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Patented Apr. 22, 1902.

F. WILCOMB.

STOP MOTION FOR KNITTING MACHINES.

(Application filed Apr. 24, 1901.)

(No Model.)

2 Sheets—Sheet 1.

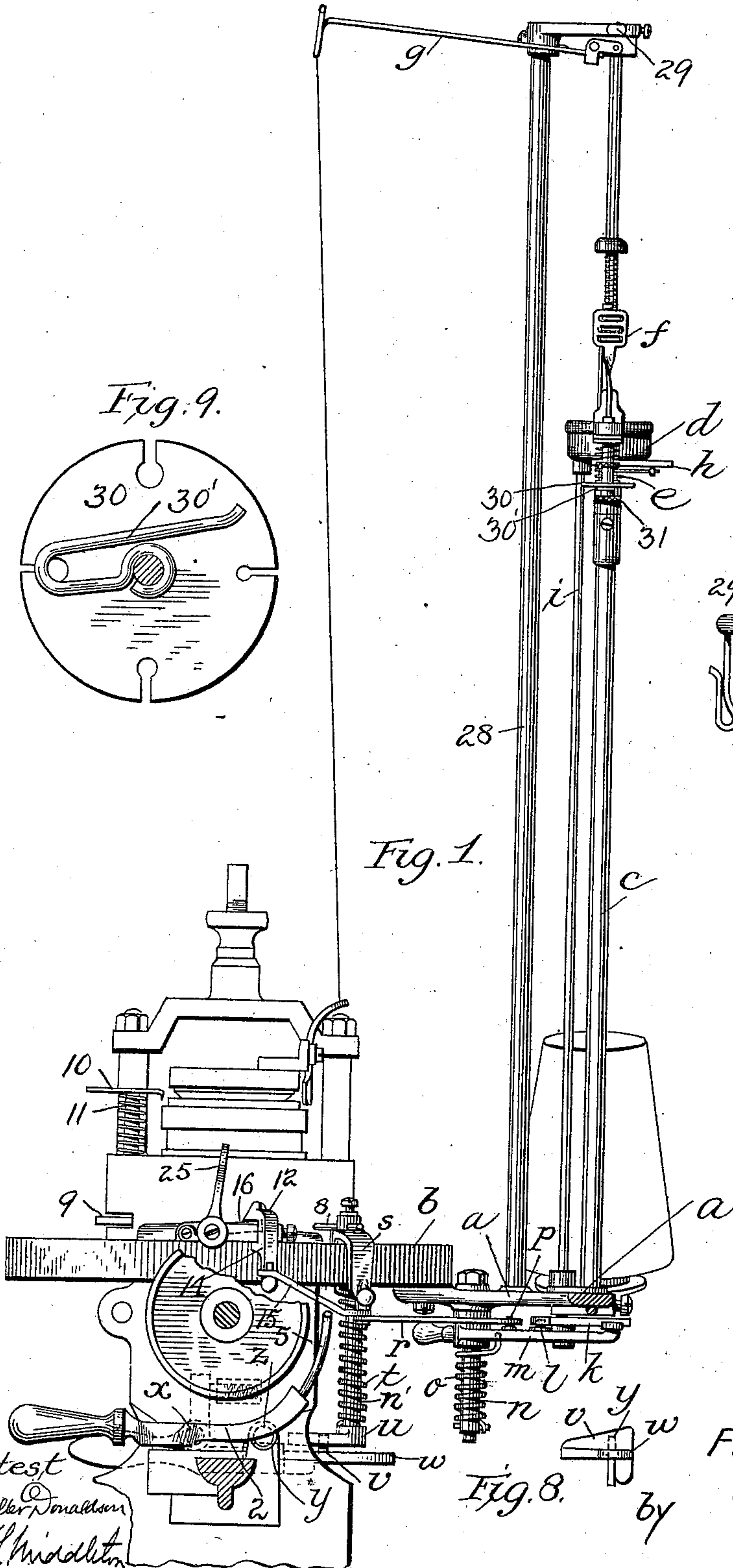
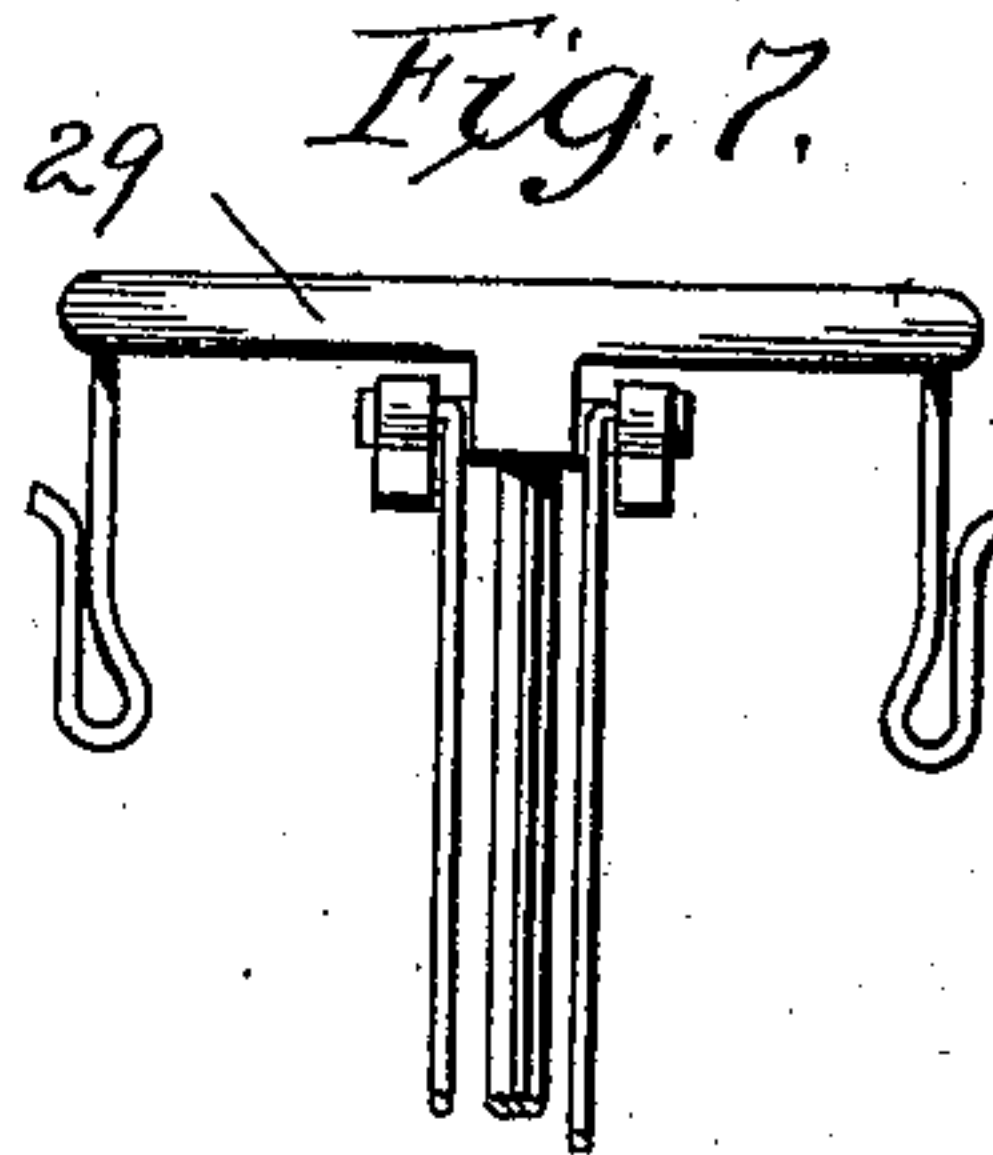
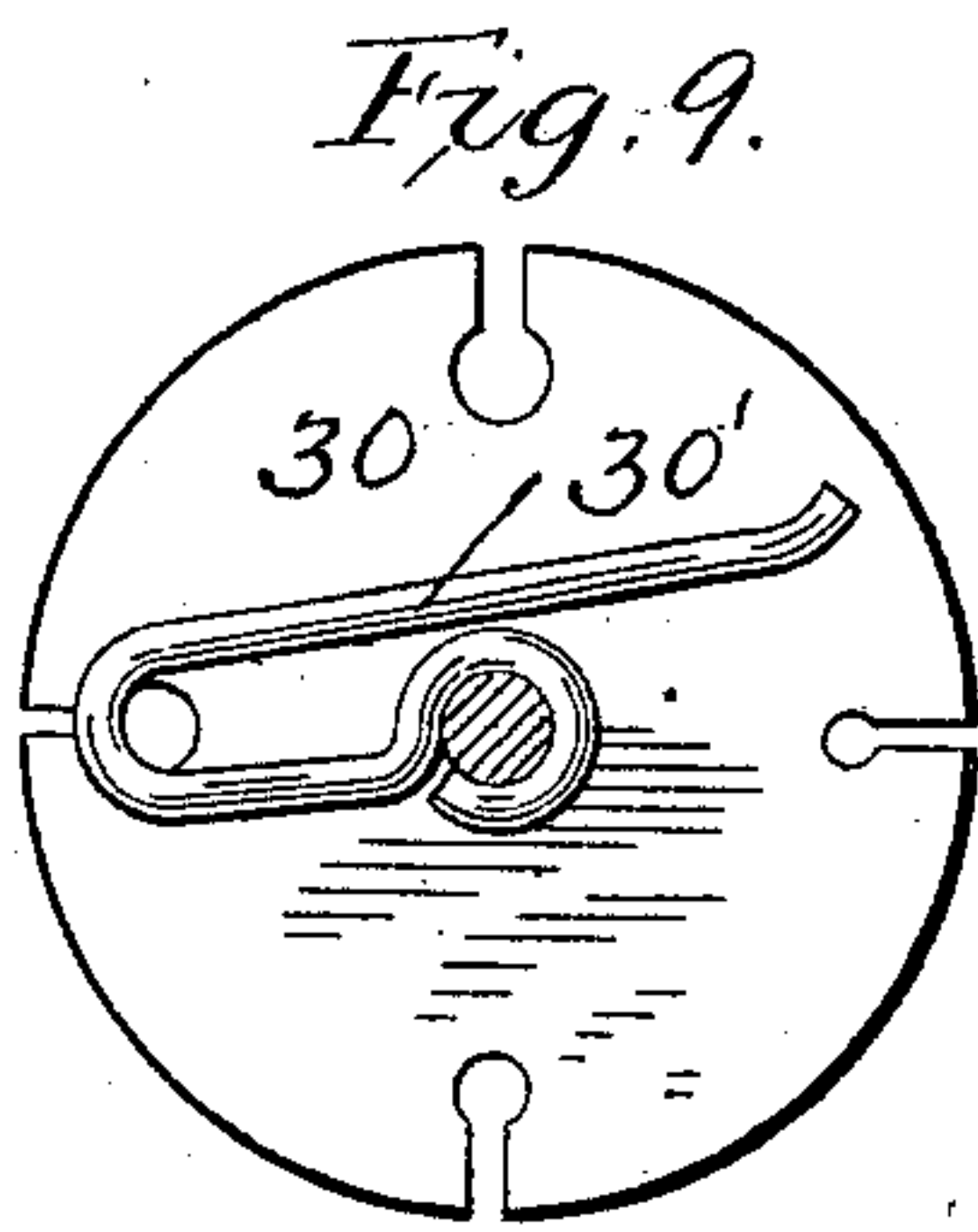


Fig. 8.

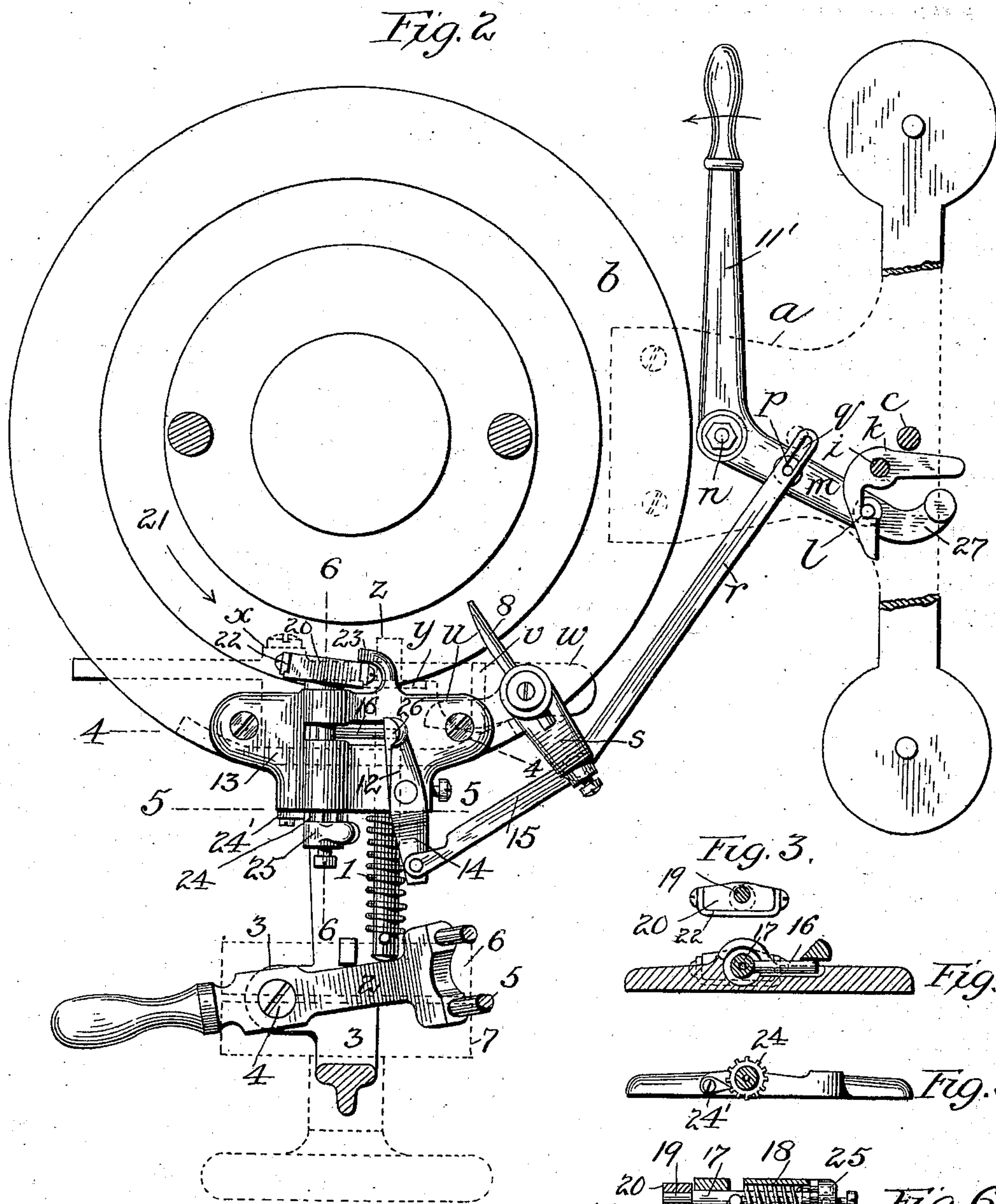
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 698,090, dated April 22, 1902.

Application filed April 24, 1901. Serial No. 57,302. (No model.)

To all whom it may concern:

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

My invention relates to stop-motions for knitting-machines, and particularly to that form in which the bobbins are fixed in relation to the rotating parts of the machine, though it will be understood that some features of my invention are applicable to other forms of machines in which the bobbins revolve.

My improvements include means whereby the machine will be stopped when the thread fails or becomes taut or when bunches or knots occur at the needles; and the invention consists, further, in friction means for arresting the machine quickly when the power is thrown off and in means whereby the various parts may be reset for another operation.

In the drawings, Figure 1 is a side view of so much of a knitting-head as is necessary to illustrate the application of my invention, which is shown in connection therewith. Fig. 2 is a plan view with parts omitted and parts in section. Fig. 3 is a view of the brake-shoe. Fig. 4 is a sectional view through the friction brake device on line 4 4 of Fig. 2. Fig. 5 is a view of the same device on line 5 5 of Fig. 2. Fig. 6 is a sectional view on line 6 6 of Fig. 2. Fig. 7 is a detail view of the means for supporting the sweeps. Fig. 8 is a detail view of the let-off connections. Fig. 9 is a view of a thread-gage.

The bobbin-stand *a* is fixed to the base-ring *b* of the knitting-head by screws, as shown, and centrally from this stand a standard *c* extends upwardly, and at an intermediate point a stop-motion head *d* is supported. This head is similar to that shown by me in an application for Letters Patent of the United States, filed November 2, 1900, Serial No. 35,272, the tripping-spring *e* of said stop-motion head being released whenever the yarn fails or becomes taut, the former action allowing a feeler-finger *f* to drop and cause the spring to be released through suitable connections and the latter action causing the downward movement of the sweep *g*, which controls severing

devices for the yarn, and these in turn control the release of the tripping or power spring *e*. This mechanism forms no part of my present invention and being fully described in the application referred to needs no particular description herein.

The tripping-spring is arranged to operate an arm *h*, connected to a rock-shaft *i*, which is journaled near its lower part in the bobbin-stand and has secured to its end below the stand a trigger *k*. This trigger engages a pin *l* on a lever *m*, which is pivoted loosely on a stud *n*, fixed to the bobbin-stand and depending therefrom. A spring *o* is held to the stud at its lower end and is connected to the lever *m* at its upper end, thus applying power to operate the lever in the direction opposite to that of the arrow, Fig. 2, when released by the trigger. A pin *p* on the lever engages a slot *q* in a link *r*, which is connected with an arm *s*, carried by a rock-shaft, which extends vertically and is journaled at its upper end in the base-ring *b* of the knitting-head. This shaft is under tension of a spring *t*, which tends to hold the rock-shaft in normal position and with the wall of the slot *q* bearing against the pin *p*, as shown in Fig. 2. An arm *u*, fixed to the lower end of the rock-shaft, extends into line with a cam-rib *v* on a tripper-lever *w*, which is pivoted to the frame of the machine at *x* and carries a latch-piece *y*, adapted to engage a groove in the shipper-rod *z*, which is adapted to slide longitudinally through suitable bearings on the frame and is under tension of a spring *1*, tending to force the rod outwardly. The rod at its outer end bears upon the shipper-lever 2, which is pivoted to the supporting-bracket 3 at 4 and carries the shipper-fork 5.

The fast and loose pulleys of the driving mechanism are indicated at 6 7, Fig. 2. The parts are set as shown in Fig. 2 to drive the machine. When now the yarn fails or becomes taut and the tripping mechanism of the stop-motion head *d* is operated, the spring *e* will through the lever *h* rotate the rock-shaft *i*, and this will withdraw the trigger *k* and release the lever *m*, which under the strong tension of the spring *o* will push on the link *r* and arm *s* and turn the rock-shaft *n'* against the weaker power of its spring *t*, and thus the arm *u* of the rock-shaft will en-

gage the inclined rib *v* of the tripper-lever, depressing this lever and withdrawing the latch-piece *y* out of engagement with the groove of the sliding shipper-rod *z*, which now under tension of its spring will shift the shipper-lever, and thus shift the belt onto the loose pulley and stop the machine.

For stopping the machine where bunches or knots occur at the needles a finger 8 is provided, which extends through the boss or hub of the arm *s* and through the rock-shaft *n'*, holding these parts together. The inner end of the finger lies in the path of an arm 9, carried by the knitting-head and thrown out and in to engage or miss the finger by an arm 10 on the rock-shaft 11, journaled in the head, said arm reaching in and having fingers adjacent to the needles, so that when a bunch or knot occurs at the needles the arm and rock-shaft will be operated and the lower arm 9 will be moved out to contact with the finger 8 in the continued rotation of the head, thus operating the rock-shaft and the shipper connections described. For resetting the parts a handle 11' is provided connected to the power-lever *m*, and by moving this in the direction of the arrow in Fig. 2 the arm 27 of the lever will move the trigger and through the rock-shaft *i* will reset the tripping-spring of the stop-motion head, and by the same action the pin *l* will be caught and held by the trigger *k*. The arm *s* and rock-shaft being now relieved from pressure from the power-lever *m*, the weaker spring *t* will return the rock-shaft and arm *u* to normal position. Of course when the rock-shaft is operated by the finger 8 alone the power-lever *m* remaining in the position shown, the arm *s*, rock-shaft, and arm *u* will be reset at once by the spring *t*, the slotted connection of the link *r* allowing this to be done and allowing the operation of the said parts independently of the power-lever and stop-motion head *d*.

In order to overcome the momentum of the machine and bring the same quickly to rest after either stop-motion connection has been operated, I provide a friction-brake connected to the arm *s* to be operated thereby. This comprises a catch-lever 12, pivoted to a base-plate 13, which is screwed to the fixed base-flange of the machine. The depending arm 14 of this catch-lever is connected by the link 15 with the arm *s* or link *r*, and at its inner end it is adapted to overlies a latch-pin 16, carried by a shaft 17, journaled in the base-plate. The shaft is under tension of a spring 18, tending to turn it, and it has an eccentrically-arranged pin 19 at its end, upon which is loosely pivoted the brake-shoe 20. When the latch-pin is engaged by the catch-lever, as shown in Figs. 2, 4, and 6, the brake-shoe is raised out of contact with the flange 21 of the rotary head and the head is free to turn, as indicated by the arrow in Fig. 2. When, however, the catch-lever 12 is withdrawn from over the latch-pin, the spring 18 will rotate the shaft 17 and the eccentric-pin 19 will

force the brake-shoe down hard upon the rotating flange, and thus stop the same quickly, and it will be seen that this action will take place when either one of the stop-motion connections is operated, the link 15 being operated from the arm *s* in any event.

The brake-shoe consists of a metal block having a leather wearing-piece 22 secured thereto. The shoe is held on the eccentric-pin by a projection 23, extending from the base-plate. The spring 18 may be adjusted by a ratchet-wheel 24, to which one end of it is connected, said ratchet-wheel being loose on the shaft, and held in any adjusted position by a detent 24', pivoted to the base-piece. The other end of the spring is connected to the shaft. A handle 25 is secured to the shaft, and by this the shaft 17 may be turned against the tension of its spring to reset the latch-pin into engagement with the catch-lever 14, for which purpose the catch-lever is provided with an inclined catch 26, which will allow the catch-lever to yield when the latch-pin is forced down upon it, the catch springing automatically over the latch-pin when the same gets below it. This resetting of the friction device can take place after the stop-motion connections have been reset, as the slotted connection at *q* will allow the catch-lever 12 to yield as the latch is forced down. A post 28 extends up from the base of the stop-motion parallel with the standard *c*, and at its upper end it supports the block or bracket 29, to which the sweeps *g* are pivoted.

The thread-gages consist of disks 30, having a series of openings therein of different sizes, and a wire guard or finger 30', which extends over the lower surface of the disk, with its bent end adjacent to the opening through the disk and its free end extending away from said opening, so that in threading the yarn must be introduced to said guard a considerable distance away from the guide-opening, and there is no liability of the yarn assuming such a position as would cause it to fall out of the gage. The disk may be turned to bring any one of the openings into line with the thread by loosening the set-screw 31, the guard remaining fixed. These gages or knot-catchers for the thread are for the purpose well understood in the art—*i. e.*, that of preventing bunches, snarls, knots, &c., passing to the needles.

It will be seen that the power member or lever *m* is adapted to have a certain excess of motion on its resetting stroke, so that the trigger will be reset and the catch end thereof will get in rear of the pin *l* before the said power member has completed its full stroke.

I claim as my invention—

1. In combination, the bobbin-stand adapted to be fixed to the machine comprising the standard and post extending up from the base of said stand, the stop-motion head supported by the standard, a sweep, the block for the sweep supported on the said standard and post, the lever and trigger below the

base-plate, connections from the lever to the machine and means for operating the trigger from the stop-motion head, said means consisting of the rock-shaft extending down through the base-plate of the stand, substantially as described.

2. In combination, a bobbin-stand comprising a base-plate and a standard, said base-plate having means for supporting the bobbins, a stop-motion head supported on the standard, power-spring and trip mechanism carried by the base-plate and connections thereto from the stop-motion head, the said base-plate being adapted to be attached to the knitting-machine, substantially as described.

3. In combination, a lever, a spring for applying power thereto, shipper devices, connections from said lever to the shipper devices, a trigger for holding the lever, said trigger being arranged to be reset by the return movement of the lever after operating, and stop-motion connections leading to the trigger and arranged to be reset thereby, substantially as described.

4. In combination, a power-spring, a hand-lever connected therewith, a stop-motion head, a rotary stop-motion shaft extending from said head, a trigger attached to said rotating shaft to control the hand-lever, a part of said hand-lever being adapted to engage the trigger to reset the rotary shaft and to swing the trigger into locking connection with the hand-lever, substantially as described.

5. In combination, the stop-motion-controlling devices, the shipper devices, a hand-lever and power-spring comprised in the connection between them, a trigger for controlling the hand-lever and connected with the stop-motion-controlling devices, said trigger and stop-motion-controlling devices adapted to be reset by said hand-lever, substantially as described.

6. In combination in a stop-motion, controlling devices, connections leading therefrom comprising a lever and a trigger, shipper devices connected with the lever, said lever being arranged to give a positive resetting movement to the trigger, substantially as described.

7. In combination, stop-motion-controlling devices, a lever, a power-spring and a trigger connected with the controlling devices, said trigger having a tailpiece to be engaged by a part of the lever in resetting, substantially as described.

8. In combination, the stop-motion-controlling devices, a connection leading therefrom including the trigger having the tailpiece, the member controlled by said trigger and arranged to reset the same by engaging the tailpiece and connections leading from said member to the shipper devices, substantially as described.

9. In combination, a stop-motion head, a bobbin-stand having a standard supporting the same and having a base, a hand-operated

member, a trigger carried by the said base, connections between the trigger and stop-motion head, said trigger and connections being arranged to be reset by the operation of the hand-operated member, substantially as described.

10. In combination, the shipper devices, the rock-shaft for controlling the same, the finger on the rock-shaft to be operated when a knot or bunch occurs at the needles, a spring for holding said rock-shaft in normal position, a stronger spring, connections between the same and the rock-shaft to turn the latter against the power of its spring and stop-motion devices controlling the stronger spring, substantially as described.

11. In combination, the shipper devices, stop-motion devices for controlling the same, arranged to be operated by the rotary movement of the machine, a spring for returning said devices to normal position, a stronger spring with connecting means between the same and the said stop-motion devices, and acting against the said weaker spring to operate the shipper devices, and a second set of stop-motion devices for controlling the said stronger spring, the said connecting means having a loose portion by which the first set of stop-motion devices can be operated independently while the stronger spring is held inactive, substantially as described.

12. In combination, the shipper devices, the rock-shaft controlling the same, the finger carried by the rock-shaft and arranged to be operated when a knot or bunch occurs at the needles, the arm connected to the rock-shaft, a spring for returning the rock-shaft in normal position, a lever or arm, a stronger spring connected with said lever, a connection between the lever and the arm allowing the said arm to act independently of the lever, and stop-motion devices controlling the lever, substantially as described.

13. In combination with a knitting-machine having a rotary head with a horizontal flange, a fixed base-ring flush with the upper surface of the flange and a brake device supported on the fixed ring and arranged to engage the upper surface of the said flange, substantially as described.

14. In combination, the rotary head having a horizontal flange, the fixed ring having its upper face flush with that of the flange and a brake device comprising a base secured to said fixed ring, a brake-shoe arranged to engage a part of the rotary head and means carried by the base for operating the shoe, substantially as described.

15. In combination, in a stop-motion for knitting-machines, a brake-shoe, a rotary shaft, an eccentric-pin on the shaft to operate the shoe, a base-plate in which the shaft is journaled, a spring within said base-plate encircling the shaft for operating the same, and controlling means for the shaft, substantially as described.

16. In combination in a stop-motion for

knitting-machines a brake-shoe, a rotary shaft, an eccentric-pin to operate the shoe, a base-plate in which the shaft is journaled, a spring within said base-plate for operating the shaft, and controlling means for the shaft, and means for adjusting the tension of the spring consisting of the ratchet loose on the shaft to which the spring is attached and a detent for holding the ratchet, substantially as described.

17. In combination with the base-ring, the brake comprising a shaft, a base-plate in which the same is journaled secured to said base-ring, a latch-pin on the shaft, a catch-lever arranged to overlie the latch-pin, said lever being pivoted to the base-plate and means for controlling the lever, all of said parts overlying the base-ring, substantially as described.

18. In combination, the brake-shoe, the shaft carrying the same, the latch-pin on the shaft, the catch-lever for engaging the pin having a beveled end and connections for operating the lever, said connections including a loose part which will permit the catch-lever to yield, substantially as described.

19. In combination, the knitting-head, the brake, comprising the catch for holding it inactive, shipper devices, a rock-shaft with means operated thereby to control the shipper devices, the spring for applying tension to said rock-shaft, stop-motion devices connected to the rock-shaft and a connection between the rock-shaft and the catch-lever, said catch-lever being held in operative position by the said spring, substantially as described.

20. In combination, the shipper connections, stop-motion, connections controlling the same, a spring for returning said stop-motion connections to normal position, a brake device including a catch to hold the brake inactive and a positive connection from the catch to the stop-motion device whereby said catch will be moved automatically to position to keep the brake off when the stop-motion

devices are returned to normal position, substantially as described.

21. In combination, the shipper connections, the rock-shaft with means operated thereby for controlling said connections, the spring *t*, the arm *s* on the rock-shaft, the lever *m*, a power-spring connected therewith, a trigger for holding the said lever, a slotted link connection between the lever *m* and the arm *s*, the stop-motion finger connected with the arm *s*, the brake device, the catch therefor and the connection between the said catch and the arm *s*, substantially as described.

22. A thread-gage for stop-motions of knitting-machines consisting of an adjustable disk having different-sized holes therein and a guard-wire held at one end at the center of the disk extending thence adjacent to the opening thereof and having an elongated terminal extension, substantially as described.

23. In combination in a thread-gage, a disk having holes and adjustable axially and a guard-wire attached at one end at the center of the disk and extending thence adjacent to one of the holes, substantially as described.

24. In combination in a stop-motion, a power member, a trigger controlling the same, stop-motion-controlling devices for operating the trigger, shipper devices connections thereto from the power member, said power member being adapted to reset the trigger and the controlling devices, substantially as described.

25. In combination in a stop-motion, controlling devices, connections leading therefrom comprising a lever and a trigger, shipper devices connected with the lever, said lever being arranged to give a positive resetting movement to the trigger, substantially as described.

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

FRANK WILCOMB.

Witnesses:

CARRIE G. CORSON,
HAROLD CORSON.