

No. 755,975.

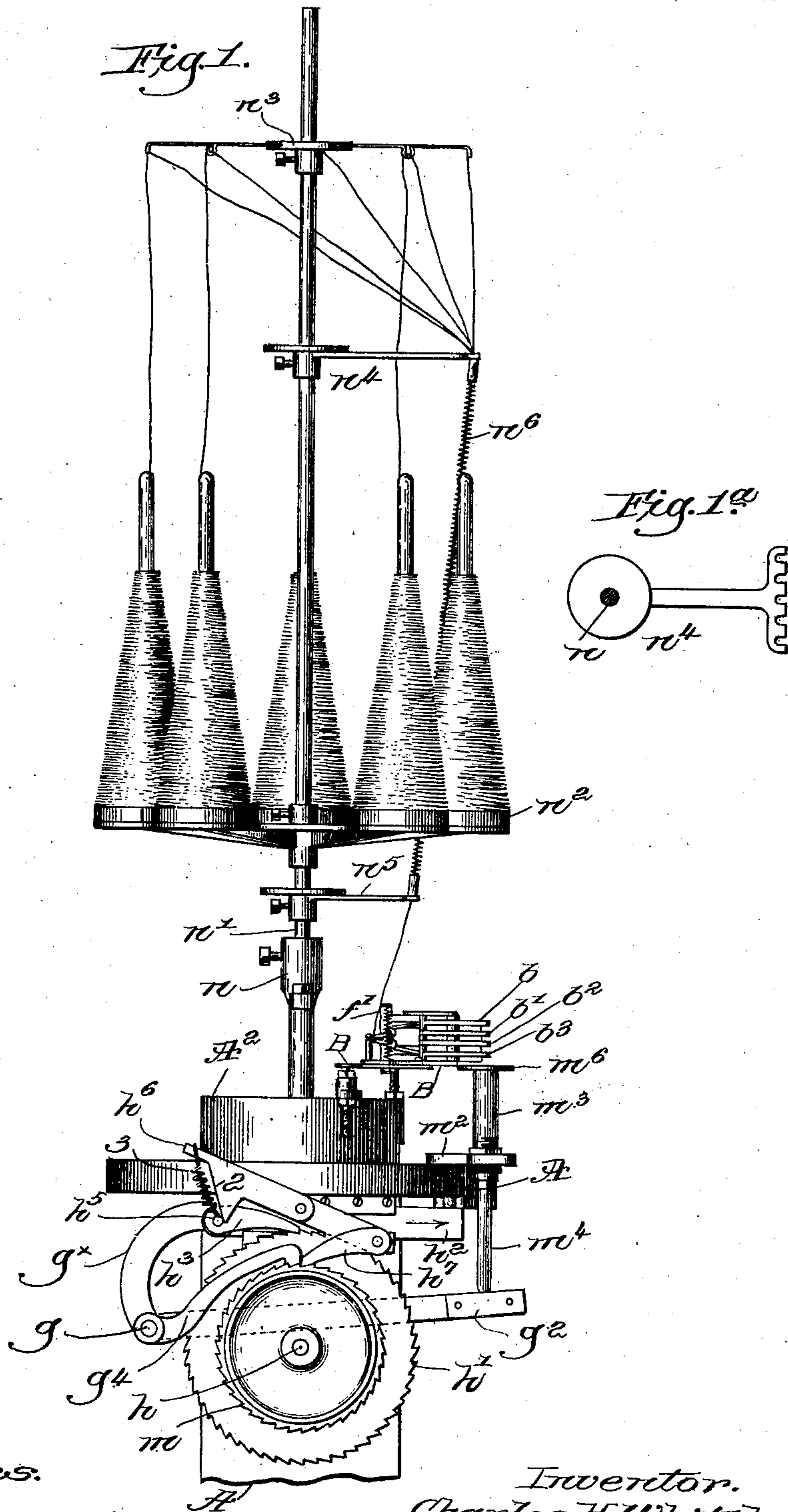
PATENTED MAR. 29, 1904.

C. H. WHITCHER.
THREAD PRESENTING MECHANISM FOR KNITTING MACHINES.

APPLICATION FILED JAN. 8, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.
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Charles H. Whitcher,
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No. 755,975.

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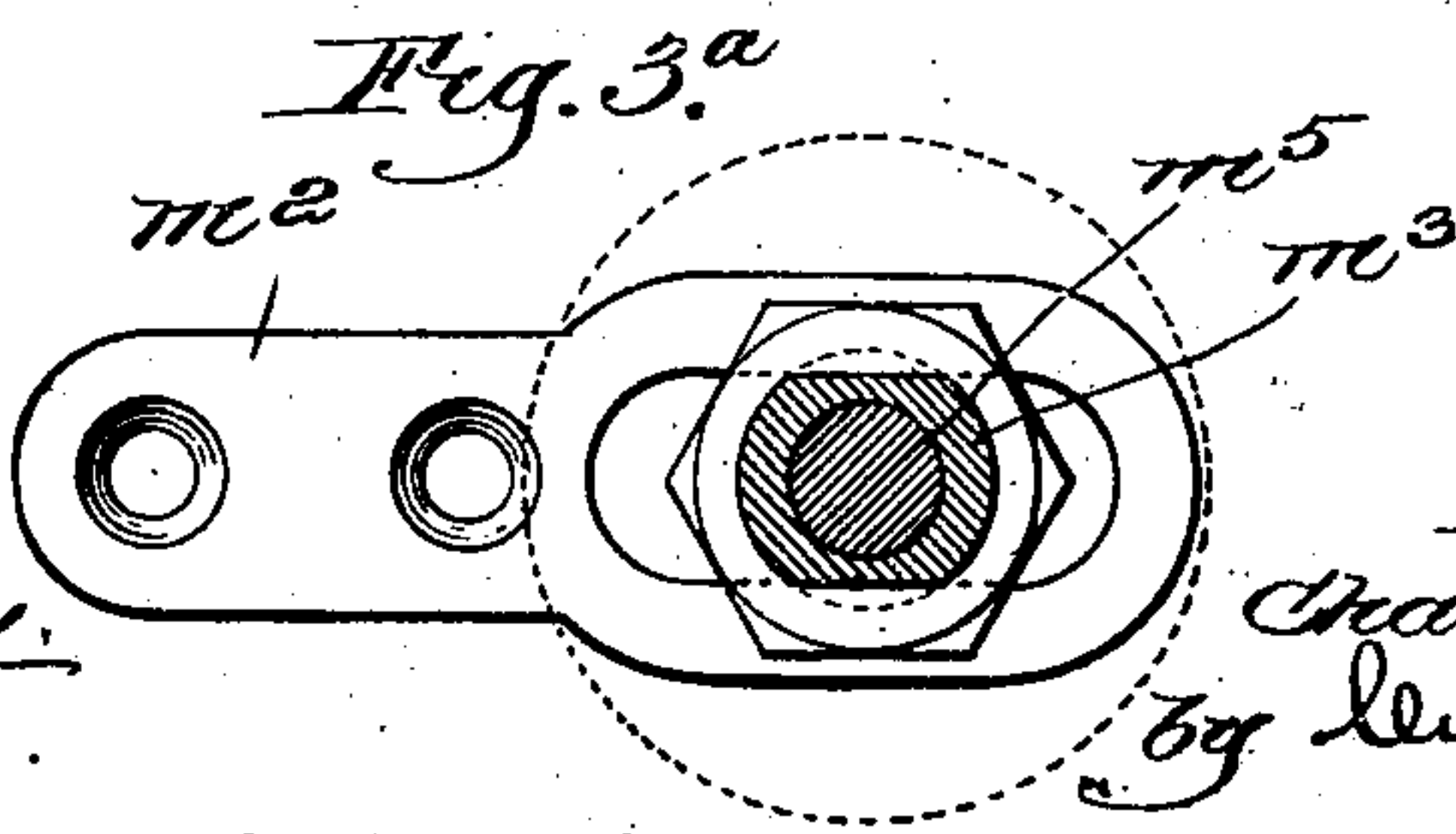
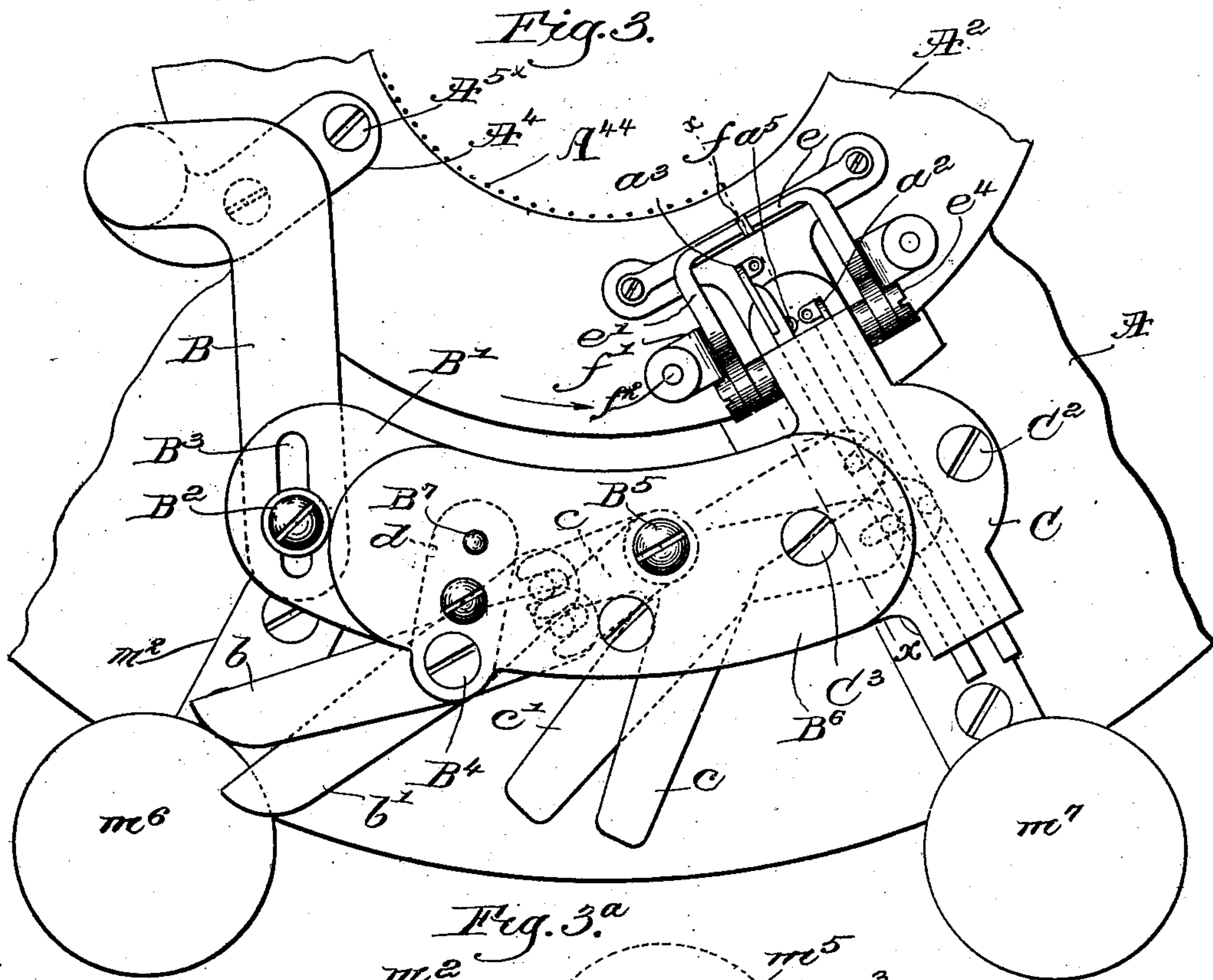
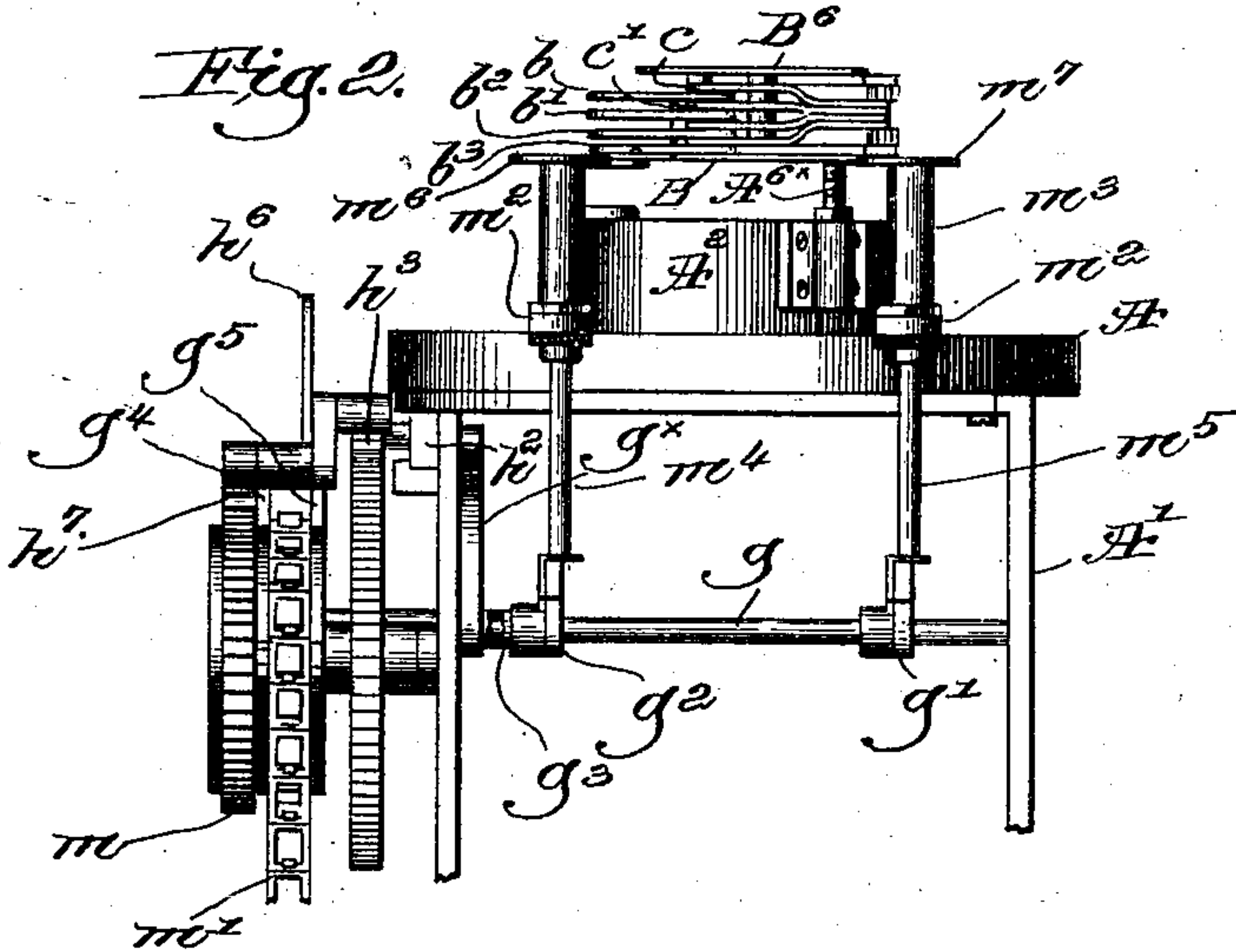
C. H. WHITCHER.

THREAD PRESENTING MECHANISM FOR KNITTING MACHINES.

APPLICATION FILED JAN. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 2.



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No. 755,975.

PATENTED MAR. 29, 1904.

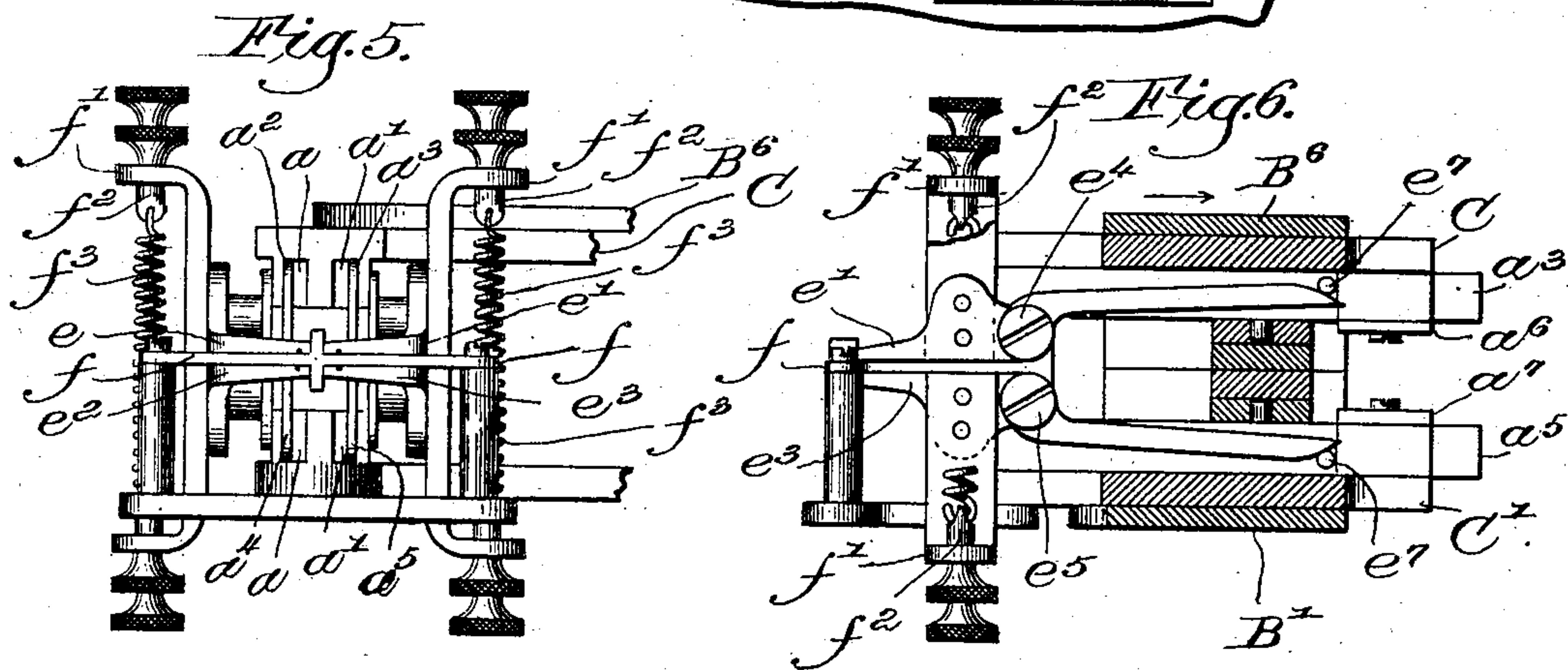
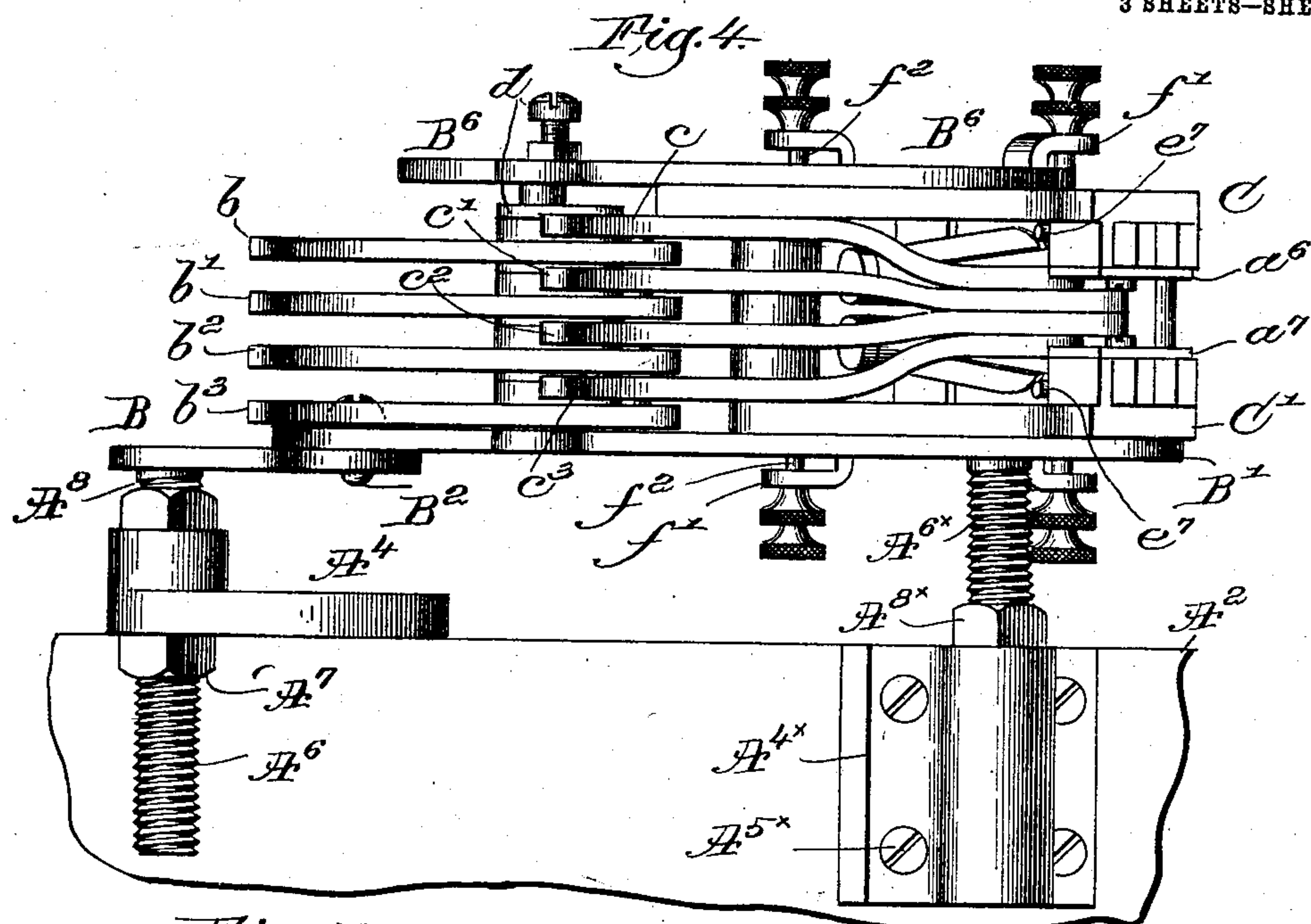
C. H. WHITCHER.

THREAD PRESENTING MECHANISM FOR KNITTING MACHINES.

APPLICATION FILED JAN. 6, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES H. WHITCHER, OF IPSWICH, MASSACHUSETTS.

THREAD-PRESENTING MECHANISM FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 755,975, dated March 29, 1904.

Application filed January 6, 1902. Serial No. 88,536. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. WHITCHER, a citizen of the United States, residing at Ipswich, county of Essex, and State of Massachusetts, have invented an Improvement in Thread-Presenting Mechanism for Knitting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to novel mechanism for presenting threads of different colors to the needles in knitting-machines, the devices for presenting the threads being controlled automatically by a suitable pattern mechanism.

Figure 1 in side elevation represents a sufficient portion of a knitting-machine with my improvements added in one of the best forms now known to me to enable my invention to be understood. Fig. 1^a is a plan view of one of the arms n^4 or n^5 . Fig. 2 is a view of part of the apparatus shown in Fig. 1 looking at the same from the right. Fig. 3 is an enlarged plan view of the thread-presenting devices. Fig. 3^a is a plan view of one of the actuator-stands. Fig. 4 is a side elevation of the devices shown in Fig. 3. Fig. 5 is an enlarged detail showing the thread-deliveries and the parting mechanism; and Fig. 6 is a section in the line x , Fig. 3.

My improved thread-presenting mechanism may be applied to any well-known form of circular-knitting machines using latch-needles, and I have consequently shown herein only that part of a well-known knitting-machine which sustains the thread-presenting mechanism and a shaft of the machine which is controlled by the pattern mechanism to actuate at the proper times the devices for putting the thread in and out of working position.

Referring to the drawings, let A represent the table, plate, or bed of any usual circular-knitting machine, A' suitable legs to sustain it, and A² part of a cylinder having cams for reciprocating the needles that they may knit in usual manner, the row of needles being generally designated by A⁴. I have provided the cylinder at its upper side (see Fig. 3) with a stand A⁴ and at its side with a second stand A^{4x}, secured to said cylinder by suitable

screws A^{5x}. These stands receive, respectively, screw-threaded posts A⁶ and A^{6x}, that depend, respectively, from or form part of two plates B and B', connected by a screw B² and forming a support for the thread-presenting devices to be described. Each of these posts A⁶ and A^{6x} has a suitable nut, as A⁸ A^{8x}, by which to adjust the post vertically to position accurately the thread-presenting devices to be described. The screw B² is screwed into the plate B and passes through a slot B³ in the plate B', so that when the said screw is loosened the plate B' may be turned out or in about the post A^{6x} to properly present the ends of the levers for moving the thread-guides with relation to the means to be described for actuating them. The plate B' is provided with two stud-screws B⁴ and B⁵, said screws being passed through a cap-plate B⁶, said cap-plate also fitting over the upper end of a stud B⁷, erected on the plate B'.

Between the plates B' and B⁶, I have applied a suitable guide-frame C C', held together by a suitable screw C², other screws, as C³, one for each of the two parts C C' of the guideway, holding the latter in position between the plates B' and B⁶. Each of the guideways C and C' has, as herein shown, two slots, as a and a' , in which are located the thread-guides to be herein described and designated a^2 a^3 a^4 a^5 . The shanks of these thread-guides are extended backwardly, as shown in Figs. 3 and 6, each pair of thread-guides being retained in its groove by a suitable cap or washer a^6 a^7 , held in place by a suitable screw.

The screw B⁴ has mounted upon it a series of levers b b' b^2 b^3 , each provided with a pin and each engaging a slot of a series of three-armed levers c c' c^2 c^3 , and one of the arms of each of these levers has a suitable slot that engages a suitable pin on one of the thread-guides, each lever actuating one thread-guide, the movement of the series of levers in one or the other direction sliding the thread-guides and putting them either in their operative positions, as shown by the thread-guide a^3 in Fig. 3, or in their inoperative position, as shown by the thread-guide a^2 in said figure. The series of levers c c^3 has one of its arms extended outwardly beyond the cap-plate B⁶.

The series of levers $c\ c^3$ are fulcrumed on the screw B^5 .

To increase the strength of the apparatus, the post B^7 is provided with a series of braced friction-pieces d , all alike and shown chiefly by dotted lines in Fig. 3, parts of said friction-pieces surrounding the screw B^4 and acting to retard the movement of the levers $b\ b'$, &c.

To part the thread which is not to be used in knitting the fabric, I have provided a series of parting devices, (designated $e\ e'\ e^2\ e^3$,) they being made as levers having their fulcra on one of the two stud-screws e^4 or e^5 , the inner ends of said parting devices being beveled to form cam-surfaces, as shown in Fig. 6, to be struck by suitable projections, as e^7 , one on each of the thread-guides, so that when the said thread-guides are moved forwardly, as represented by the thread-guide a^3 , Fig. 3, the parting device coacting with it will be lifted to let the thread run freely between it and the rest f to the needles, that the latter may in usual manner take the thread and knit. Each lever or parting device has connected with it a suitable lug, as f' , that sustains a stud f^2 , each pair of said studs being connected by a suitable spiral spring f^3 , said springs acting normally to close the acting ends of the thread-parting devices against the rest f . The upper side of the rest f sustains at all times the threads passing from the thread-guides a^2 and a^3 ; but the threads passing from the thread-guides a^4 and a^5 are drawn over and sustained by the parting devices e^2 and e^3 when they are being delivered to the needles; but at all other times the said parting devices force the threads of said thread-guides against the under side of the rest f , as shown in Fig. 5.

I have provided the framework of the machine with a suitable rock-shaft, as g , to which is connected a lever g' . The rock-shaft g is surrounded by a sleeve g^3 , having a lever g^2 , and said sleeve is sustained by the framework and by a bracket g^x , and the sleeve sustains the shaft g . The rock-shaft g has an arm g^4 . (Shown best in Fig. 1 and partially in Fig. 2.)

The frame has a suitable stud h , (see Fig. 1,) that sustains a ratchet-wheel h' , forming part of a pattern mechanism for welting or other purposes and common to knitting-machines. The wheel h' is ratcheted about step by step in usual manner by a slide-bar h^2 and a pawl h^3 carried thereby. I have illustrated the ratchet-wheel h' and its actuating mechanism chiefly because for simplicity I have employed the stud h^5 , on which the pawl h^3 is hung, as a means for actuating a lever h^6 , carrying the pawl h^7 , employed by me to actuate the ratchet-wheel m , employed to actuate the chain m used by me to determine the time of putting the thread-guides into and out of operative position.

I have attached to the bed of the machine in suitable manner suitable stands m^2 , one of which is shown in Fig. 1 and detached in Fig.

3^a. These stands have slots and sustain suitable hollow bearings m^3 for rods $m^4\ m^5$, provided, respectively, at their upper ends with actuators $m^6\ m^7$, said actuators being represented as disks, the actuator m^6 always serving to move a thread-guide into its operative position and the actuator m^7 to move a thread-guide into its inoperative position. The rods m^4 and m^5 are raised and lowered by the levers g' and g^2 , before referred to, controlled as to their movements by suitable links of the pattern-chain m' . To enable the cylinder to be turned and actuate the needles without knitting, the lowest position of the actuators is shown by the actuator m^6 , Fig. 1. The actuator m^6 may be moved from this position by the pattern-chain to get it in line with the path of movement of either of the levers $b\ b'$, &c., according to which of the thread-guides it is desired to put into its operative position, and whenever a thread-guide is to be moved into its inoperative position the actuator m^7 will be lifted to strike the proper arm of one of the series of levers $c\ c'$, &c., the actuator m^6 always operating in advance of the actuator m^7 . Whenever the slide h^2 , carrying the pawl h^3 , is moved in the direction of the arrow thereon, Fig. 1, the pin h^5 meets the incline 2 of the lever h^6 and causes the pawl h^7 to turn the pattern mechanism; but whenever the slide h^2 is moved in the opposite direction the spring 3 moves the lever h^6 to retract the pawl.

Erected on the cam-cylinder in suitable manner is a yoke n , that sustains a rod n' , carrying a suitable spider n^2 , on which rests the bobbins containing the thread to be used in knitting. Said rod also carries a plate n^3 , containing suitable guide-eyes, one for each of the threads used, and also it has adjustably connected with it arms n^4 and n^5 , each provided at its end with a suitable opening for each of the threads used, and the corresponding pairs of holes in the arms n^4 and n^5 are united by a series of coiled springs n^6 , so that each thread is led from the spools to the thread-guides through suitable flexible guides that obviate any liability of the threads becoming tangled or broken during knitting.

It will be readily understood from the foregoing description that any thread-guide may be brought into operative position by raising the actuator m^6 and putting it in the path of movement of one of the levers $b\ b'$, &c., and that said thread-guide will remain in operation until the actuator m^7 is put into the line of movement of the outwardly-extended arm of one of the levers $c\ c'$, &c., which coacts with the corresponding lever $b\ b'$, &c. Whenever a thread-guide is put into its operative position, the thread-parting device coacting with the thread carried by said thread-guide is moved to release the thread that the end of the thread dangling beyond the inner face of the rest may be taken by the needles as they

rise into their thread-taking position, the movement of the thread-guide into operative position being sufficient to carry the loose end of the thread into engagement with the needles. Whenever, however, a thread-guide is to be put into its inoperative position, it will be moved in the direction of the arrow, Fig. 6, and just before the thread-guide completes its outward stroke the pin *e'* permits the parting device to move and clamp the thread, and thereafter as the cylinder rotates the thread will be parted and its free end held at the rest. As soon as the thread-guide is started forwardly the thread-parting device is moved away from the rest.

I may in this machine use in the regular thread-guide of the knitting-machine a thread to knit the body of a fabric, and I may by the thread-guides shown and described introduce at any time threads differing in color or material and plait or knit them into the face of the fabric knitted by the body-thread.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a thread-presenting mechanism, a plurality of independently-movable thread-guides, means to guide the same, and a pair of levers for each of said thread-guides, operative connections between the levers of each pair to cause one lever to be moved by the other to put the thread-guide connected therewith either into its operative or inoperative position and positive means for moving each one of the levers of each pair.

2. In an independently-movable thread-presenting mechanism, a plurality of thread-guides, means to guide the same, and a pair of levers for each of said thread-guides, operative connections between the levers of each pair to cause one lever to be moved by the other to put the thread-guide which is connected therewith either into its operative or inoperative position, a plurality of actuators, means to control the position of said actuators singly, that each may act in turn upon each of its own series of levers to put the thread-guide into its operative or inoperative position as desired.

3. In a thread-presenting mechanism for knitting-machines, a thread-guide, means to guide the same, a lever connected to the thread-guide to move said thread-guide into its inoperative position, a second lever connected to the first-mentioned lever for moving the thread-guide into its operative position, means for acting upon said first-mentioned lever to move the thread-guide into inoperative position, such movement of said first-mentioned

lever causing the second lever to be moved into position that it may be directly actuated when it is again desired to put the thread-guide into operative position.

4. In an apparatus for presenting thread to knitting-machine needles, a pair of levers, means to connect said levers, and a thread-guide engaged directly by one of said levers, and independent means to actuate each of said levers, each lever when turned in one direction moving the other lever in the opposite direction to put it in position to be acted on by its actuating means.

5. In a thread-presenting mechanism, a rest to sustain the thread near the line of action of the needles, a thread-parting device cooperating with said rest, a thread-guide, means to move said thread-guide to and from the line of needles to put the guide into its operative or inoperative position to cause the thread carried by it to be knit or not knit, and devices controlled by the movement of the thread-guide to move the parting device for the thread carried by said guide away from the thread-rest when the thread-guide is moving into its operative position toward the needles and to effect the movement of the parting device toward said rest to clamp the thread carried by the guide when said guide is moving into its inoperative position away from the line of needles.

6. In a thread-presenting mechanism, a rest to sustain the thread near the line of action of the needles, a plurality of thread-parting devices cooperating with the opposite faces of said rest, a series of thread-guides, and devices to actuate either of said thread-guides and put the same into its operative or inoperative position, and devices controlled by the movement of said thread-guide to move its parting device away from the thread-rest when said thread-guide is coming into its operative position and to effect the movement of the parting device toward said rest when the thread-guide is moving into its inoperative position.

7. In a knitting-machine, a series of thread-guides, and a series of longitudinally-flexible spiral springs through which the thread going to the thread-guide is conducted on its way from the bobbins to the thread-guides, said spring preventing injury to the thread.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES H. WHITCHER.

Witnesses:

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EDITH M. STODDARD.