

No. 776,445.

PATENTED NOV. 29, 1904.

F. WILCOMB.
STOP MOTION KNITTING MACHINE.

APPLICATION FILED NOV. 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

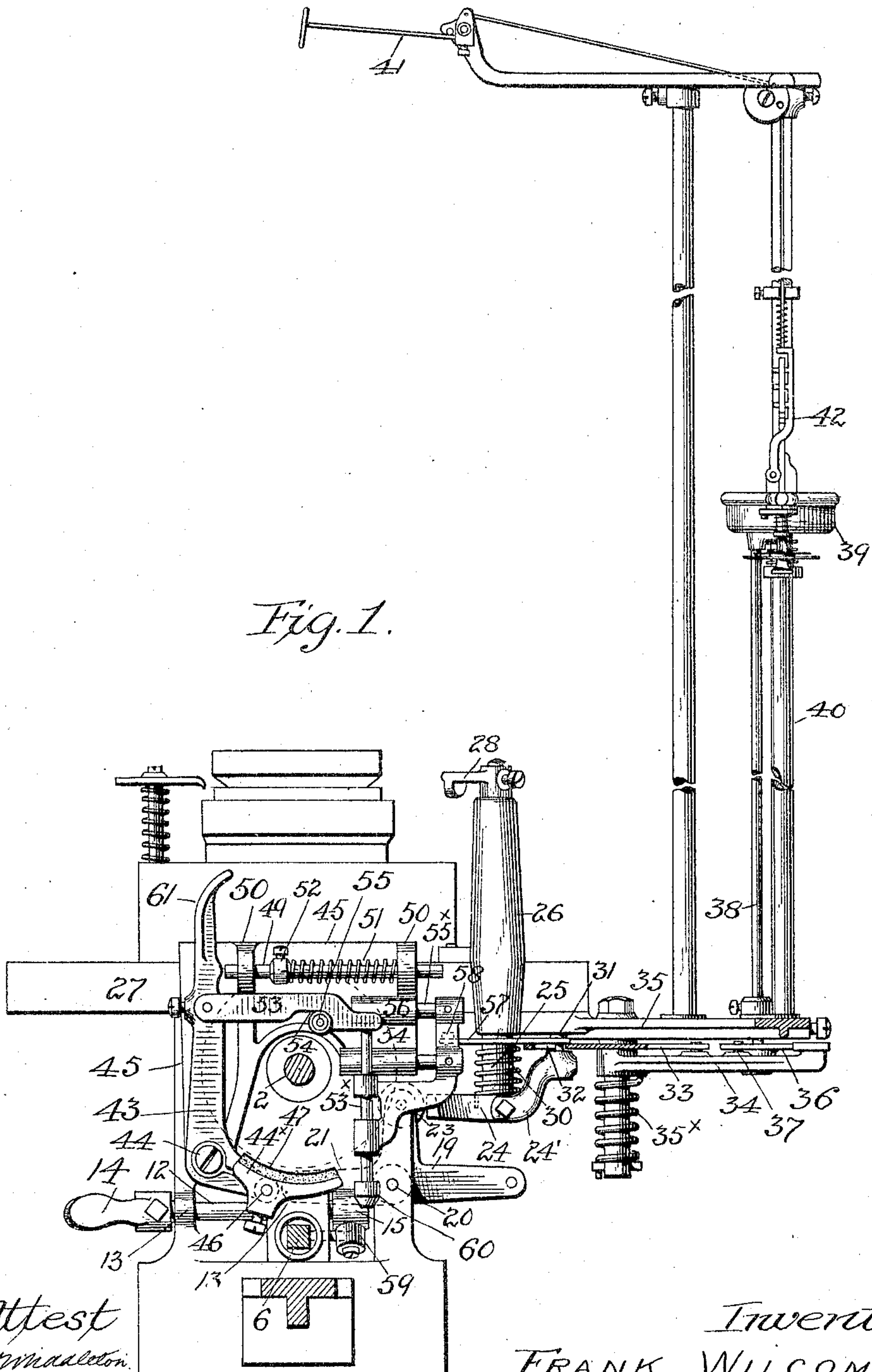


Fig. 1.

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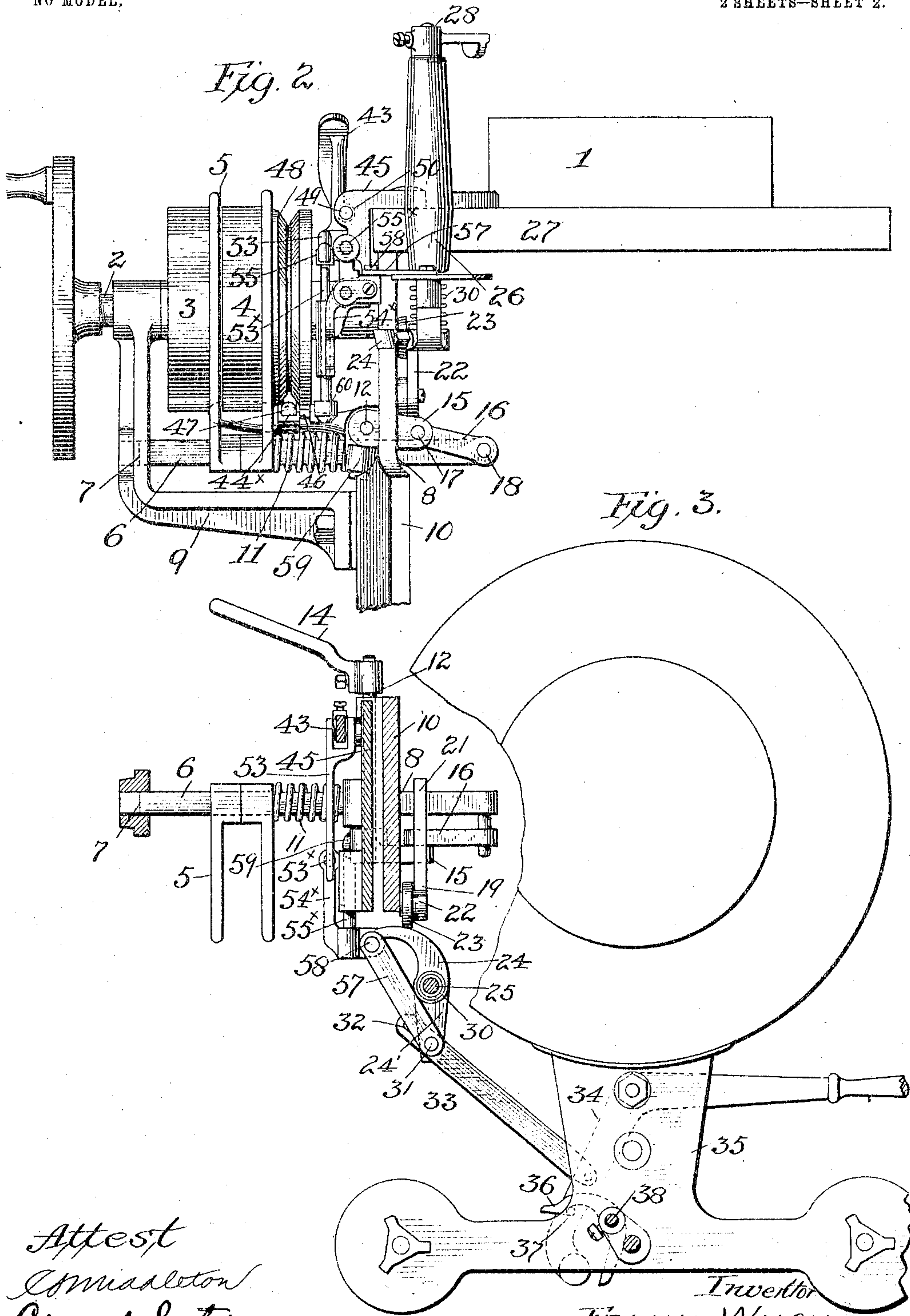
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UNITED STATES PATENT OFFICE.

FRANK WILCOMB, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR TO H. C. COLEMAN, OF NORRISTOWN, PENNSYLVANIA.

STOP-MOTION KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 776,445, dated November 29, 1904.

Application filed November 2, 1903. Serial No. 179,647. (No model.)

To all whom it may concern:

Be it known that I, FRANK WILCOMB, a citizen of the United States, residing at Norristown, Pennsylvania, have invented certain new and useful Improvements in Stop-Motion Knitting-Machines, of which the following is a specification.

It is the object of my invention to provide means whereby the stop-motion disclosed in Letters Patent of the United States No. 698,090, granted me on the 22d day of April, 1902, may be applied to an existing type of knitting-machine, though it will be understood that I do not wish to limit myself to the use of the said means to its combination with the stop-motion referred to, as other forms of stop-motions might be desired to take the place of the one mentioned.

The invention consists in the features and combination and arrangement of parts hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of a knitting-machine of known form with my improvements in place thereon, some of the parts being shown in section. Fig. 2 is a view looking from the right of Fig. 1 with parts omitted; and Fig. 3 is a plan view of the invention applied to a knitting-machine, parts being broken away and parts being shown in section.

I will first describe the parts of the knitting-machine which are old and well known and with which my invention is associated.

1 is a knitting-head, and 2 the shaft for driving the rotary part of said head. This drive-shaft carries fast and loose pulleys 3 4. The shifting of the belt is done by a shipper-fork 5, carried by a rod 6, arranged to slide in bearings at 7 8 in the bracket 9 and side frame 10, respectively. A spring 11, surrounding the shipper-rod 6 and arranged between the shipper-fork and the side frame, constantly tends to move the shipper-rod, with the shipper-fork, toward the left, Fig. 2, and thus keep the belt on the loose pulley. In order to shift and hold the belt on the fast pulley 4 against the tension of the spring, the machine mentioned is provided with a rock-shaft 12, journaled in

bearings 13 on the side frame of the machine, said rock-shaft being operated by a handle 14 and having fixed thereon an arm 15, connected by a link 16 with the sliding shipper-rod 6, said link being pivoted to the said arm and the said shipper-rod. The arrangement of parts is such that when the hand-lever 14 is turned down into the position indicated in the drawings, and the arm 15 is consequently in its raised position, the pivot-joint between the arm and link—*i. e.*, at 17—will be slightly above a line drawn through the center of the rock-shaft 12 and the center of pivot 18, and therefore the parts will be held in locked position, and the tendency of the spring will be to aid in this locking action. In order to shift the belt, the arm 15 is thrown downwardly far enough to carry the pivot 17 below the imaginary line above referred to, and the spring 11 being then free to act will move the shipper-rod leftward and shift the belt onto the loose pulley. For throwing the arm 15 down a lever 19 is provided in the machine referred to, said lever being pivoted to the side frame at 20 and having one arm 21 extending over the arm 15 near its joint with the link 16 and having also an arm 22 extending upwardly, to which in the machine suitable connections extend for controlling the let-off.

I will now describe my invention and so much of the stop-motion proper disclosed in said Letters Patent as will be necessary to a clear understanding of my invention.

On the upper end of the arm 22 a roller 23 is journaled, and adjacent to this roller a curved arm 24 is arranged, being fixed to the lower end of a rock-shaft 25, extending vertically and journaled in a standard 26, supported on the base-plate 27 of the knitting-head. This shaft at its upper end has an arm 28 secured thereto, provided with a finger arranged to be operated by a projection or arm on the knitting-head, which is thrown into line with the finger whenever bunches or knots occur at the needles. The arm 24 is under tension of a spring 30, fixed thereto at one end and at the other end fixed to the stationary standard 26. This spring returns the arm 24, together with the vertical rock-shaft 25 and arm 28, to normal posi-

tion. When the rock-shaft 25 is operated, as above described, by the arm 28, the curved arm 24 will turn the lever 19 and cause it to throw down the arm 15 by engaging the same at or near the joint between this arm and the link 16, and thus the machine will be stopped by the shifting of the belt.

The arm 24 has an extension 24', connected by a pin 31 and slot 32 with the link 33, connected to the power-lever 34 of the stop-motion proper, said power-lever being pivoted to the bracket 35 and being under the tension of a spring 35^x. This power-lever is controlled the same as in my patent referred to, by a trigger 36 engaging a pin 37 on the power-lever, said trigger being secured to the rock-shaft 38, which is operated from mechanism within the stop-motion head 39 on a standard 40, supported by the bracket 35. The mechanism within the head 39 is operated from either a sweep 41 when the thread gets caught or a knot or snarl occurs or by the feeler-finger 42 when the thread fails or loose end runs off the bobbin. The parts just described being fully disclosed in the patent referred to herein. It will be seen, however, that the curved arm 24 will be operated either by the arm 28, the sweep 41, or the feeler-finger 42, and each of these parts may operate the mechanism separately. The power-spring 35^x is stronger than the returning-spring 30, and thus overcomes said spring when the stop-motion is operated through the sweep or feeler-finger. When the arm 28 is operated, the arm 24 can move without moving the link 33, owing to the pin-and-slot connection described.

In order to provide means for stopping the machine quickly when the belt-shifting means are operated, I provide a brake-lever 43, pivoted at 44 to a bracket 45, secured to the base-plate of the knitting-head. This brake-lever has a brake-shoe 44^x pivoted thereto at 46, said brake-shoe having a leather or other suitable wearing part 47, arranged to engage the periphery of a pulley 48, attached to the fast pulley 4 and having a V-shaped groove, as shown in Fig. 2, said pulley being on the machine referred to and being employed to drive the fabric-take-up mechanism. This brake-lever is acted on by a rod 49, slidably supported in bearings 50 on the bracket 45 and under tension of a spring 51, acting on a collar 52, adjustably secured to the said rod. This spring-rod tends to set the brake-shoe against the groove-pulley, and in order to hold the brake off a gravity-latch 53 is pivoted to the brake-lever, the hook end 54 of which engages a pin 55, fixed on the bracket 45, and is held thereby. To set the brake, the latch is released from the pin by a rod 53^x, movable vertically through a carrier 54^x, which is supported and guided in its movement by pins 55^x on the carrier working in ways or

openings in bosses 56 on the bracket. This carrier is reciprocated by a rod or link 57, pivoted thereto at 58 and pivoted at its other end on the pin 31, so that whenever the arm 24 is operated by either the arm 28, the sweep 41, or the feeler-finger 42 and the belt-shipper mechanism is operated the carrier 54^x will be moved forward, carrying the vertically-movable rod 53^x over or in the path of a roller or stud 59 on the arm 15, before mentioned, so that the said rod will be lifted by the roller 59 striking it, and consequently the latch 53 will be raised from the pin 55, and the spring-rod 49 will turn the brake-lever to set the brake-shoe against the pulley. The vertically-movable rod is provided with a conical head 60 at its lower end to be struck by the said roller or stud. As long as the stop-motion remains in the condition just described—*i. e.*, not reset—it will be impossible to shift the belt to the fast pulley and allow the same to remain in this position, because the curved arm 24 will hold the lever 21 in position to prevent the rise of the arm 15 to its locked position. (Shown in Fig. 2.) It will be seen also that the setting of the brake takes place as a result of the shifting of the belt onto the loose pulley, so that there is no danger of setting the brake while power is still applied to the machine. The belt shifting and braking are done practically simultaneously. When the stop-motion parts are reset, the carrier 54^x, with the vertically-movable pin 53^x, is moved rearwardly, and the said vertically-movable rod is thus drawn from over the path of the stud or roller 59, and thus the shifting of the belt may be done by operating the hand-lever 14 without setting the brake or requiring the stop-motion parts to operate. The brake may be reset in inactive position by operating a hand-lever 61, forming an extension of the brake-lever.

It will be seen that my invention is especially designed to be applied to a type of machine having the pulleys, as shown, and the belt-shifting mechanism, and in carrying out the improvement it has been made to fit into the machine without altering the form or arrangement of the parts in so far as those parts are used in the present invention.

While herein I use the term "pulley," this is to be understood as meaning any suitable braking-surface against which a brake-shoe may act.

The machine with which my invention is to be combined is that well-known as the "Brinton."

The stop-motion which has been previously disclosed by me in Letters Patent of the United States includes those parts lying between the sweep 41 and the rock-shaft 25, inclusive, and also the arm 28.

The belt-shifting fork is representative of any suitable let-off device which will accomplish a substantially equivalent result—*i. e.*,

disconnect the machine from its driving power. The brake-shoe is also representative of any substantially equivalent brake device.

I claim—

5 1. In combination, a let-off device, a brake device, stop-motion mechanism, connections between the said stop-motion mechanism and the let-off device, connections between the stop-motion means and the brake device to
10 be operated partly by the stop-motion means and partly by the connections first mentioned, substantially as described.

2. In combination with a let-off device, a brake device, stop-motion mechanism, connections to be operated thereby and extending to
15 the let-off device and means arranged independently of the let-off connections for operating the brake device from the said let-off connections, said means being normally out
20 of the range of movement of the said let-off connections, and being moved into the range of movement of the said connections by the said stop-motion mechanism, substantially as described.

25 3. In combination with a let-off device, operating connections leading thereto, a brake device, a shifting device movable alongside the machine adapted, when in one position to be operated by the said let-off connections
30 to operate the brake device, and while in the other position to allow the let-off connections to be operated without actuating the brake device and means for automatically shifting the said device, substantially as described.

35 4. In combination with a brake device, and with a let-off device, operating connections leading to the let-off device, a shifting device consisting of a pin for operating the brake device from the let-off connections, a movable carriage for the said pin holding said pin
40 when in normal position out of line with the let-off connections so that the latter may be operated alone, and means for operating the said carriage to make the pin aline with the
45 let-off connections to thereby operate the brake, substantially as described.

5. In combination with a let-off device, connections for operating the same, a brake device, a shifting device adapted to operate the
50 brake device from the let-off connections, said shifting device when in one position allowing the let-off connections to be operated alone, and when in the other position actuating the brake device from the let-off connections, and
55 stop-motion means, including devices arranged to operate the let-off connections and simultaneously move the shifting device in position to operate the brake from the let-off connections, substantially as described.

60 6. In combination, a brake-lever pivotally supported and having an arm carrying a brake-

shoe and an upwardly-extending arm, a latch pivoted to the said upwardly-extending arm and reaching over the shaft, a stud with which
said latch engages, a pin extending vertically
65 on the side of the shaft opposite that upon which the brake-lever is located, a movable carriage for the said pin, let-off connections arranged to operate the said pin, and means
70 for operating the said let-off connections and moving the carriage, substantially as described.

7. In combination, a let-off device, connections thereto including a rock-shaft and an arm, stop-motion mechanism for operating
75 the said connections, a brake device, a pin for operating the brake device, a movable carrier for the pin operated from the stop-motion mechanism, and a stud on the arm of the rock-shaft to operate the said pin, substantially as
80 described.

8. In combination with a brake-shoe, a latch and a vertically-arranged pin for releasing the latch and a movable carriage for the pin, a
let-off device, connections thereto comprising
85 an arm arranged to rotate about a center and a stud on the arm arranged to operate the vertical pin, substantially as described.

9. In combination with brake mechanism, comprising means carrying a brake-shoe, a
90 latch and a vertically-arranged pin for releasing the latch and a movable carriage for the pin, let-off mechanism comprising a shipper-rod, an arm arranged to rotate about a center, a link connecting the said arm with the ship-
95 per-rod, and a stud on the arm, substantially as described.

10. In combination in a stop-motion for knitting-machines, a brake-lever arranged on one side of the main shaft of the machine,
100 means for throwing the said brake-lever into operation, a latch for restraining the said lever and means for releasing the latch comprising a movable carrier and connections thereto from the detector devices, substan-
105 tially as described.

11. In combination in a stop-motion for knitting-machines, a brake-lever arranged upon one side of the main shaft of the machine,
110 means for throwing said lever into operation, a latch for restraining the said lever, a pin arranged on the side of the shaft opposite to that upon which the brake-lever is operated, a movable carrier for the said pin and connections to the carrier from the detector de-
115 vices, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK WILCOMB.

Witnesses:

HENRY I. FOX,
MABEL L. EVANS.