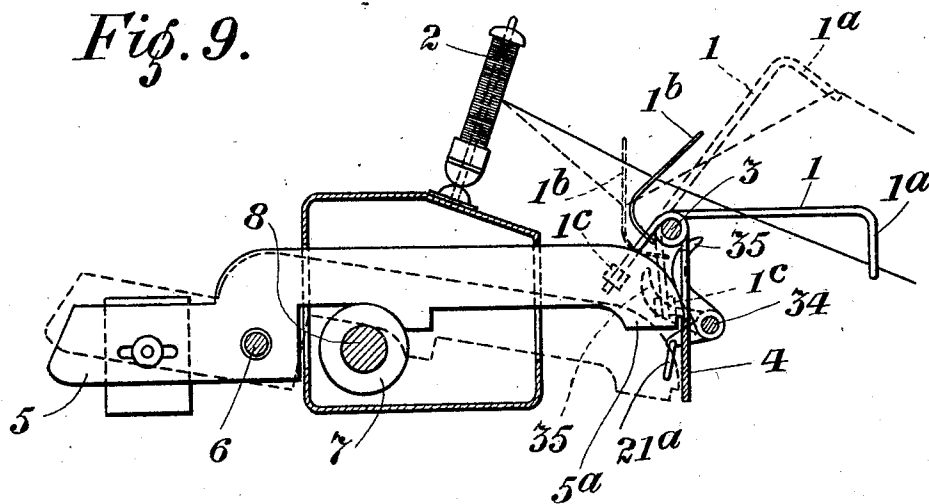
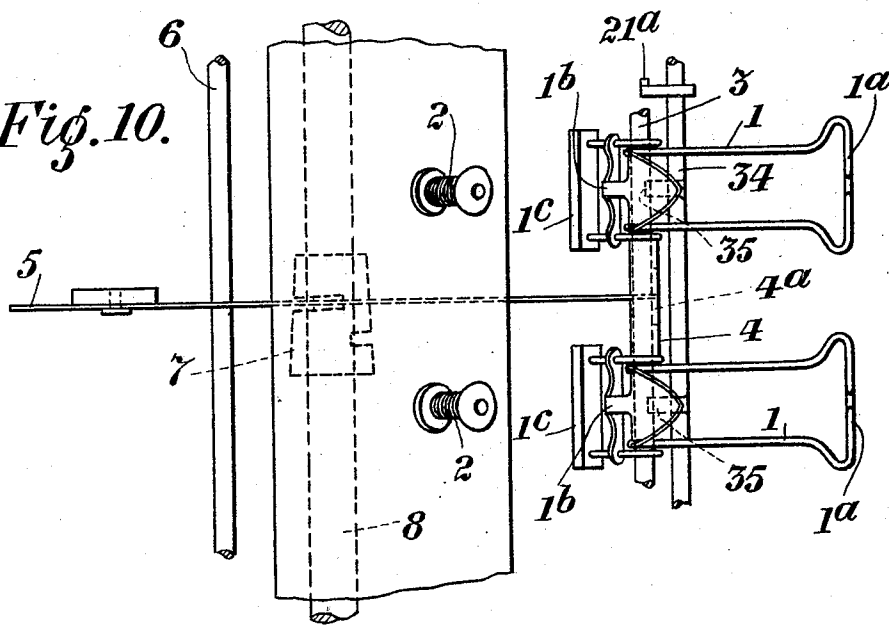


Fig. 10.



Thomas Wilson & Archibald Wilson, INVENTORS
per Wiederheim & Fairbanks ATTORNEYS.

UNITED STATES PATENT OFFICE.

THOMAS WILSON AND ARCHIBALD WILSON, OF DOAGH, IRELAND.

STOP MOTION.

Application filed May 19, 1923. Serial No. 640,000

To all whom it may concern:

Be it known that we, THOMAS WILSON and ARCHIBALD WILSON, both of The Villa, Doagh, county Antrim, Ireland, both subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements Relating to Stop Motions, of which the following is a specification.

This invention relates to stop motions for machines for treating or dealing with yarn or thread or the like, for example, yarn reeling machines, yarn winding, doubling, and twisting frames, or any other machine for the treatment of yarn, thread, or the like, in which it may be desired to stop the machine automatically when the thread breaks or when the thread gives out, or when a predetermined amount of thread has passed a detector, or when a machine is started or operated in the absence of a thread or threads, or the like, or on any other necessary occasion.

Under our invention, means are provided whereby, on occasions when stoppage of the machine is desirable, such as on the breakage of a thread or threads, or when a predetermined length of thread has been dealt with, a member is released, either directly or indirectly, so as to cause same to move into engagement with an axially movable rotating worm or equivalent, and will impart an axial movement thereto, which movement, through suitable means, is used to automatically stop the machine. The movement of the worm, as hereinbefore described, may be used to give a corresponding movement to another worm, or cone, whereby a lever member is operated and, through suitable link, or other gear, causes another member to engage and move another axially movable rotating worm which, when so moved, will effect the necessary stoppage of the machine. In the case of a friction clutch or friction plate drive, for example, the last mentioned worm may be secured to the friction plate and the lever member which operates the worm may also be arranged to act as a brake. Of course other braking means may be provided if desired.

The invention will be described with reference to the accompanying drawings whereon:—

Fig. 1 shows an end elevation of the principal portion of the stop motion in accordance with the invention for a machine dealing with yarn or thread.

Fig. 2 is a corresponding front view of the shaft 8 and its worms and with the levers 5, 5, sectioned on the line 2—2, Fig. 1.

Fig. 3 is a front elevation showing the detector stop motion in the stopping position. This view also shows an arrangement for the automatic stoppage of the machine when a predetermined length of thread has passed.

Fig. 4 is a sectional view on the line 4—4, Fig. 3.

Fig. 5 is an elevation of a friction drive in which the friction plate is secured to a worm adapted to be operated by the stop motion in accordance with the invention.

Fig. 6 is an end view of Fig. 5 and also of Fig. 2 but drawn to a larger scale showing the connections between the first worm and the worm to which the friction plate is secured.

Fig. 7 is an end elevation showing a brake latch operated by the stop motion and Fig. 8 is a sectional view of same.

Fig. 9 is an enlarged end elevation corresponding to Fig. 1 and showing the detector stop motion in working position and stopping position.

Fig. 10 is a plan view corresponding to Fig. 9 and showing two detectors.

Referring to the drawings:—

The stop motion shown at Figs. 1 to 10 comprises a detector or thread balanced member 1 made with a portion 1^a bent to form a convenient rest for the yarn or thread as it passes from the bobbin 2 over the detector and in order to insure that the thread will keep the detector or balance member 1 in the required position while the thread is running properly from both top and bottom of the bobbin, or the like, an auxiliary thread guide or bearing member 1^b is provided. The detector 1 is turnably supported on a rod 3 and it is provided with a counter weight 1^c. On the rod 3 there is also turnably supported a plate 4 having an opening 4^a therein, and a counterweighted latch 5 pivotally supported on a rod 6 normally rests with its front end 5^a on the lower edge of the opening 4^a in the plate 4. When the thread gives out, or breaks, the counterweighted detector member 1 moves from the position shown in full lines in Fig. 9 (which is the working position of the detector) to the position shown in dotted lines, and in moving to the latter position the counter weight 1^c comes into

contact with, and moves the plate 4, so that the latch 5 is released and falls to the position shown in dotted lines. In this position the latch 5 engages a worm 7 which is in one with, or secured on a spindle 8 supported so as to be movable axially. The spindle 8 is driven through pulleys 8^b and 16^b by a band drive from the shaft 16^a. The engagement of the latch 5 with the corresponding worm 7 causes the latter to axially move the spindle 8 and all the worms thereon, whereby a conical member 9 on the end of the spindle 8 is caused to move in the direction of the arrow X from the position shown at Fig. 2 and the latch 10, which rests thereon, is raised from the position shown in this figure on to the top 9^a of the cone 9. The effect of raising the latch 10 is shown clearly at Fig. 6, the latch being moved up by the movement of the conical member 9 from the position shown in full lines to the position shown in dotted lines. In moving to its higher position the latch 10, through the link gear 11, raises a wedge 12 causing it to move the plates 13 and 23 in the direction of the arrow Y so that latches 14 and 22, normally supported by the plates 13 and 23 are allowed to drop into engagement with an axially movable worm 15 to which the friction plate 16 of the drive is secured, causing said worm 15 to be moved axially in the direction of the arrow Z and taking the plate 16 out of contact with the driving pulley 17 so that the machine is stopped. In order to ensure immediate stopping of the machine when the friction plate 16 is moved back, as described, the movement of the latch 14 may, as shown at Figs. 7 and 8, be used to bring the brake into action. For this purpose the latch 14 is connected by a link 18 with another latch 19 adapted to act on a brake pad 20, the arrangement being such, that the lowering of the latch 14 raises the end 19^a of the latch 19 from the dotted line position to the full line position shown in Figs. 7 and 8, the dotted line 16^a in Fig. 8 represents the back of the friction disc in driving position and the full line 16^c represents the back line of the disc in position for stopping and in contact with the brake pad 20 when the latter has been moved out by the raising of the end 19^a of the latch 19.

When the machine has been stopped it is made ready for restarting by the action of the groove of the worm 7 in automatically raising the latch 5 until it is on the flat portion 7^a of the worm 7 and again engaged by the lower edge of the opening 4^a in the plate 4, in which position, the worms 7 and spindle 8 are free from control, being then moved back to their original position, ready for restarting by the action of a spring 8^a on the spindle 8, said spring having been compressed by the movement of the worms

7 in the direction of the arrow X, and released when a latch, or latches reach the flat portion of the corresponding worm, or worms 7.

The latch 22 normally rests on the lower edge of the opening in the plate 23, from which it is also released by the raising of the wedge 12, and when the worm 15 is moved by the latch 14 in the direction of the arrow Z, the latch 22 falls into engagement with the groove 15^a and holds the worm 15 and plate 16 from movement and against the action of the spring 24. The groove of the worm 15 automatically resets the latch 14 as it moves axially, raising it to the top 15^b of the worm 15 and into engagement with the edge of the opening in the plate 13, in the same manner as described with reference to the latches 5. The latch 22 which holds the drive out of action may be raised and reset in the opening in the plate 23 to allow the spring 24 to react, and bring the friction plate 16 into contact with the driving pulley 17 to restart the machine. The raising of the latch 22 may be effected by means of a connection 21 to a foot board or other device.

In order to insure that the machine will not be restarted or operated in the absence of a thread or threads, or yarn, or the like, we provide a spindle 34 having projecting lever members 35 thereon normally sufficiently clear of the counter weights 1^e to enable them to engage the plates 4 for the purpose of releasing the latches 5 as described. The spindle 34 is connected with the footboard, or other device, by a connection 21^a, similar to the connection 21 which resets the latch 22, so that when the latter is reset for restarting and in the absence of yarn, or thread, or the like, in one, or more, of the detectors, the movement given to the detectors by the projecting lever members 35 will cause the detectors to swing back and release the corresponding latch or latches 5, with the result already described. When the footboard or other device, as previously mentioned, is pressed down it will reset the latch 22 as described and will operate the spindle 34 with the levers 35 attached thereto and when the footboard is released it will allow the connections 21, 21^a and levers 35 to revert to the normal position.

The stopping mechanism as hereinbefore described can be adapted for different machines dealing with yarn, or thread.

In the case of a reeling or other machine, where predetermined lengths of thread, or yarn, or the like, must be measured, the stop motion as described, can be used to stop the machine when a predetermined amount of thread has passed. For example on a reeling machine the usual bell wheel 26 on the lower end of the vertical spindle 27 is

actuated by a worm 28 on the end of the swift axle 29. A projection 30 on the spindle 27 (see Figs. 3 and 4) effects a movement of a lever 31 which, when moved, acts on a plate 32 and allows a latch 33 to fall into engagement with a worm such as 7 with the result described with reference to the action of the detector or thread balanced member 1. The latch 33 is reset in the same manner as the latches 5. The lever 31 may be moved as described at each revolution of the bell wheel, or its equivalent, or at any predetermined number of revolutions of the bell wheel, or its equivalent. The bell latch plate 32 is sufficiently long to allow for the traverse of the shifter bar of the machine, the lever 31 having only a swinging movement.

Having now fully described our invention what we claim and desire to secure by Letters Patent is:—

1. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, and means for effecting axial movement of the control spindle automatically on occasions when stoppage of the machine is desirable.

2. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, and means for effecting axial movement of the control spindle automatically whenever a thread or yarn breaks.

3. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, means for effecting axial movement of the control spindle whenever a thread or yarn breaks, a brake for the machine, and means for applying said brake simultaneously with the axial movement of the control spindle.

4. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, means for effecting axial movement of the control spindle automatically whenever a thread or yarn breaks, and means for preventing restarting of the machine in the absence of a thread or yarn.

5. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, means for effecting axial movement of the control spindle whenever a thread or yarn breaks, a brake for the machine, means for apply-

ing said brake simultaneously with the axial movement of the control spindle, and means for preventing restarting of the machine in the absence of a thread or yarn.

6. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, detectors engaging the threads or yarns, and means movable by a detector when the corresponding thread or yarn breaks to effect axial movement of the control spindle.

7. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, detectors engaging the threads or yarns, means movable by a detector when the corresponding thread or yarn breaks to effect axial movement of the control spindle, a brake for the machine, and means for applying said brake simultaneously with the axial movement of the control spindle.

8. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, detectors engaging the threads or yarn, means movable by a detector when the corresponding thread or yarn breaks to effect axial movement of the control spindle, a brake disc on the machine driving shaft, a pivoted member, a brake pad carried by said member, a plate constraining the member to a position to hold the pad normally out of engagement with the disc, and means for moving the plate to release the member when the control spindle is moved axially.

9. A stop motion for machines used in treating threads or yarns, comprising a control spindle adapted to be driven from the machine and movable axially to disconnect the machine from its driving source, means for effecting axial movement of the control spindle whenever a thread breaks, a brake for the machine, means for applying said brake simultaneously with the axial movement of the control spindle, a spindle, levers on said spindle, and means for moving said levers to hold the detectors inoperative in the absence of a thread or yarn to prevent the restarting of the machine.

10. A stop motion for machines used in treating threads or yarns, comprising a control spindle, a driving shaft for the machine, a worm wheel on said driving shaft, means for rotating the control spindle from the said shaft, means for effecting axial movement of the control spindle when a thread or yarn breaks, and means actuated by the control spindle on such axial movement to effect simultaneous axial movement

of the worm wheel on the driving shaft to disconnect the machine from its driving source.

11. A stop motion for machines used in treating threads or yarns, comprising a control spindle, a driving shaft for the machine, means for rotating the control spindle from the said shaft, means for effecting axial movement of the control spindle when a thread or yarn breaks, a worm wheel on the driving shaft, spring means constraining said worm wheel in one direction on the driving shaft, a friction disc on said worm wheel and means actuated upon axial movement of the control spindle to engage said worm wheel and effect simultaneous axial movement of the worm wheel against the action of said spring means in order to disconnect said friction disc from its driving source.

12. A stop motion for machines used in treating threads or yarns, comprising a control spindle, a driving shaft for the machine, means for rotating the control spindle from the said shaft, means for effecting axial movement of the control spindle when a thread or yarn breaks, a worm wheel on the driving shaft, spring means constraining said worm wheel in one direction on the driving shaft, a friction disc on said worm wheel, a latch member for engaging said worm wheel to effect axial movement of the worm wheel, a plate constrained to hold said latch member normally out of engagement with said worm wheel, and means actuated by the control spindle to swing said plate clear of the latch member, said latch member when thus released engaging said worm wheel to effect simultaneous axial movement of the worm wheel against the action of said spring means to disconnect the said friction disc from its driving source, and means for holding said friction disc out of engagement therewith.

13. A stop motion for machines used in treating threads or yarns, comprising a control spindle, a driving shaft for the machine, means for rotating the control spindle from said shaft, means for effecting axial movement of the control spindle when a thread or yarn breaks, a worm wheel on the driving shaft, a compression spring on the driving shaft, a friction disc on said worm wheel, a latch member for engaging said worm wheel to effect axial movement of the worm wheel against the action of said spring, a latch member for engaging said worm wheel on the axial movement thereof, a plate constrained to hold said latch member normally out of engagement with the worm wheel, and means actuated by the control spindle to swing said plate clear of the latch member, said latch member when thus released engaging the worm wheel to hold the friction disc out of engagement with its driving source.

14. A stop motion for machines used in treating threads or yarns, comprising a control spindle, a driving shaft for the machine, a worm wheel on said driving shaft, means for rotating the control spindle from said shaft, means for effecting axial movement of the control spindle when a thread or yarn breaks, means actuated by the control spindle on such axial movement to effect simultaneous movement of the worm wheel on the driving shaft to disconnect the machine from its driving source, and means for effecting the return axial movement of the worm wheel to re-set the machine.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS WILSON.
ARCHIBALD WILSON.

Witnesses:

ANDREW HAMILTON,
HARRY WALTER ALLSOP.