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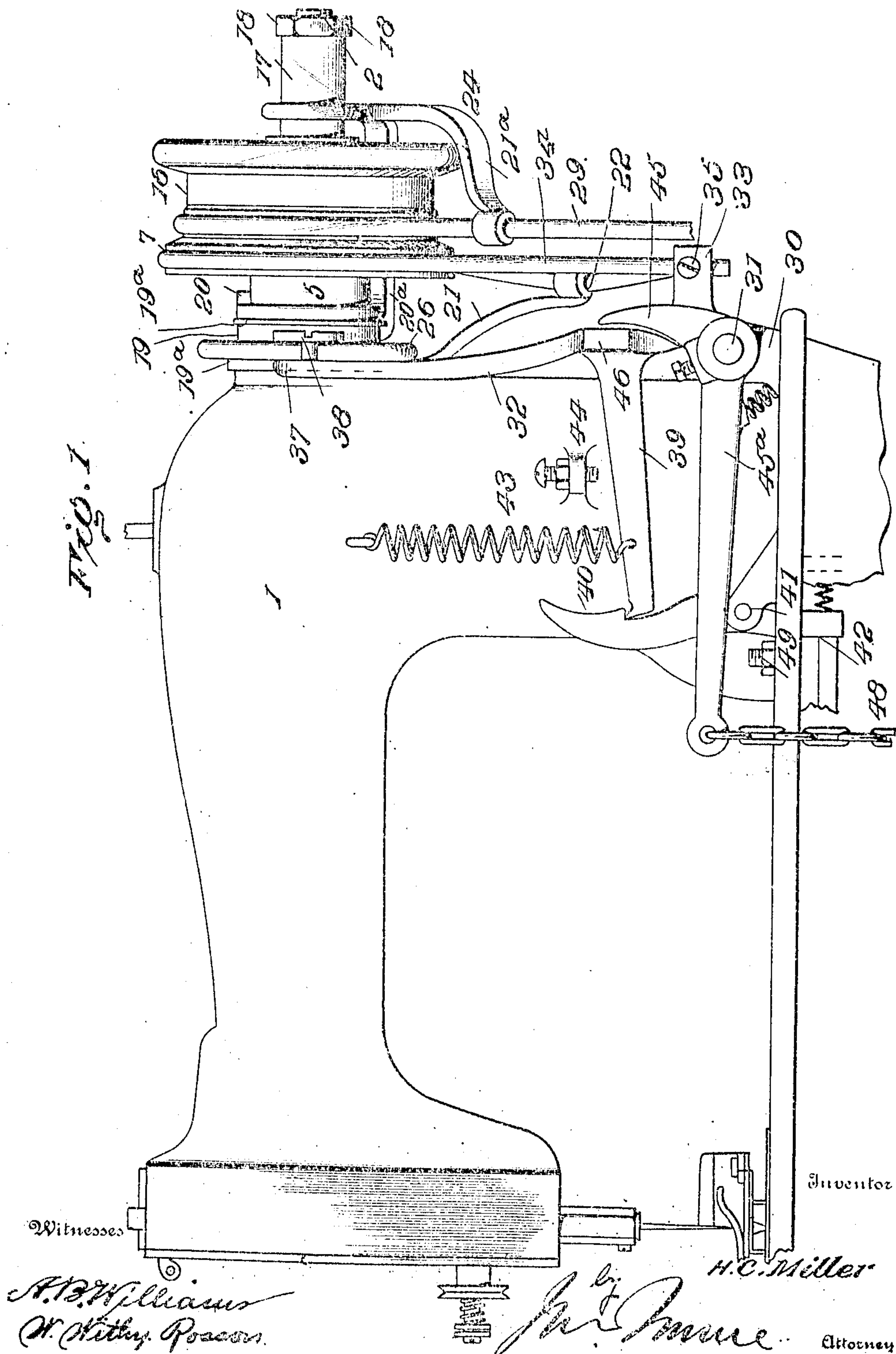
PATENTED JAN. 7, 1908.

H. C. MILLER.

STOPPING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED MAY 26, 1905. RENEWED JULY 31, 1906.

4 SHEETS—SHEET 1.



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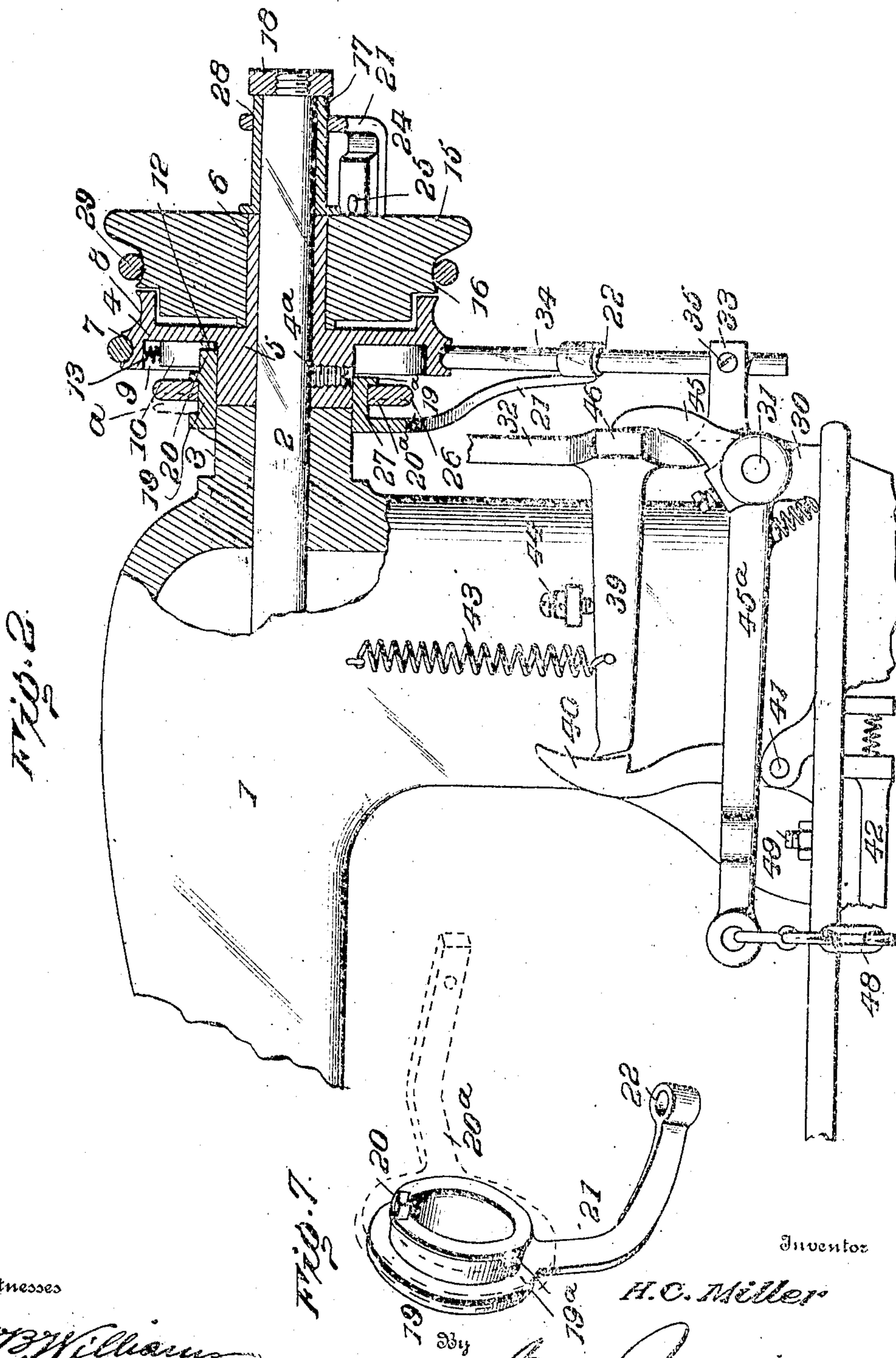
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4 SHEETS—SHEET 2.



Witnesses

Wm. Williams
Wm. Kelly

Inventor

H. C. Miller

Wm. Miller

Attorney

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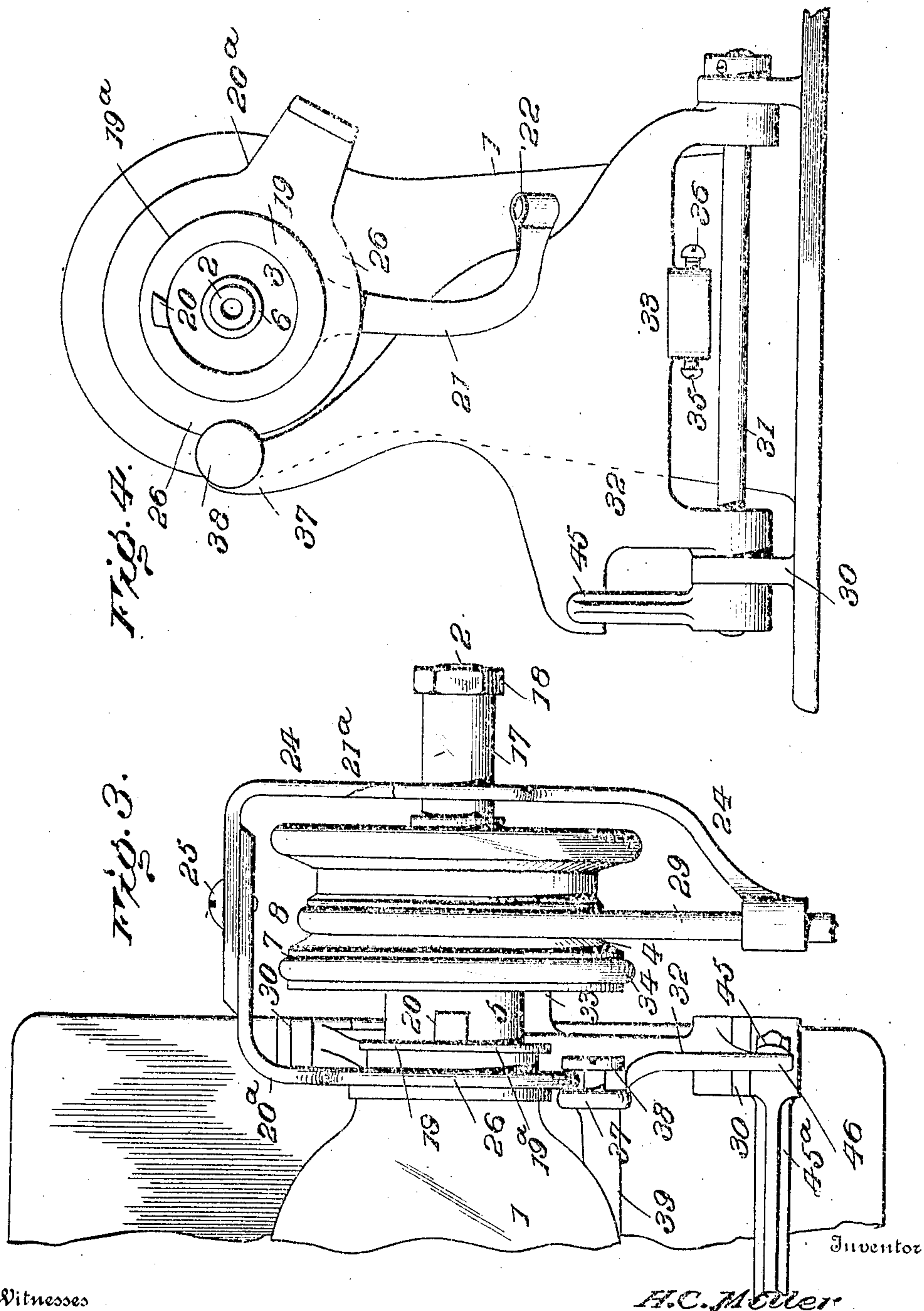
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4 SHEETS—SHEET 3.



Witnesses

A. B. Williams
H. Withy. Rossom.

A.C. Miller

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By *H. H. H. H.*

Attorney

No. 876,211.

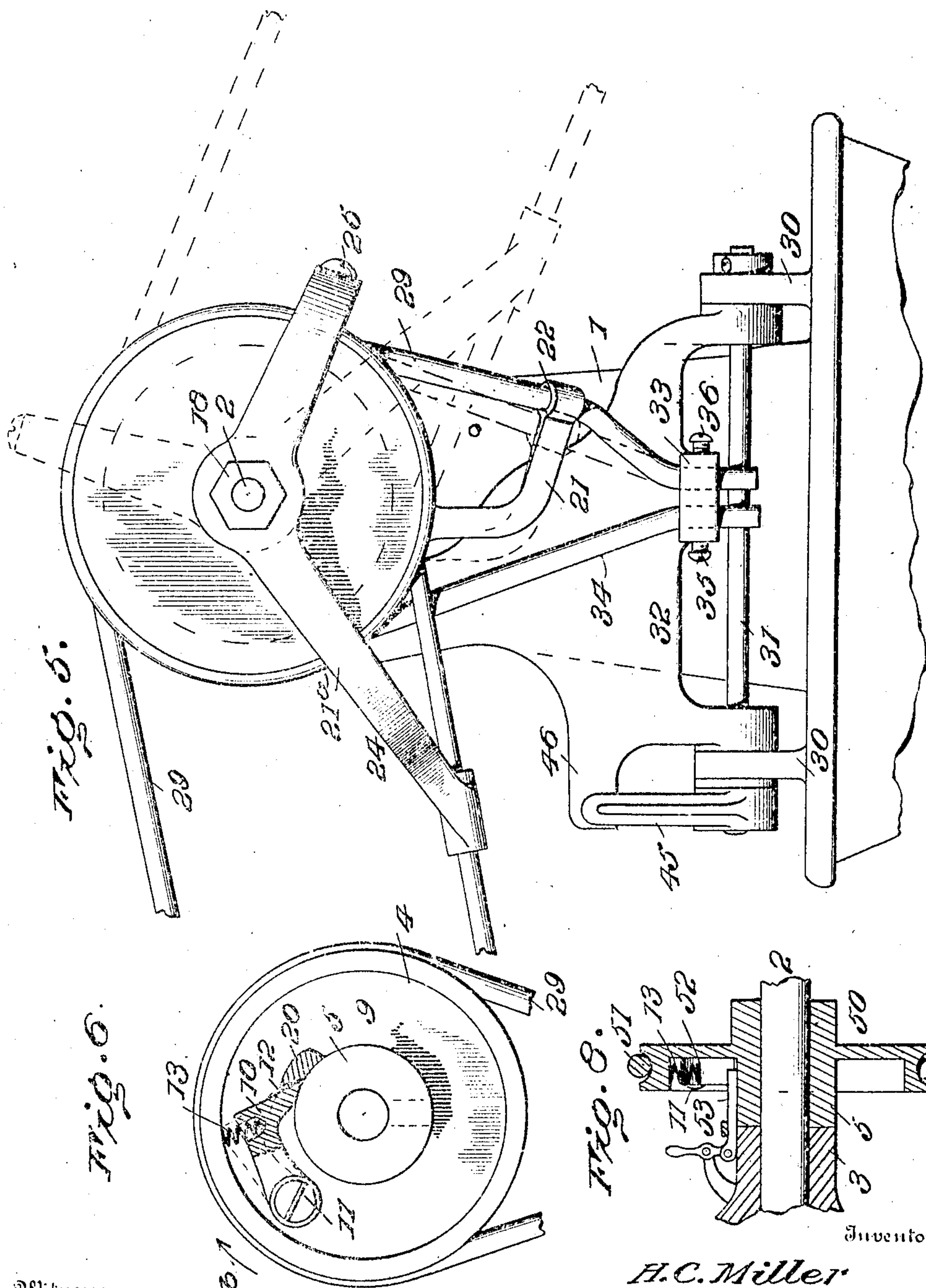
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4 SHEETS—SHEET 4.



Witnesses

H. B. Williams
H. M. R. R. R.

By

H. C. Miller
J. M. M.
Attorney

UNITED STATES PATENT OFFICE.

HENRY C. MILLER, OF WATERFORD, NEW YORK

STOPPING MECHANISM FOR SEWING-MACHINES.

No. 876,211.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed May 26, 1905, Serial No. 262,401. Renewed July 31, 1906. Serial No. 328,620.

To all whom it may concern:

Be it known that I, HENRY C. MILLER, a citizen of the United States, residing at Waterford, in the county of Saratoga and State of New York, have invented new and useful Improvements in Stop Mechanism, of which the following is a specification.

This invention relates to improvements in stopping mechanism for sewing machines.

Numerous attempts have been made to produce a stopping mechanism, which will positively stop the needle of a sewing machine above the fabric without jarring or causing undue wear on the stitching mechanism, irrespective of the speed of the machine. All such constructions known to me, fail absolutely to meet the practical requirements of the trade, primarily because the final stopping means comes into operation with such force as to vibrate, and hence disarrange the delicate and intricate parts of the sewing mechanism. Under these conditions the final stop will, in due time, take place at a period when the needle is down in the material.

According to my present invention, I employ power shifting mechanism, connected to and cooperating with a yielding retarder and a stop, the latter designed to be thrown into the path of a dog, which is thrown out of the path of the stop by centrifugal force, and into the path of said stop by a spring or the like. The object of these elements when stopping the sewing machine, is to throw the power, and in so doing tighten a flexible retarder on a tight pulley, to gradually retard the motion, and at the same time position a stop so that when the speed of the tight pulley has fallen below a predetermined speed, the dog is actuated to encounter the stop to positively and finally bring the sewing mechanism to a standstill. The mechanism is timed and proportioned, that the retarder will effectually reduce the speed of the tight pulley, and the dog engage the stop at a time when the needle is elevated, and withdrawn from the material.

My invention is primarily adapted for use in connection with a "count stitch sewing machine" but is also applicable to sewing machines of other types.

Other objects and advantages will be hereinafter referred to and particularly pointed out in the claims.

In the drawings, Figure 1 is a side eleva-

tion of my invention, illustrating the stopping mechanism thrown to permit the sewing mechanism to operate. Fig. 2 is a partial side elevation of a sewing machine, with a part of the stopping mechanism in section, and thrown to stop the sewing mechanism. Fig. 3 is a plan view of the stopping mechanism, positioned, parts being in the position shown in Fig. 1. Fig. 4 is an end elevation with the fast and loose pulleys removed. Fig. 5 is an end elevation. Fig. 6 is a face view of the fast pulley, illustrating the dog. Fig. 7 is a detail perspective view of the stop lug and its collar. Fig. 8 is a view of a modification.

The numeral 1 indicates a sewing machine, 2 the power shaft, and 3 a bearing for the same. Mounted fast on the shaft 2 by a screw 4^a is a pulley 4, having a hub 5 coincident with bearing 3; and a sleeve 6. The circumference of pulley 4, is grooved to form a friction pulley 7, and adjacent the groove is a second but much smaller groove 8, to receive the power belt. In a recess 9, of pulley 4, is a dog 10, pivoted at 11, having an engaging point 12, and a spring 13, which forces the point toward the hub 5.

A loose pulley 15 is mounted on the sleeve 6, and it is provided with a shallow groove 16, adjacent groove 8, of the fast pulley. A sleeve 17 on shaft 2, bears against the pulleys 15, to retain it in proper position, and a nut 18 holds the sleeve in place.

A collar 19 having flanges 19^a to form a groove, is mounted to slide on the bearing 3, and hub 5, and extending from the collar is a stop lug 20, which cooperates with the dog 9, to bring the sewing mechanism to a final stop. An arm 21 depends from the collar, and is formed with an opening 22 through which a yielding belt passes.

24 indicates a belt shifter, provided with two arms 20^a and 21^a, connected by a bolt 25, for convenience in assembling and dismantling the parts. Arm 20^a is enlarged to form a substantial flange 26, and it has an opening 27, through which the collar 19 passes, the head being narrower than the groove to permit the belt shifter to be moved a greater distance than the stop lug 20. Arm 21^a is formed with an opening 28, and is mounted to slide laterally on the sleeve 17, the outer end of said arm having an opening through which the power belt passes. The belt shifter is free to be circumferentially turned to accom-

moderate any angular position of the power belt 29, without displacing or rearranging any of the other parts.

In standard 30, is mounted a shaft 31, carrying a tilting frame 32, having a projection 33, formed with openings to receive the terminals of a yielding belt 34 which fits in the groove 7 of the fast pulley. One end of the belt is fastened in its opening by a set screw 35, then it is passed around the friction pulley, and through the opening 22 of the arm 21, and is finally secured in its opening by a set screw 36. The upper end 37 of the frame 32 has a headed projection 38, between which and said end 37, the flange 26 is loosely held by means of which movement of the frame 32, is imparted to the belt shifter. A latch arm 39 extends from the frame 32, and is caught by a latch 40, pivoted at 41, and controlled by the automatic throw out mechanism 42. A spring 43 is attached at one end to the latch arm 39, and at its opposite end to a projection on the sewing machine, an adjustable stop 44 limiting the upward movement of said lever. A bell crank lever is secured to shaft 31, the short arm 45 of which is adapted to strike an extension 46 of the frame 32, while to the long arm 45^a is attached a chain or other connection 48, to start the sewing mechanism, the movement of the lever being limited by a stop 49.

To start the sewing mechanism, connection 48, is operated to draw down lever 45^a until stop 49 is reached, causing arm 45 to move the tilting frame 32 on its fulcrum 31 toward the sewing machine, until lever 39 is caught and held by catch 40. Projection 33 being on the frame, when the latter is tilted, the projection is raised and consequently the belt 34 is slackened and friction on pulley 7 is removed, and as frame 32, is loosely connected to flange 26 of the belt shifter, the latter carries belt 29 from the loose to the fast pulley, and the stop lug 20 from the path of the dog 10, as shown in Fig. 1. As the distance between the centers of the fast and loose pulleys is greater than the required movement of the stop lug 20, the flange 26 moves between the flanges of the collar 19. Hence in starting the machine, flange 26 moves the distance from the full to the dotted line position indicated at *a* in Figure 2, before collar 19 carrying stop 20 commences to move. This gives ample time for the belt to be in proper position to engage the fast pulley by the time stop lug 20 is clear of the dog 10. The belt having been transferred from the loose to the fast pulley, the sewing machine is in motion, and as the pulley 4 is revolved rapidly in the direction of arrow *b*, Fig. 6, the dog 10, is thrown outwardly and away from the normal path of the stop lug 20, by centrifugal force, against the tension of spring 13, as shown in dotted lines in Fig. 6. When the required number of stitches

have been completed, the automatic throw out mechanism 42 disengages the latch, and the spring 43, acts to return the stopping mechanism to normal position, as follows: The tilting frame 32 now being actuated by spring 43, the belt shifter is moved toward the right (Fig. 2) which shifts the belt from the fast to the loose pulley, and moves the stop lug 20 to its normal position. However, by reason of the construction of the collar 19 and flange 26, the belt is shifted just prior to the positioning of the stop. When the frame is tilted it throws projection 33 downwardly, which tightens belt 34 on friction pulley 7, and the speed of the machine is quickly reduced, to allow the spring 13 to force the dog 10 inwardly to engage stop lug 20. The stop lug having previously been positioned, the dog engages it when the spring 13 overcomes the centrifugal force of pulley 4, and the sewing mechanism is stopped. However, as the collar 19 is connected to belt 34 by arm 21, and as the said collar is free to turn, when the dog engages the stop the belt is pulled tightly around pulley 7, which insures of the final stop being made softly and without "back lashing". The stop lug and connection with the belt 34, are arranged so that when the final cushioned stop takes place the sewing mechanism is positively stopped with the needle elevated and out of the fabric.

It must be understood that the spring 13 is of the proper tension, so that it can only overcome the centrifugal force when the speed of the fast pulley is greatly reduced, hence when the stop is engaged, the belt 34 will serve as a final cushion.

The yielding belt to retard the movement of the fast pulley is of the utmost importance. It is noiseless; it is quickly adjusted; and it is effective as a binding agent. The centrifugal force overcoming the tension of the dog spring, to remove the dog from the path of the stop lug, is also important. These two vital features with their necessary connections in an organized stopping mechanism, one dependent on the other and operating in conjunction with each other produce a positive and convenient means of stopping the mechanism to insure of the needle being left in the proper position for the next operation.

The location of the yielding belt, and its connection with the tilting frame and the arm of the stop lug, serves to not only preliminarily retard the movement of the fast pulley, but also serves to finally stop the movement of said pulley, should the contact with the stop lug take place a moment before the predetermined time.

In practical use, I have successfully stopped the stitching mechanism, with a speed as high as three thousand revolutions, and as low as fifteen revolutions per minute, the needle in each instance being elevated above the material at the proper time. This I

attribute to the peculiar arrangement of parts previously described.

The stopping mechanism may be manually operated during the stitching operation, by disengaging the latch as will be readily understood.

My invention may be arranged so as to be used as a safety device. As illustrated in Fig. 8, 50 indicates a fast pulley, 51 a power belt, 52 a dog on the pulley and 53 a stop adapted to be manually operated. In operation this arrangement of parts is such that when starting a machine, the stop is either removed, and then replaced, or the dog is lifted over said stop until the centrifugal force is sufficient to withhold the dog from the path of the stop. Should a break occur, the dog will engage the stop immediately the revolution of the pulley falls below a predetermined point. If a brake be applied to slow down the speed of the pulley, the stopping operation is just as effective.

What I claim as new is:

1. In combination, a machine having a power shaft and a fast dog carrying element, a dog movably mounted on the dog carrying element and revolved thereby, and a stop, said dog being moved out of line with the stop by centrifugal force when the dog carrying element exceeds a predetermined speed, and moved into line with the stop by the slowing of the speed of the pulley, to stop the machine in a determinate position.

2. In combination, mechanism having a power shaft and a dog carrying element, a stop movable toward and from the plane of travel of a removable dog; traveling toward the stop, said dog engaging the stop when the speed of the power shaft falls below a predetermined speed, to stop the mechanism at a determinate position.

3. In combination, mechanism having a power shaft and a dog carrying element, a movable cushioned stop, and a movable dog which engages the stop when the power shaft revolves below a predetermined speed to stop the mechanism at a determinate point.

4. In combination, mechanism having a power shaft and a dog carrying element, a movable stop, a movable dog which engages the stop, and a spring forcing the dog toward the stop, the dog being thrown from the path of the stop by centrifugal force and thrown toward the stop by the spring when the speed of the pulley falls below a predetermined speed, to stop the mechanism at a determinate point.

5. In combination, mechanism having a power shaft and fast and loose pulleys, a stop, power transmitting means, a movable dog, and a shifter, the shifter transferring the power transmitting means to the fast pulley and moving the stop, the dog being thrown by centrifugal force from the normal

path of the stop, the reverse movement of the shifter transferring the power transmitting means to the loose pulley and returning the stop to normal position, the reduction of speed of the power shaft causing the dog to assume normal position to contact with the stop to hold the securing mechanism in a predetermined position.

6. In combination, mechanism having a power shaft and fast and loose pulleys, power transmitting means, a cushioned stop, a movable dog, and a shifter, the shifter transferring the power transmitting means to the fast pulley and moving the cushioned stop, the dog being thrown by centrifugal force from the normal path of the cushioned stop, the reverse movement of the shifter transferring the power transmitting means to the loose pulley and returning the cushioned stop to normal position, the reduction of speed of the power shaft causing the dog to assume normal position to contact with the cushioned stop to hold the mechanism in a predetermined position.

7. In combination, mechanism having a power shaft and fast and loose pulleys, power transmitting means, a stop, a movable dog, a spring normally pressing the dog in the path of the stop, a shifter, the shifter transferring the power transmitting means to the fast pulley and moving the stop, the dog being thrown by centrifugal force from the normal path of the stop the reverse movement of the shifter transferring the power transmitting means to the loose pulley and returning the stop to normal position, the reduction of speed of the power shaft causing the dog to assume normal position under the influence of its spring to contact with the stop to hold the mechanism in a predetermined position.

8. In combination, a machine having a power shaft and a fast and loose pulley, power transmitting means, a shifter, a stop movable with the shifter, a dog on the fast pulley, a retarder, means connecting the retarder and the stop, the movement of the shifter transferring the power transmitting means from the fast to the loose pulley which actuates the retarder to reduce the speed of said fast pulley, at which time the dog moves to engage the stop to stop the machine at a predetermined point.

9. In combination, a machine having a power shaft and a fast pulley, a movably mounted dog, a stop, a retarder, and means actuating the retarder to reduce the speed of the pulley to cause the dog to move and engage the stop to stop the machine at a predetermined point.

10. In combination, a machine having a power shaft and a fast pulley, a movably mounted dog, a stop, a yielding retarder, and means actuating the retarder to reduce the speed of the pulley to cause the dog to move

and engage the stop to stop the machine at a predetermined point.

11. In combination, a machine having a power shaft and a fast pulley, a dog a stop, a yielding retarder acting directly on the fast pulley, means actuating the yielding retarder to reduce the speed of the pulley to cause the dog to move and engage the stop to stop the machine at a predetermined point.

12. In combination, a machine having a power shaft and a fast pulley, a dog a stop, a yielding retarder, a connection between the retarder and the stop, means actuating the yielding retarder to reduce the speed of the pulley to cause the dog to move and engage the stop, said engagement also acting to tighten the retarder.

13. In combination, a machine having a power shaft and a fast and loose pulley, a dog power transmitting means, a stop, a retarder, a shifter and means for actuating the shifter whereby the stop is moved, the power transmitting means shifted to the loose pulley, and the retarder actuated to reduce the speed of the fast pulley, at which time the dog engages the stop.

14. In combination, a machine having a fast and a loose pulley, power transmitting means, a stop, a movable dog, a retarder connected with the stop, and a shifter connected with the retarder, the movement of the shifter transferring the power transmitting means from the fast to the loose pulley which also actuates the retarder, and moves the stop, the reduction of the speed of the fast pulley causing the dog to engage the stop and further actuate the retarder.

15. In combination, a machine having a fast and a loose pulley, power transmitting means, a dog, a cushioned movable stop, a retarder, a shifter, and means for actuating the shifter whereby the stop is moved, the power shifted to the loose pulley, and the retarder actuated to reduce the speed of the fast pulley, at which time the dog engages the cushioned stop, the latter engagement also serving to retard the movement of the fast pulley before the final stop takes place.

16. In combination, a machine having a power shaft and a fast pulley, a stop, a pivotally mounted dog on the pulley, means normally forcing the dog inwardly, the dog being thrown outwardly by centrifugal force, a retarder, and means simultaneously actuating the stop and the retarder to reduce the speed of the pulley, at which time the spring overcomes the centrifugal force and causes the dog to move and engage the stop.

17. In combination, a machine having a power shaft and a fast pulley, a stop, a revolvable movable dog, a retarder, and means automatically operating the retarder to reduce the speed of the pulley at which time the dog moves and in its revolution it engages the stop.

18. In combination, a machine having a power shaft and a fast and loose pulley, power transmitting means, a movable dog, a stop, a retarder, a shifter, and means for moving the shifter, the movement of said shifter shifting the power transmitting means to the loose pulley, tightening the retarder on the pulley, bringing the stop into position to cooperate with the dog, said dog engaging the stop when the speed of the pulley has been decreased.

19. In combination, a machine having a power shaft and fast pulley, power transmitting means, a yielding retarder comprising a belt, means for tightening the belt to retard the movement of the pulley, and a final stop.

20. In combination, a machine having a power shaft and a fast pulley, power transmitting means, a yielding retarding device comprising a belt, and means for tightening the belt to retard the movement of the pulley, and a cushioned final stop.

21. In combination, a machine having a power shaft and a fast pulley, power transmitting means, a yielding retarding device passing over the pulley, the ends of said retarder being secured to a tilting lever, a tilting lever, a stop controlled by the tilting lever, and a movable dog, the tilting lever actuating the retarder and reducing the speed of the pulley to permit the dog to move and engage the stop.

22. In combination, mechanism having a power shaft and fast and loose pulleys, a pivoted dog with a means to normally force it inwardly, a slidable stop mounted to be moved in the direction of the power shaft, a retarder connected with the stop and acting on the fast pulley, and automatic means for actuating the retarder and sliding the stop in the path of the dog, said dog engaging the stop and cushioning the blow and bringing the mechanisms to a stop when the speed of the fast pulley falls below a predetermined point.

23. In combination, a machine having a power shaft, fast and loose pulleys thereon, a belt and a stopping mechanism, said stopping mechanism comprising a belt shifter, a cushioned stop controlled by the belt shifter, a spring actuated stopping dog normally pressed toward the path of the stop, means for actuating the shifter, the dog being thrown from the path of the stop by centrifugal force when the belt is on the fast pulley, and forced into the path of the stop by its spring, to stop the machine when the belt is shifted to the loose pulley, and the speed of the fast pulley is reduced.

24. In combination, mechanism having a power shaft and fast and loose pulleys, a belt, a movable dog carried by the fast pulley, a movable stop, a belt shifter loosely mounted to be positioned at any angle to receive the belt, the belt shifter controlling the

movement of the stop, and means for operating the shifter to move the belt from the fast to the loose pulley, and move the stop in the path to be struck by the dog when the fast pulley reaches a predetermined speed to stop the mechanism.

25. In combination, a machine having a power shaft and a fast and loose pulley, a stop, a movably mounted dog, a retarder, means actuating the retarder to reduce the speed of the pulley to cause the dog to move and engage the stop to stop the machine at a predetermined point, a belt cooperating with the fast and loose pulley, and a belt shifter mounted to turn concentric with the power shaft.

26. In combination, a machine having a power shaft and a fast and loose pulley, a dog, a retarder provided with a stop, a belt shifter carried by the retarder and having circular and lateral movement thereon, a belt carried by the belt shifter to transfer the belt from the fast to loose pulley and vice versa, and to move the retarder to place the stop in operative position relative to the dog, and means for operating the belt shifter.

27. In combination, a machine having a power shaft and fast and loose pulleys, a retarder having a stop and formed with a groove, a pivoted dog thrown away from the stop by centrifugal force when the shaft is revolved, means to return the dog to normal position, a belt shifter fitting in the groove and having circular and lateral movement therein, a belt, means for operating the belt shifter to transfer the belt from the fast to the loose pulley and vice versa, and the retarder.

28. In combination, a machine having a power shaft and fast and loose pulleys, a pivoted dog mounted on the fast pulley, a stop cooperating with the pivoted dog, a retarding device formed with a groove, a belt shifter engaging the groove and having lateral movement therein, a belt shifter, and means to operate the belt shifter to move the belt in advance of the movement of the stop.

29. In combination, a machine having a power shaft and fast and loose pulleys, a pivoted dog, a retarding device provided with a stop and a groove, a belt shifter mounted in the groove and carrying a belt, a lever engaging the belt shifter to transfer the belt from one pulley to the other, and also move the stop with relation to the dog, the shifting of the belt being started prior to the movement of the dog, and the retarder being operated before the movement of the belt is completed when stopping the machine.

30. In combination, a machine having a shaft, carrying a disk, a retarding device, which includes a yielding element contacting with the disk, a final stop, power transmitting means for operating the shaft and releasing the retarding device, and shifting

the power transmitting means, and automatic means for applying the retarder and the final stop, to stop the machine at a predetermined point.

31. In combination, a machine having a power shaft and fast and loose pulleys, a pivoted dog, a stop cooperating therewith, manual means for removing the stop from the path of the dog, said dog being thrown from its normal position by movement of the shaft, a retarder, automatic means for throwing the stop to its normal position and applying the retarder, the reduction of the speed of the machine permitting the automatic means to return the dog to its normal position to contact with the stop, to stop the machine at a predetermined point.

32. In combination, a machine having a power shaft and fast and loose pulleys, a pivoted dog, a stop cooperating therewith, manual means for removing the stop from the path of the dog, said dog being thrown from its normal position by movement of the machine, a retarder having a yielding movement, automatic means for throwing the stop to its normal position and operating the retarder, the reduction of the machine permitting the dog to assume normal position to contact with the stop to stop the machine at a predetermined point.

33. In combination, a machine having a power shaft, a disk on the shaft, a positive stop comprising a pivoted dog and an abutment therefor, a yielding retarder passing over the disk and having its ends fixed, and means operating the retarder in advance of the engagement of the dog with its abutment, said means also serving to position the abutment in a plane to be encountered by the dog.

34. In combination, a machine having a power shaft and fast pulley, a pivoted dog carried by the fast pulley which is thrown outwardly by centrifugal force, a spring for returning the dog to normal position, a stop, a yielding retarder on the fast pulley, and means for operating the retarder, the movement of said means also serving to position the stop relative to the dog for the latter to engage the former to stop the machine at a predetermined point.

35. In combination, a machine having a power shaft and fast pulley, a final stop which includes a dog and an abutment, a yielding retarder passing around the fast pulley and having its ends fastened, means for adjusting the tension of the retarder on the pulley, and means for operating the retarder, also the dog to finally stop the machine at a determinate point.

36. In combination, a machine having a power shaft, a retarder, a final stop, and means for operating the retarder, the final stop being operated by the decreased speed of the power shaft.

37. In combination, a machine having a power shaft and fast pulley, a yielding retarder operating on the fast pulley, a final stop, and means for operating the retarder, the final stop being operated by the decreased speed of the fast pulley, to stop the machine at a predetermined point.

38. In combination, a machine having a power shaft and disk fast thereon, a yielding retarder operating on the disk, a final stop, means for releasing the retarder, and releasing the final stop to start the mechanism, and means for reversing the movement of the retarding operating means, and returning the final stop to normal position, to stop the machine at a determinate point.

39. In a stop motion device, the combination with a power shaft, fast and loose pulleys on said shaft, a positive stopping device between the shaft and fast pulley, said stopping device including a movably mounted dog normally in contact with a stop, manual means for withdrawing said stop from locking position with the dog simultaneously with the shifting of the belt from the loose to the fast pulley when the shaft is revolved beyond a determinate speed, and automatic means for reducing the speed of the shaft to cause the movable dog to contact with the stop and stop the shaft in a determinate position.

40. In a stop motion device, the combination with a power shaft, fast and loose pulleys on said shaft, a belt shifter, a stopping device including a movable dog mounted on the fast pulley and a stop with which the movable dog normally engages, means for operating the stop belt shifter to transfer the belt from the loose to the fast pulley to revolve the shaft and thereby throw the movable element into operable position by centrifugal force, and automatic means for moving the belt shifter to throw the belt from the fast to the loose pulley and reduce the speed of the shaft to permit the movable dog to engage the stop and stop the shaft in a determinate position.

41. In a stop-motion device, the combination with a rotary shaft having fast and loose pulleys thereon, of a belt-shifter, holding means for retaining said belt-shifter in position so that the driving-belt will run on said fast pulley, automatic means for tripping the said holding means and for moving said belt-shifter, to transfer the driving-belt from said fast pulley to said loose pulley, a positive stopping device for said shaft, and a friction belt which is operated independently of the said positive stopping device and which is drawn against the fast pulley when the said belt-shifter is moved to transfer the said driving-belt to said loose pulley, the said friction belt being so arranged that when it is drawn against the fast pulley the move-

ment of the latter is arrested or retarded before the said positive stopping device comes into operation, so as to soften the jar or shock of the final stop.

42. In a stop-motion device, the combination with a rotary shaft having fast and loose pulleys thereon, of a belt-shifter, holding means for retaining said belt shifter in such position that the driving-belt will run on said fast pulley, automatic means for tripping said holding means and for moving said belt-shifter, to transfer the driving-belt from said fast pulley to said loose pulley, a positive stopping device for said shaft comprising a stop, a friction belt which is operated independently of the said stop and which is operated when the said belt-shifter is moved to transfer said driving-belt to said loose pulley, and adjusting means for varying the stress of said belt to cause more or less arresting or retarding action to be exerted before the said positive stopping device comes into operation; whereby the jar or shock of the final stop may be softened to any desired degree.

43. A stop-motion device comprising a driven shaft, a positive stopping device therefor including a stop and an element cooperating therewith, an independently-mounted and independently-operated arresting or retarding device for said shaft, and common means for tripping said arresting or retarding and positive stopping devices into action to effect their successive operation upon the driven shaft.

44. A stop-motion device comprising a driven shaft, a positive stopping device therefor, an independently-mounted and independently-operated arresting or retarding device for said shaft, common means for tripping said arresting or retarding and positive stopping devices into action to effect their successive operation upon the driven shaft, and a cushioning device for the said positive stopping device.

45. In a stop motion device, the combination with a revolving power shaft having fast and loose pulleys thereon, of a belt shifter, holding means for retaining said belt shifter in position so that the driving belt will run on said fast pulley, automatic means for tripping the said holding means and for moving said belt shifter to transfer the driving belt from said fast to said loose pulley, a stopping device for said shaft, including a pivoted element thrown outwardly by centrifugal force when the revolving power shaft is set into motion and a retarding element is released, and a retarding element, the retarding element reducing the speed of the fast pulley when said belt shifter is moved to transfer the belt from the tight to the loose pulley to allow the pivoted element to assume normal position to permit the

stopping of the revolving power shaft at a determinate point.

46. In a stop motion device, the combination with a power shaft having fast and loose pulleys thereon, a belt shifter, a positive stopping device cooperating with the fast pulley and including a stop and a movably mounted dog normally in contact with said stop, means for manually withdrawing the stop from contact with the dog and shifting the belt from the loose to the fast pulley to revolve said fast pulley and centrifugally throwing the dog out of the path of movement of the stop, and means for reducing the speed of the power shaft to cause the dog to assume normal position and contact with the stop to stop the shaft in a determinate position.

47. In a stop motion device, the combination with a power shaft having fast and loose pulleys mounted thereon, a belt shifter, a stopping device including an element which is thrown outwardly by centrifugal force, and a movable element cooperating with the centrifugally thrown element, means connecting the movable element and the belt shifter, means for operating the movable element and the belt shifter to transfer the belt, and automatic means for operating the movable element and the belt shifter to reduce the speed of the power shaft to allow the centrifugally operated element to assume normal position and contact with the movable element to stop the shaft in a determinate position.

48. In a stop motion device, the combination with a power shaft, power shifting means, a centrifugally operated stopping element, said stopping element being thrown outwardly when power is applied to the shaft, a second element cooperating with the centrifugally operated stopping element, means for withdrawing the second mentioned element from contact with the centrifugally operated stopping element, automatic means for releasing the second element to retard the movement of the power shaft, and adjusting means cooperating with the second stopping element to cause one or more revolutions of the power shaft after the second element is automatically released and before the centrifugally operated stopping element finally stops the movement of said shaft.

49. In a stop motion device, the combination with a power shaft, having fast and loose pulleys thereon, a belt shifter, a centrifugally operated element, a stop with which the centrifugally operated element cooperates, means for manually moving the belt shifter to transfer the belt to the fast pulley and simultaneously withdrawing the stop from normal position, automatic means for returning the belt shifter and the stop to normal position to reduce the speed of the

power shaft, the centrifugally operated element while thrown outwardly being out of contact with the stop until predetermined speed and position of the power shaft is reached.

50. In a stop motion device, the combination with a power shaft, fast and loose pulleys mounted thereon, a belt shifter, two stopping devices, one of which is pivotally mounted and is centrifugally thrown from normal position outwardly to permit the power shaft to revolve when the power belt is applied to the fast pulley, the other said stopping device mounted to be moved independently of the pivotally mounted stopping device, means for moving the second mentioned stopping device and the belt shifter to move said belt shifter in position so that the driving belt will run on the fast pulley, said movement also releasing the second mentioned stopping device, and automatic means for operating the second mentioned stopping device to reduce the speed of the revolving power shaft and allow the pivotally mounted stopping device to assume normal or locked position to permit stopping the revolving shaft in a determinate position.

51. In a stop motion device, the combination with a power driven shaft, a driven element fastened to said shaft, power shifting means, a centrifugally controlled element carried by the driven element, a stop cooperating with the centrifugally controlled element, said centrifugally controlled element positioning itself with relation to the stop when the power shifting means is operated and the speed of the power shaft is reduced, the cooperation of said stop and said centrifugally operated element causing predetermined stopping and positioning of said shaft.

52. In a stop motion device, the combination with a power driven shaft, a centrifugally controlled element, means fastened on the shaft to support the centrifugally controlled element, a non-revolving device cooperating with the centrifugally controlled element to stop the revolving shaft when a predetermined speed and position of said shaft is reached.

53. In a stop motion device, the combination with a power driven shaft, a centrifugally controlled element, means fastened on the shaft to support the centrifugally controlled element, power shifting means, and a locking device, the centrifugally controlled device preventing the final locking of the shaft by the locking device until a predetermined speed is reached after the shifting means is moved.

54. In a stop motion device, the combination with a power driven shaft, a centrifugally controlled element, means fastened to the shaft to support the centrifugally operated element, a locking device cooperating

with the centrifugally operating element, the
centrifugally operated element preventing
the final locking until a predetermined speed
and position of the shaft is reached, and ad-
5 justable means to reduce the speed of the
shaft to alter the time of the operating of the
locking device after power is shifted.

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

HENRY C. MILLER.

Witnesses:

WM. F. PALMER,
ALONZO KNAPPEN.