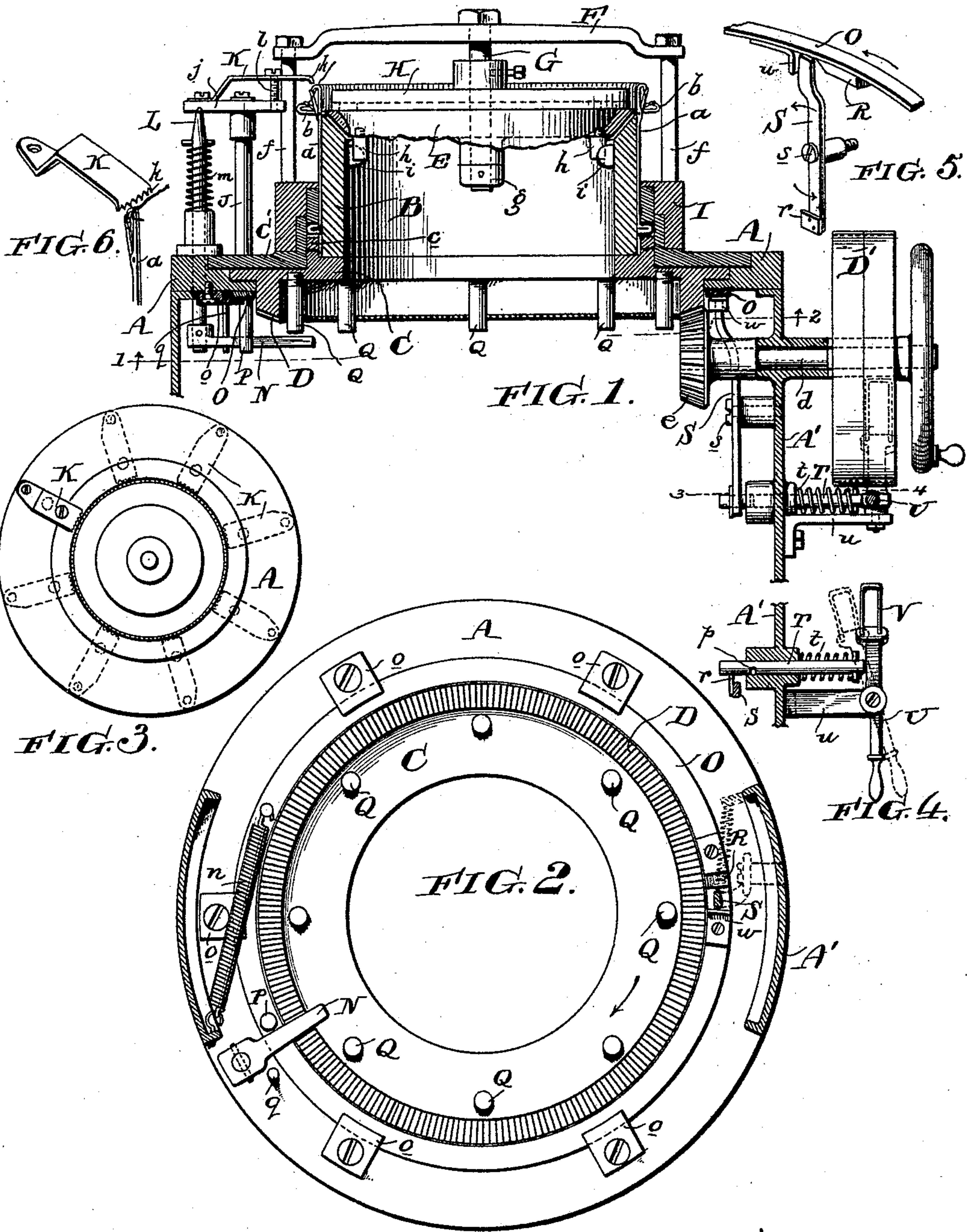


(No Model.)

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STOP MOTION FOR KNITTING MACHINES.

No. 498,076.

Patented May 23, 1893.



Witnesses:

Henry D. ...  
Charles W. ...

Inventors:

Abner McMichael  
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By their attorney  
[Signature]



# UNITED STATES PATENT OFFICE.

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## STOP-MOTION FOR KNITTING-MACHINES

SPECIFICATION forming part of Letters Patent No. 498,076, dated May 23, 1893.

Application filed June 3, 1892. Serial No. 435,342. (No model.)

*To all whom it may concern:*

Be it known that we, ABNER McMICHAEL and FRANK B. WILDMAN, both of Norristown, in the county of Montgomery and State of Pennsylvania, have invented an Improvement in Stop-Motions for Knitting-Machines, of which the following is a specification.

Our invention relates to stop motion mechanism for knitting machines, and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings which form a part thereof.

It is the object of our invention to provide a knitting machine with convenient stop motion mechanism for automatically stopping the operation of the knitting head whenever a lump or knot in the thread reaches the needles.

In the drawings:—Figure 1 is a sectional side elevation of a circular knitting machine embodying our improvements. Fig. 2 is an inverted sectional plan view of the same on the line 1—2 of Fig. 1. Fig. 3 is a plan view on a reduced scale of the knitting head. Fig. 4 is a horizontal plan view of a portion of the belt shifting devices of the stop motion mechanism on the line 3—4 of Fig. 1. Fig. 5 is a perspective view of the cam and lever for operating the belt shifting devices; and Fig. 6 is a detail perspective view of one of the needles and the thread arresting finger.

A is the stationary frame of the machine and A' are the supports or legs thereof.

B is the needle cylinder which may be formed in the ordinary way.

C is the rotating ring carrying the needle cylinder B. c is the cam for operating the vertical needles a. C' is an annular cam ring which carries the cam c.

D is a beveled gear on the ring C by which the ring is rotated from the pulley D' through the shaft d and beveled pinion e.

E is the horizontal needle plate which carries the horizontal needles b.

F is the cross bar carried by the uprights f, from which the needle plate E is suspended by the stud G and collar g.

H is the cam plate for operating the horizontal needles b, carried by the stud G.

I is a ring piece surrounding the cam c. The particular construction of the knitting head itself is however immaterial to our invention, which relates particularly to the stop motion devices for stopping the operation of the knitting head when the thread is knotted or provided with a lump.

J is an upright carried by a stationary part of the machine having an arm or projecting part j journaled upon its upper end.

K is a finger carried by the arm j and having its end located immediately adjacent to the point where the thread passes to the needles. The end of this finger K may be provided with teeth or a roughened or forked edge as shown in Fig. 6. The thread may normally pass to the needles a, b, without engaging with the end of the finger K, but if any knot or lump should be present in the thread it will be caught in the end of the finger. It is apparent that the particular construction of this lump or knot catching finger may be varied in many ways without in any way affecting its operation or changing the invention. The finger K may be formed of spring metal and may be adjusted by an adjusting screw l.

L is a vertically sliding rod journaled in the frame A and normally pressed upward by the spring m. The arm or projection j is normally in a position above the end of the rod L and holds the same in a depressed position against the action of the spring m.

N is an arm or projecting part carried by the lower end of the sliding rod L under the frame A.

O is a rotary ring located under the frame A and movable in guides o.

P is a pin or lug carried by the ring O and located adjacent to the arm or projecting piece N of the rod L. The ring O is held in normal position by a spring n.

Q is a series of pins or lugs carried by the rotary driving ring C located adjacent to the arm N of the rod L but normally above the same so as not to strike it, while the rod L is depressed by the action of the arm j.

R is a cam carried by the plate or ring O.

S is a lever pivoted as at s to the extension A' of the frame A having one end arranged



to be operated by the cam R and the other end provided with a feather *r* adapted to engage a notch or recess *p* of a sliding bolt T. This bolt T slides in the extension A' of the frame and is normally projected forward by a spring *t*, except when held by the feather *r* of the lever S.

U is a lever pivoted in a bracket *u* of the frame and carrying a belt shifter V. The end of the bolt T bears against the lever U and tends to shift it when permitted to operate.

*q* is a pin or lug on the bottom of the frame A to limit the backward movement of the arm N.

*w* is a projection or lug on the ring O adjacent to the cam R thereon and adapted to strike the upper end of the lever S to restore it to its normal position after it has been operated by the cam R, when the ring O returns to its normal position through the action of the spring *n*.

The operation of the apparatus is as follows: The thread from the guide is led to the needles *a, b*, which operate in the usual manner. If at any time a lump or knot is present in the thread, upon reaching the finger K it will be caught thereby and as the machine continues to operate, the tension upon the thread which passes to the needles will rock the finger K and arm *j* to one side, moving the arm *j* from above the rod L which will be instantly lifted by its spring *m*. This lifting of the rod L raises the arm N into a position to be struck by one of the pins or lugs Q of the rotating plate C, by which it is rocked against the pin or lug P on the ring O thereby turning the ring against the action of the spring *n*. This movement of the ring O brings the cam R in contact with the end of the lever S thereby rocking it and moving the feathered end *r* out of the notch *p* in the bolt T. The bolt when thus released is instantly projected forward against the lever U and moves the belt shifter V so as to move the belt from the fast to the loose pulley. The knitting machine is thus instantly brought to a stand still automatically whenever a knot or lump reaches the needles. When the machine is to be started in operation again, the finger K is readjusted and rod L depressed. The belt shifter V is then operated and the lever U forces the bolt T back against the action of the spring until the feathered end *r* engages the notch *p* and thus locks the bolt. The lever S is returned to its normal position by the projection or lug *w* on the ring O, which strikes the lever S and throws its end *r* into the notch *p*. The spring *n* draws the ring back to its normal position and thus causes the lug or projection *w* to act upon the upper end of the lever S as described. It is apparent however that a separate spring may be employed to return the lever to its normal position, as shown in dotted lines in Fig. 2. When a number of threads are employed in the knitting operation, a corresponding number of knock off fingers K may be employed with corresponding parts,

as shown in dotted lines in Fig. 3, each finger K acting whenever necessary in the manner described.

While we prefer the details of construction that have been shown we do not intend to limit our invention to them as it is apparent that they may be varied without changing the invention.

What we claim as new, and desire to secure by Letters Patent, is—

1. In stop motion mechanism for knitting machines, the combination with a rotary driven part of the knitting machine carrying one or more pins or projections, of a movable rod or part carrying a projection adapted to be struck by a pin or projection of the rotary driven part, a movable plate adapted to be operated by the projection of the movable rod, a movable thread controlled knock off finger normally acting upon the rod to hold it out of the path of the pin or projection of the rotary driven part of the knitting machine, and shifting devices for throwing the driving mechanism out of operation operated by the movable plate.

2. In a stop motion mechanism for knitting machines, the combination with a rotary driven part of the knitting machine carrying one or more pins or projections, of a movable rod or part carrying a projection adapted to be struck by a pin or projection of the rotary driven part, a movable plate adapted to be operated by the projection of the movable rod, a movable thread controlled knock off finger normally acting upon the rod to hold it out of the path of the pin or projection of the rotary driven part of the knitting machine, a belt shifter, a movable bolt to operate the shifter, and a locking lever to hold the bolt out of operation controlled by the movable plate.

3. In stop motion mechanism for knitting machines, the combination with the rotary driven part of the knitting head provided with one or more pins or projections, of the upright J, the movable knock off finger K carried by the upright J, the movable spring pressed bolt L normally depressed by the finger K and provided with a projection N adapted to be struck by the pin or projection of the rotary driven part of the knitting head when the bolt is raised, the movable ring plate O having the pin P, and the shifting devices controlled by the movable plate.

4. In stop motion mechanism for knitting machines, the combination with the rotary driven part of the knitting head provided with one or more pins or projections, of the upright J, the movable knock off finger K carried by the upright J, the movable spring pressed bolt L normally depressed by the finger K and provided with a projection N adapted to be struck by the pin or projection of the rotary driven part of the knitting head when the bolt is raised, the movable ring plate O having the pin P, the spring *n* connected with the plate O, cam R carried by the plate, lever



S operated by cam R, the belt shifter and movable bolt or part for operating the shifter controlled by the lever S.

5 In a stop motion mechanism for knitting machines, the combination with shifting devices for throwing the driving mechanism of the knitting head out of operation, of the movable knock off finger K arranged immediately adjacent to the thread which passes to  
10 the needles, the adjusting screw *l* for adjusting the finger K, and intermediate mechanism for operating the shifting devices held out of operation by the movable finger K.

6. In stop motion mechanism for knitting  
15 machines, the combination with a thread controlled knock off finger, of a movable projection N controlled thereby, a movable ring or plate O adapted to be moved by the projection N, a positively moved stop Q adapted to  
20 strike and move the projection N when the same is released by the knock off finger, and shifting mechanism for throwing the driving

devices of the knitting machine out of operation controlled by the movement of the ring or plate O.

7. In stop motion mechanism for knitting machines, the combination with a thread controlled knock off finger, of a movable projecting part N controlled by the finger, a movable ring or plate O adapted to be operated by the  
25 projecting part N, a spring *n* to restore the ring O to its normal position, the cam R and projection *w* on the ring O, lever S adapted to be operated by the cam R, the belt shifter, and spring pressed bolt to operate the belt  
30 shifter locked out of operation by the lever S.

In testimony of which invention we have hereunto set our hands.

ABNER McMICHAEL.  
FRANK B. WILDMAN.

Witnesses:

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S. T. YERKES.