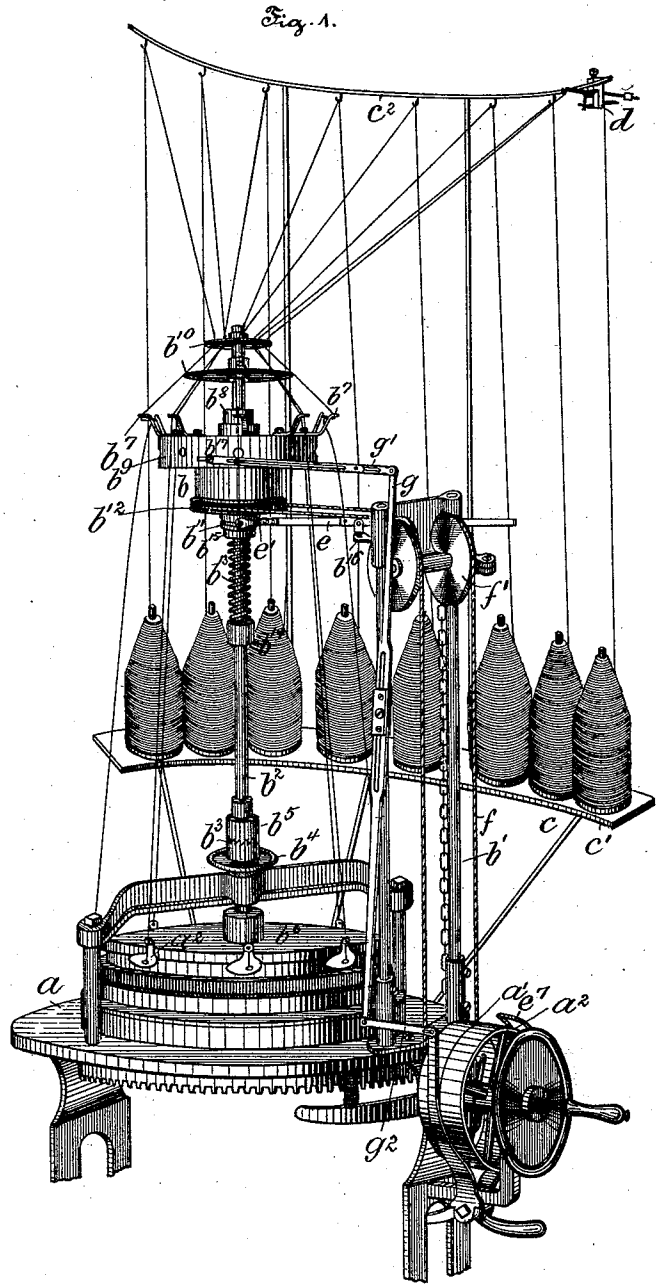
(No Model.) 4 Sheets—Sheet 1.

D. C. BELLIS.

STOP MOTION FOR KNITTING MACHINES.

No. 455,786. Patented July 14, 1891.

Fig. 1.



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D. C. BELLIS.

STOP MOTION FOR KNITTING MACHINES.

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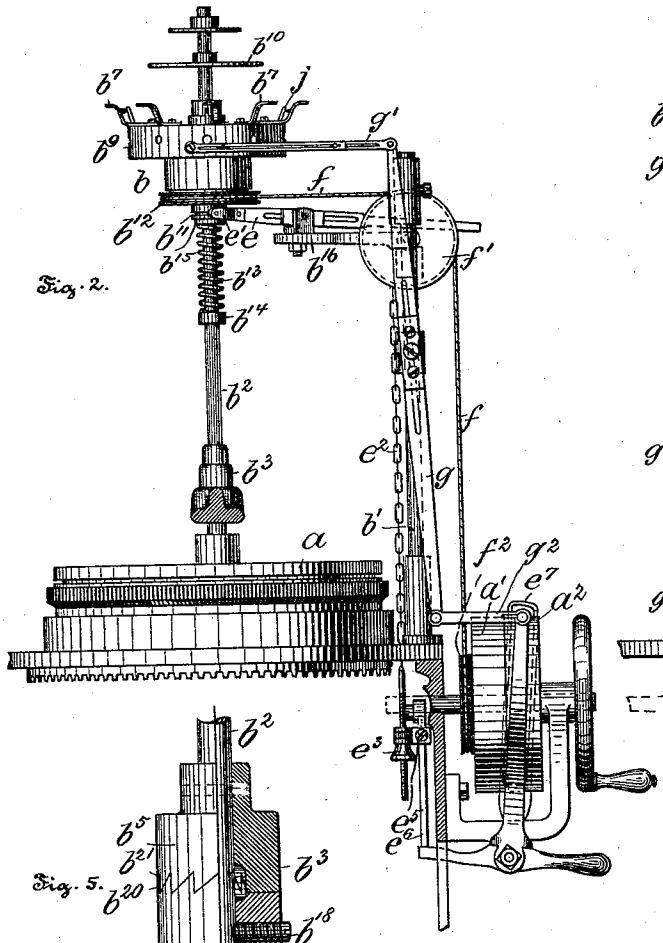


Fig. 2.

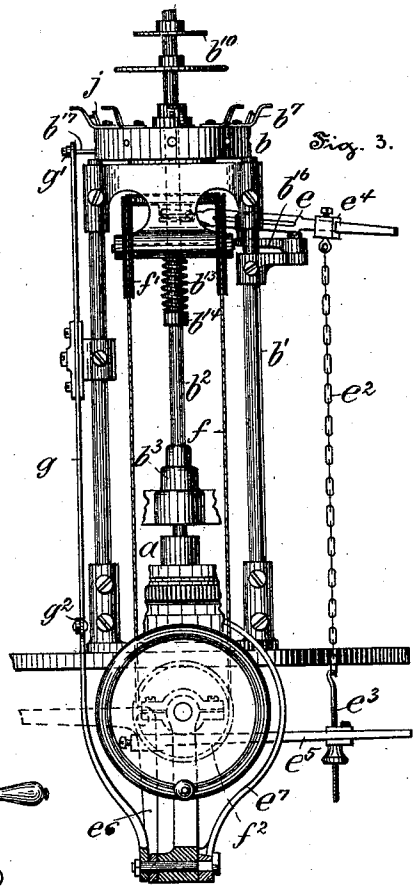


Fig. 3.

Fig. 5.

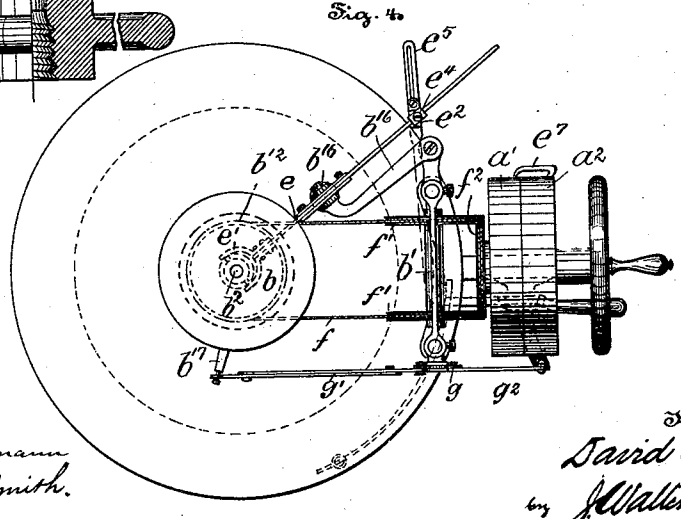


Fig. 4.

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(No Model.) 4 Sheets—Sheet 3.

D. C. BELLIS.

STOP MOTION FOR KNITTING MACHINES.

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Fig. 6.

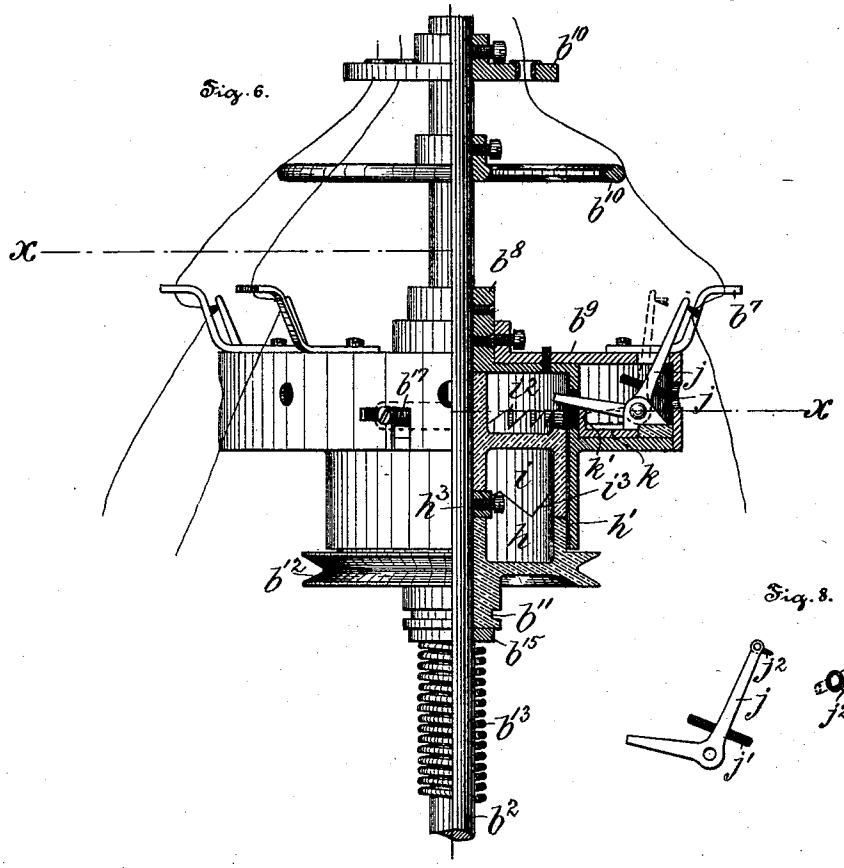
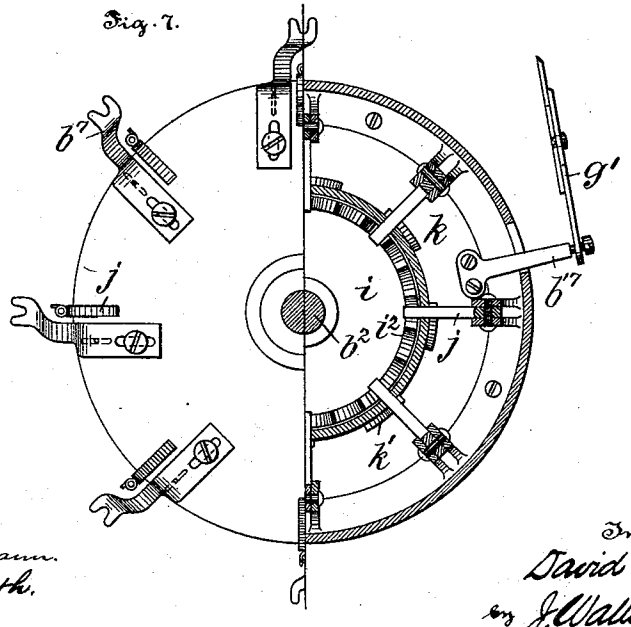


Fig. 8.

Fig. 7.



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(No Model.) 4 Sheets—Sheet 4.

D. C. BELLIS.

STOP MOTION FOR KNITTING MACHINES.

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Fig. 9.

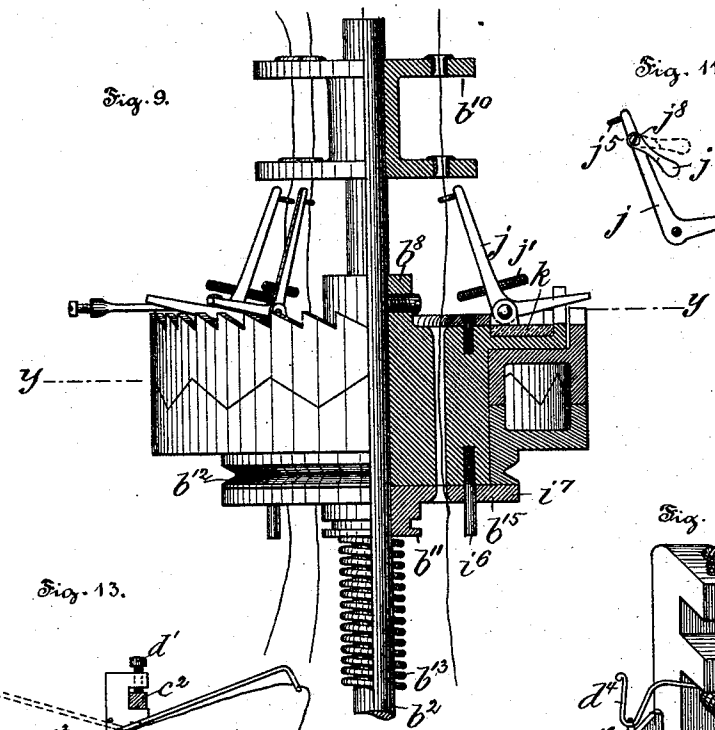


Fig. 11.

Fig. 15.

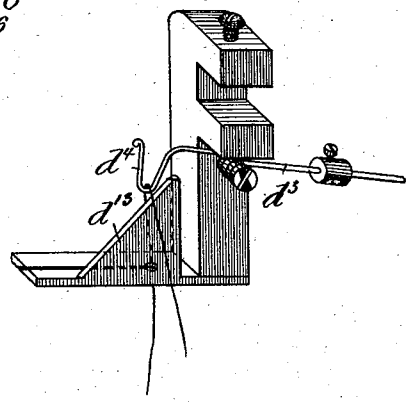


Fig. 13.

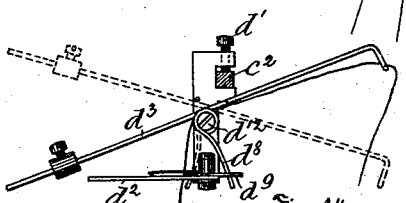


Fig. 14.

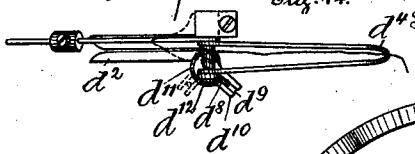


Fig. 10.

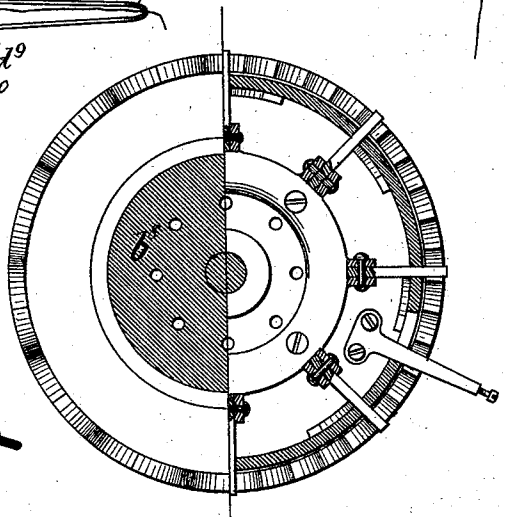
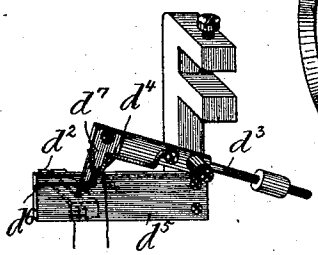


Fig. 12.



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UNITED STATES PATENT OFFICE.

DAVID C. BELLIS, OF PHILADELPHIA, PENNSYLVANIA.

STOP-MOTION FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 455,786, dated July 14, 1891.

Application filed March 12, 1891. Serial No. 384,789. (No model.)

To all whom it may concern:

Be it known that I, DAVID C. BELLIS, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Stop-Motions for Knitting-Machines, of which the following is a specification.

The principal objects of my present invention are, first, to provide simple, durable, compact, and efficient yarn or thread controlled mechanism for automatically throwing a knitting-machine out of gear when the supply of yarn or thread thereto is interrupted, for example, by the breaking or rupture of any of the strands of the yarn or the thread by exhausting the supply of the same on one or more of the bobbins or when the tension on any of the strands of yarn from any cause becomes unduly slackened; second, to so arrange the parts of the yarn-controlled stop mechanism as that the same, after having been automatically shifted in order to stop the knitting-machine, are automatically returned again to their respective normal positions without any manual readjustment thereof and by the operation of starting the machine; third, to provide an automatic stop-motion mechanism that can be adjusted so as to be readily applied to or used in connection with knitting-machines of any of the usual sizes, types, or patterns; fourth, to protect the working parts of the stop-motion from dust and from becoming covered with the so-called "fly" or fibers of thread that have become detached from the yarn or thread, and, fifth, to provide efficient and inexpensive yarn-controlled devices especially adapted for use in connection with the above-mentioned stop mechanism and adapted to slacken the threads of yarn by cutting or severing them whenever the yarn or thread binds or tangles on any of the bobbins or whenever the yarn or thread is uneven or knotted.

My invention consists of a stop-motion for knitting-machines, comprising a sectional clutch in which each member thereof has an inclined contact-surface and one of said members rotated with the machine and the other or free member in its normal condition or position frictionally driven by the rotating member, yarn-controlled devices for checking said free member so as to permit the inclined contact-surfaces to shift one of the members axially, and means connected with one of said members for stopping the machine and the rotating member.

My invention further consists of a stop-motion for knitting-machines, comprising a driving-shaft, a device for connecting and disconnecting the machine therewith, a two-part sliding and friction clutch in which one member thereof is driven with the machine and the other is free, yarn-controlled levers for engaging the free member, means connected with one of said members for actuating said connecting device to disconnect the machine and main shaft, cams for shifting said levers out of engagement with the rotating member, link connections attached to said connecting device, and cams for shifting the levers out of engagement with the clutch when the machine is started.

My invention further consists of a stop-motion for knitting-machines, comprising a two-part clutch, yarn-controlled levers, thread-guides, and a two-part coupling whereof one part is connected with the yarn-controlled levers and the other part with the thread-guides for permitting said thread-guides and levers to be shifted into and maintained in line with each other.

My invention further consists of a stop-motion for knitting-machines, comprising a two-part friction and sliding clutch and yarn-controlled levers provided with adjustable counter-weights and swiveled eyes and adapted to engage and check one member of said clutch in order to actuate the same.

My invention further consists of a stop-motion for knitting-machines, provided with a yarn-cutter comprising a thread-gage, a blade, and a counterbalanced lever provided with an eye and adapted to normally prevent the contact of the thread and knife edge or blade; and my invention further consists of the improvements hereinafter fully described, and pointed out in the claims.

The nature and objects of the invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, and in which—

Figure 1 is a perspective view of a knitting-

machine, showing stop-motion mechanism embodying features of my invention in application thereto. Fig. 2 is a view, partly in side elevation and partly in section, of the upper portion of a knitting-machine having the stop-motion mechanism applied thereto and showing a chain for actuating the belt-shipper to stop the machine, and also showing link connections for automatically readjusting the parts of the stop-motion by the operation of starting the machine. Fig. 3 is an end elevation, partly in section, of Fig. 2, showing an endless band for transmitting rotary motion from the driving-pulley of the machine to the stop-motion mechanism. Fig. 4 is a top or plan view of Fig. 2, showing two vertical posts attached to the bed-plate of the machine for supporting levers and links connected with the stop-motion mechanism and with the power-shifting appliances of the machine. Fig. 5 is an elevation, partly in section, of a two-part coupling whereof one part is connected with the center shaft of the dial-plate and is provided with a hand-wheel for adjusting said plate and the other part is connected with the yarn-controlled levers of the stop-motion mechanism. Fig. 6 is a view, partly in elevation and partly in section and on an enlarged scale, of the upper portion of the stop-motion mechanism, showing a housing containing a rotatable two-part friction-clutch, whereof one member is afforded a range of axial motion and the other member is free and is held against end play, and whereof each member is provided with an inclined contact-surface, also showing yarn-controlled levers for engaging projections on the free member and means for rotating the other member. Fig. 7 is a section on the line $x\ x$ of Fig. 6, showing guides for directing the yarn over the periphery of the housing containing the two-part clutch. Fig. 8 is a view illustrating in side elevation and in perspective the detail construction of the yarn-controlled levers, and showing an adjustable counter-balance and a swiveled eye attached to said levers. Fig. 9 is a view, partly in elevation and partly in section, of the upper portion of a modified arrangement of the two-part clutch and of the yarn-controlled levers, showing the strands of yarn passing through suitable recesses formed in the body of the stop-motion mechanism. Fig. 10 is a section on the line $y\ y$ of Fig. 9, showing cams for returning the yarn-controlled levers to their normal positions, and also showing a cam-carrier for shifting the same. Fig. 11 is an elevation, on an enlarged scale, of one of the yarn-controlled levers, showing a modified form of adjustable counter-weight, and also showing an eye attached rigidly to the lever. Figs. 12, 13, and 14 illustrate in perspective and in plan and elevation yarn-cutters provided with a thread-gage, a movable blade, and a counterbalanced lever having an eye and adapted to actuate the blade; and Fig. 15 is a perspective view of a modified form of yarn-cutter, showing a thread-gage, a fixed blade, and a counterbalanced lever for supporting the yarn and for permitting it to contact with the blade.

Referring to the drawings, especially to Fig. 1, a is a knitting-machine of any preferred construction and provided with fast and loose pulleys a' and a^2 or equivalent power-applying devices. b is the stop-motion mechanism adapted to throw the power appliance out of gear whenever a thread breaks or becomes unduly slack, and the same is supported by means of a frame b', attached to the bed-plate of the machine, and by means of a shaft b^2, preferably supported by the dial-plate. c is a bobbin-frame provided with a bobbin-shelf c' and a thread-rack c^2. d is a yarn or thread cutter attached to the yarn or thread rack c^2, and adapted to slacken the thread by cutting or severing it whenever the yarn is uneven or flocky or is subjected to an undue tension. In the drawings only one thread-cutter is shown; but it will be understood that in practice there are as many thread-cutters as there are threads, although the thread-cutters may, if preferred, be dispensed with, in which case, however, the efficiency of the stop-motion, as a whole, is greatly diminished.

Referring now to Figs. 1, 2, 3, 4, and 5, b^3 is a two-part coupling, whereof one part b^4 is attached to the dial-plate and the other part b^5 is attached to the shaft b^2, so that the dial-plate b^6 may be shifted in order to adjust the stitches of the machine without moving the thread-carriers b^7, whereby the said thread-carriers b^7 and thread-guides a^2 will be maintained in line with each other. The collar b^8, housing b^9, and thread-directing wheels or spreaders b^{10} are keyed or otherwise attached to the shaft b^2. b^{11} is a grooved sleeve mounted loosely on the shaft b^2 and provided with a pulley b^{12}. b^{13} is a spiral spring interposed between the collar b^{14} and a gasket b^{15}, in order to support the sleeve b^{11}, so that it is free to be rotated and is afforded a range of axial motion. e is a lever having a bifurcated extremity e' in engagement with the grooved sleeve b^{11} and pivotally attached at or near the center thereof to a bracket b^{16}, supported by the frame b'. It may be remarked that the bracket b^{16} is made in two sections hinged together by a set-screw, so that the extremity of the bracket may be shifted and then clamped to place, for a purpose hereinafter described. e^2 is a chain, rod, or equivalent device attached to the free extremity of the lever e by means of an adjustable sliding connection e^4 and to an arm e^5 by means of a turn-buckle e^3. The arm e^5 is attached to a bell-crank lever e^6, connected with the machine and adapted to control the belt-shipper e^7, so that when the stop-motion mechanism is thrown into operation, in the manner hereinafter described, the grooved sleeve b^{11} is shifted axially downward and actuates the lever e, thereby causing the chain e^2 to pull

the arm e^5 upward, and the motion of the arm e^5 causes the belt-shipping appliance to shift the belt from the fast pulley a' onto the loose pulley a^2, thereby permitting the machine to stop. It may be remarked that the sleeve b^{11} is rotated by means of an endless band f, passing over guide-pulleys f', supported by the frame b', and passing around the pulley b^{12}, and also around a pulley f^2, attached to or formed integral with the driving or fast pulley a' of the machine, so that as soon as the driving-belt of the machine is shifted from the fast to the loose pulley the machine and stop-motion are permitted to stop. b^{17} is a lever protruding through a slot in the housing b^9 and adapted to return the parts of the stop-motion mechanism to their normal positions whenever the machine is started. This lever b^{17} is pivotally connected at one extremity to an oscillating lever g by means of an adjustable link g'. The other extremity of the oscillating lever g is connected with the belt-shipping appliance by means of a slotted link g^2, so that whenever the machine is being started the belt is first shifted partially onto the tight pulley and starts the machine, and then as the belt is shifted farther onto the pulley the slotted link g^2 comes into engagement with the shipping device and transmits motion to the levers g' and b^{17}, thereby causing the parts of the stop-motion to be automatically and positively readjusted every time the machine is started.

It may be remarked that inasmuch as all the parts for connecting the stop-motion mechanism with the machine, including the bracket b^{16}, are adjustable and can be made larger and smaller or otherwise shifted in order to accommodate them to different sizes and patterns of machines it follows that the stop-motion may be applied to any preferred type or style of knitting-machine by the simple operation of attaching the frame b' to the bed-plate of the machine, the arm e^5 to the belt-shipping device, and the shaft b^2 to a threaded projection, which in most machines is formed upon the dial-plate b^6, and then adjusting the length of the various levers so as to accommodate them to the machine.

Referring now to Fig. 5, b^4 is one member of the coupling b^3, and is attached to the shaft b^2 by means of a set-screw b^{18}, and to the dial-plate b^6 in any convenient manner. This member b^4 is provided with a hand-wheel b^{19} for permitting of its rotation, and with a serrated contact surface b^{20}. b^5 is the other member of the coupling b^3, and is keyed or otherwise attached to the shaft b^2. This member b^5 is provided with a serrated contact-surface b^{21}, adapted normally to contact with and engage the serrated surface b^{20}, so as to connect the dial-plate and the shaft b^2 together. In use the two parts b^4 and b^5 of the coupling b^3 may be uncoupled by loosening the set-screw b^{18}, whereupon the dial-plate b^6 may be raised or lowered by means of the hand-wheel b^{19} or the thread-guides a^2, and the thread-carriers b^7 may be adjusted in line with each other without causing the yarn to become tangled.

Referring now to Figs. 6, 7, and 8, h is one member of a two-part clutch and is attached to or formed integral with the sleeve b^{11}, and is adapted to be revolved in the lower portion of the housing b^8. This member h is provided with an inclined contact-surface h', for a purpose to be presently described. h^3 is a collar keyed or otherwise attached to the shaft b^2, and located above the member h, in order to prevent the latter from being shifted upward. i is the other member of the two-part clutch and is mounted so as to be adapted to rotate freely on the shaft b^2, but is prevented from end-play by means of the collars h^3 and b^8. This member i is provided at the upper portion thereof with a row of projections i^2 and at the lower portion thereof with an inclined contact-surface i^3, adapted to engage the contact-surface h', so as to cause the member h to normally drive the member i by frictional contact therewith. j are counterbalanced yarn-controlled levers pivotally supported by a flange formed on the collar b^8 and located within the housing b^9, but having one of their respective extremities extended through suitable slots therein. These levers j are located adjacent to the thread-carriers b^7, and are adapted to be retained normally out of engagement with the projections i^2 of the free member i by the tension of the thread. However, in use whenever the tension of any of the threads is reduced, so that one of the threads becomes slack, one of the levers j engages one of the projections i^2, and thus checks the rotation of the free member i, whereupon the positively-rotated member h is shifted by means of the inclined surfaces h' and i^3 downward, and thus shifts the lever e and actuates the belt-shifter e^7, so as to stop the machine and permit the member h to come to rest, as has been hereinabove explained. k is a cam-carrier located within the housing b^9 and supported upon a flange attached to the collar b^8. This cam-carrier k is provided with cams k', adapted to contact with and return the levers j to their normal positions, and is attached to the arm b^{17}, so that the motion of the arm b^{17} causes all the levers j to be lifted out of engagement with the projections i^2 before the machine is started, and also causes the cams k' to be shifted from beneath the lever j before the machine is in operation. j' are externally-threaded counter-weights adapted to be screwed through suitable apertures in the levers j, in order to permit of the adjustment of the latter—that is to say, in order to increase or diminish the degree of slack in the thread requisite to cause the levers to operate to stop the machine. j^2 are **8**-shaped swivel-eyes pivotally attached to the levers j, as illustrated in Fig. 8. The object of these swivel-eyes is to permit the levers to be inserted through smaller slots in the housing

b^9 than would be possible if the eyes were attached rigidly to the levers, it of course being understood that the object of the housing b^9 is to prevent the deposition of dust and fibers of yarn upon the moving parts of the stop-motion mechanism.

The construction and arrangement of the parts of the stop-motion illustrated in Figs. 9 and 10 are the same as above described with reference to Figs. 6 and 7, with the following exceptions: The housing b^9 is dispensed with and the collar b^8 is continued downward between the shaft b^2 and two-part clutch and is connected with the gasket b^{15} by means of elongated pins i^6. The gasket is provided with an extension i^7, that supports the under side of the pulley b^{12}, so that the downward motion of the lower member of the two-part clutch is transmitted to the grooved sleeve b^{11}, it being understood that the pins i^6 are long enough to permit the gasket b^{15} to be shifted downward far enough to operate the lever and parts connected therewith without becoming disengaged from the collar b^8. Moreover, the levers j are turned around and the thread-carriers b^7 are dispensed with, the threads being led to the machine through suitable eyes formed in the guides b^{10}, through the eyes formed in the levers j, and then through suitable eyes formed in the collar b^8 and gasket b^{15}. The outer extremity of the collar b^8 is upwardly flanged, so as to form ways for the cam-carrier k, and the upper edge of this flange is provided with slots in which the extremities of the levers j work, so that the extremities of these levers are prevented from being shifted laterally and are allowed a range of vertical movement. It will be understood that in the modified form of stop-motion the swivel-eyes j' may be dispensed with and rigid eyes j^5, as illustrated in Fig. 11, may be employed in lieu thereof.

In Fig. 11 is also illustrated a modified form of adjustable counter-weight j^7, that is attached at one extremity thereof to the lever j by means of a set-screw j^8, so that it can be adjusted toward or away from the lever, as shown in dotted lines, and then clamped to place.

Figs. 12, 13, and 14 illustrate thread-cutters adapted to be attached to the thread-rack c^2, Fig. 1, by means of set-screws d', and are provided, respectively, with a thread-gage d^2 and counterbalanced thread-lever d^3, having a hook or eye d^4 for the passage of the thread. In Fig. 12 the cutter is provided with a plate d^5, having a slot d^6 formed therein for the passage of the thread, and with a wedge-shaped blade d^7, attached to or formed integral with the counterbalanced lever d^3 and extending below the hook or eye d^4 thereof, so that whenever a knot or enlarged portion of the thread contacts with and is caught by the thread-gage d^2, or whenever the thread does not feed properly from the bobbin, the thread is drawn tight by the machine and shifts the lever d^3 and blade d^7 downward, so that the latter cuts or severs the thread between the slot d^6 and the eye of the lever d^3. In Figs. 13 and 14 the lever d^3 is provided with a depending lug d^8, which engages a slot d^9, formed in the shank d^{10} of a pivotally-supported circular blade d^{11}, so that when the thread, which is passed over the stud d^{12}, that supports the levers d^3, is drawn tight, it causes the lever d^3 to be drawn downward, as before, and this downward motion of the lever causes the blade d^{11} to be rotated into contact with the thread, whereby the latter is severed just above the plane of the thread-gage.

The construction and arrangement of parts of the modified form of cutter illustrated in Fig. 15 are as above described with reference to Figs. 12, 13, and 14, with the following exceptions: The wedge-shaped blade d^{13} is fixed and the eye d^4 of the lever d^3 normally supports the thread above the same, so that when the thread is drawn tight the lever d^3 is rotated and permits the bight of the thread to come into contact with and be drawn along the edge of the blade, so as to be severed thereby.

The mode of operation of the hereinabove-described stop-motion mechanism is as follows: The threads are led from the bobbins upward through the eyes of the counterbalanced levers d^3, and then to the machine, and the counterbalancing devices on the levers d^3 are so adjusted as that the levers d^3 prevent the thread from contacting with the blades when the tension of the thread is normal or does not exceed a predetermined amount. However, whenever the tension of any one of the threads is increased for any cause—for example, by the failure of the bobbin to unwind properly or by the detention of one of the threads by an enlargement thereof being caught between the jaws of one of the thread-gages d^2—the counterbalanced lever d^3 is shifted and causes one of the blades to cut or sever the tight thread. After passing through the cutters the threads are led past the spreaders b^{10} through the eyes of the yarn-controlled levers j and past the two-part clutch to the thread-carrier b^7 of the machine, and the counter-weights j' are so adjusted as that the levers j are held out of engagement with the two-part clutch when the threads are under normal tension or are not unduly slack. However, when the threads are slackened, the levers j are permitted to engage the two-part clutch, and thereby cause the machine to be stopped, so that whenever a thread is cut or severed by the cutters d or is otherwise broken it becomes slack and actuates the stop-motion mechanism, which in turn causes the machine to be thrown out of gear.

It will be obvious to those skilled in the art to which my invention relates that the cutters and stop-motion mechanism may be employed separately and in connection with various machines other than knitting-machines, and that modifications may be made in the details of the construction and arrangement of the parts

without departing from the spirit of the invention, and hence I do not limit myself to the exact construction and arrangement herein described and illustrated in the accompanying drawings; but,

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A stop-motion for knitting-machines, consisting of a sectional clutch having inclined contact surfaces, one member being positively rotated with the machine and the other member frictionally driven by said positively-rotated member, devices contacting with the threads and adapted to check said frictionally-driven member so as to permit the inclined contact-surfaces to slide on one another to shift one of said members, and means connected with one of said members for throwing the machine into and out of gear, substantially as and for the purposes set forth.

2. A stop-motion for knitting-machines, consisting of a two-part sectional clutch whereof each member has an inclined contact-surface, one member being rotated with the machine and permitted a range of axial motion and the other member rotatable and normally in contact with the driven member, projections on said rotatable member, counterbalanced levers controlled by threads and adapted to engage said projections, and power-applying devices controlled by the axial motion of said positively-driven member, substantially as and for the purposes set forth.

3. A stop-motion for knitting-machines, consisting of a sectional clutch whereof each member has a serrated contact-surface, one member rotated with the machine and afforded a range of axial motion and the other member rotatable and held against end-play, elastic means for maintaining said members normally in contact with each other, projections on said rotatable member, levers controlled by threads and supported by a fixed carrier and adapted to engage said projections, and means for connecting in operation said rotating member and power-shifting appliances, substantially as and for the purposes set forth.

4. The combination, in a stop-motion, of a rotatable member, means for frictionally rotating the same, projections on said member, yarn-controlled levers for engaging said projections, cams for lifting said yarn-controlled levers, and means for shifting said cams, substantially as and for the purposes set forth.

5. The combination, in a stop-motion, of counterbalanced levers controlled by threads, cams for returning said levers to their normal positions, and means for shifting said cams, substantially as and for the purposes set forth.

6. The combination, in a stop-motion, of a rotating member provided with projections, balanced levers controlled by threads and adapted to engage said projections, a cam-carrier, cams attached thereto and adapted to shift said levers, a power-shifting appliance, and means connected with said power-shifting appliance and cam-carrier, the construction being such that when the power appliance is shifted to start the machine the levers are automatically returned to their normal positions, substantially as and for the purposes set forth.

7. The combination, in a stop-motion, of a central shaft, a collar keyed thereto, a housing attached to said collar, a two-part rotatable clutch whereof both members are located in said housing and provided with inclined contact-surfaces and one member maintained against end-play by a collar and the other permitted a range of axial motion, a spring contacting with said axially-movable member for retaining the two members normally in contact with each other, a pulley on said axially-movable member, projections on said rotatable member, means for rotating said pulley, levers adapted to engage said projections and extending through slots in said housing, thread-guides on said housing, spreaders on said shaft, and means engaging said axially-movable member and adapted to actuate a power-shifting appliance, substantially as and for the purposes set forth.

8. The combination, in a stop-motion, of a central shaft, a housing supported thereby, a two-part rotatable clutch whereof both members are provided with serrated contact-surfaces, one member being supported against end-play and the other permitted a range of axial motion, means for rotating said members, the one positively and the other frictionally, projections on said rotatable member, levers working in slots in said housing and adapted to engage said projections, thread-guides attached to said housing, and means engaging said axially-movable member and adapted to actuate a power-shifting appliance, substantially as and for the purposes set forth.

9. The combination, in a stop-motion, of a shaft, a collar having a flange, a housing attached to said collar, a two-part rotatable clutch whereof both members are provided with inclined contact-surfaces normally in contact with one another, one member supported against end-play and the other permitted a range of axial motion, means for rotating said members, thread-controlled counterbalanced levers attached to said flange and adapted to engage the first-mentioned member, a cam-carrier supported by said flange, cams attached thereto and adapted to engage said levers, thread-guides, means engaging said axially-movable member and adapted to actuate power-shifting appliances, and connections engaging said cam-carrier and power-shifting appliances, substantially as and for the purposes set forth.

10. The combination, in a stop-motion, of a shaft, a housing supported by said shaft, a sectional clutch whereof both members are provided with inclined contact-surfaces normally in contact with one another, means for

rotating one of said members and thread-controlled counterbalanced levers attached to a flange and adapted to engage the other of said members, a cam-carrier and cams for engaging said levers, means engaging said positively-rotated member and adapted to actuate power-shifting appliances, and connections engaging said cam-carrier and power-shifting appliances, substantially as and for the purposes set forth.

11. A stop-motion for knitting-machines, comprising a driving-shaft, a device for connecting and disconnecting the machine therewith, a two-part sliding and friction clutch whereof one member driven by said connecting device is afforded a range of axial motion and the other member is normally driven by frictional contact therewith, yarn-controlled levers for engaging said frictionally-driven member, a pivotally-supported lever adapted to be actuated by the axial motion of said member for shifting said connecting device to disconnect the machine and main shaft, cams for shifting said levers out of engagement with the frictionally-driven slotted member, and link connections attached to said connecting device, and cams for shifting the yarn-controlled levers out of engagement when the machine is started, substantially as set forth.

12. A stop-motion for knitting-machines, comprising a driving-shaft, a device for connecting and disconnecting the machine therewith, a two-part sliding and friction clutch whereof one member is driven by said connecting device and is afforded a range of axial motion and the other member is normally driven by frictional contact therewith, yarn-controlled levers for engaging said frictionally-driven members, a pivotally-supported lever having one extremity engaging a circumferential projection on said axially-movable member, a chain or rod attached to said lever and connecting device, cams for shifting said levers out of engagement with the frictionally-driven members, and links attached to said connecting device by a slotted connection and to said cams, substantially as and for the purposes set forth.

13. The combination, with a knitting-machine having power-shifting appliances, of a shaft attached to the dial-plate, a frame attached to the bed-plate, stop-motion mechanism comprising a two-part friction and sliding clutch, cams, and thread-levers supported by said shaft, means for rotating one of said members with the machine, and two sets of levers supported by said frame, one of said sets of levers connected with said power-shifting appliance and with a clutch for throwing the machine out of gear, and the other set of levers connected with said power-shifting appliance and cams for automatically readjusting said stop-motion mechanism, substantially as and for the purposes set forth.

14. The combination, with a knitting-machine having a main shaft provided with fast and loose pulleys, of a belt for actuating the same, a belt-shifter, a shaft and frame supported by the machine, rotating stop-motion mechanism comprising a two-part sliding and friction clutch, counterbalanced thread-levers, and cams supported by said shaft, a band passing over pulleys on said frame and engaging said fast pulley and one member of said clutch, and two sets of levers supported by said frame, whereof one set engages said shipper and positively-driven member and the other set engages said cams and shipper, substantially as and for the purposes set forth.

15. The combination, with a knitting-machine having a main shaft and power-shifting appliances therefor, a stop-motion comprising a two-part sliding and friction clutch, counterbalanced levers normally retained out of range of said clutch by the threads, and cams for readjusting said levers, means engaging said power appliance and one of said members for rotating the latter, and two sets of levers, whereof one engages said shifting appliances and the clutch and the other said cams and shifting appliance, substantially as and for the purposes set forth.

16. The combination of a knitting-machine having power-shifting appliances, a stop-motion mechanism, a frame adapted to be attached to the bed-plate of the machine, and two sets of slotted adjustable levers attached to said frame by adjustable connections to permit of the application of the frame and stop-motion to machines of different sizes or types, substantially as described.

17. The combination, with a knitting-machine having a dial-plate and thread-carrier, of a two-part coupling whereof one part is attached to the center shaft of the dial-plate and the other part to a stop-motion having thread-levers, the construction being such that said thread carriers and levers may be retained in line with each other when the dial-plate is adjusted, substantially as and for the purposes set forth.

18. The combination, with a knitting-machine having a dial-plate and thread-carriers, of a two-part coupling whereof both parts have toothed and interlocking contact-surfaces, one part being keyed to a shaft carrying stop-motion mechanism having thread-levers and the other attached to the dial-plate and provided with a set-screw for engaging the shaft, the construction being such that such thread carriers and levers may be retained in line with each other, substantially as and for the purposes set forth.

19. The combination, with a knitting-machine having a dial-plate and thread-carrier, of a two-part coupling whereof both parts have toothed and interlocking contact-surfaces, one part being keyed to a shaft and the other attached to the dial-plate and provided with a hand-wheel and with a set-screw for engaging said shaft, and stop-motion mechanism supported by said shaft and provided with thread-guides, the construction being

such that said thread carriers and levers may be retained in line with each other, substantially as and for the purposes set forth.

20. The combination, in a stop-motion for knitting-machines, of a rotatable member, means for rotating said member, and thread-levers provided with adjustable counter-weights and adapted to engage and check said member, substantially as and for the purposes set forth.

21. The combination, in a stop-motion for knitting-machines, of a rotatable member, means for rotating said member, and thread-levers provided with adjusting-screws and adapted to engage and check said member, substantially as and for the purposes set set forth.

22. The combination, in a stop-motion mechanism for knitting-machines, of a slotted housing provided with thread-guides, thread-levers for controlling said stop-motion mechanism and extending through said slots, and swiveled eyes attached to said levers, the construction being such that said levers may be inserted through the slots and the swivel-eyes turned into position, substantially as and for the purposes set forth.

23. In a knitting-machine, a yarn-cutter consisting of a thread-gage, a blade, and a counterbalanced lever provided with an eye and adapted to normally prevent contact of the thread and blade, substantially as and for the purposes set forth.

24. In a knitting-machine, a yarn-cutter consisting of a thread-gage, a slotted plate, and a counterbalanced lever provided with a blade and eye, substantially as and for the purposes set forth.

25. In a knitting-machine, a yarn-cutter consisting of a thread-gage, a slotted plate, and a counterbalanced lever provided with a wedge-shaped blade and with an eye located above the cutting-edge of said blade, substantially as and for the purposes set forth.

26. In a knitting-machine, a yarn-cutter consisting of a thread-gage, a pivotally-supported lever provided with a wedge-shaped blade and with a thread-hook located above the cutting-edge of said blade, and an adjustable counter-weight on said lever, substantially as and for the purposes set forth.

27. The combination of a knitting-machine, yarn-cutters comprising a thread-gage, a blade, and a counterbalanced lever, a stop-motion comprising a two-part frictional and sliding clutch, and counterweighted thread-levers, and means actuated by said clutch for shifting the power from the machine, substantially as and for the purposes set forth.

28. The combination of a knitting-machine, yarn-cutters, a stop-motion mechanism comprising a two-part frictional and sliding clutch, and thread-levers, and means, actuated by said clutch for shifting the power from the machine, substantially as and for the purposes set forth.

29. The combination of a knitting-machine, a frame attached thereto, a bobbin-shelf and thread-rack on said frame, thread-cutters on said rack, a stop-motion mechanism comprising a two-part sliding and friction clutch, and thread-controlled levers, and means actuated by said clutch for shifting the power from the machine, substantially as and for the purposes set forth.

30. The combination of a knitting-machine having power-shifting appliances, a stop-motion mechanism, a frame adapted to be attached to the bed-plate of the machine and provided with a two-part adjustable bracket, and adjustable levers pivotally attached, respectively, to said frame and bracket, whereby the parts of the stop-motion mechanism are returned to their normal positions, the construction being such that the frame and levers may be applied to machines of different sizes, types, or kinds, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

DAVID C. BELLIS.

Witnesses:
RICHARD C. MAXWELL,
THOMAS M. SMITH.