

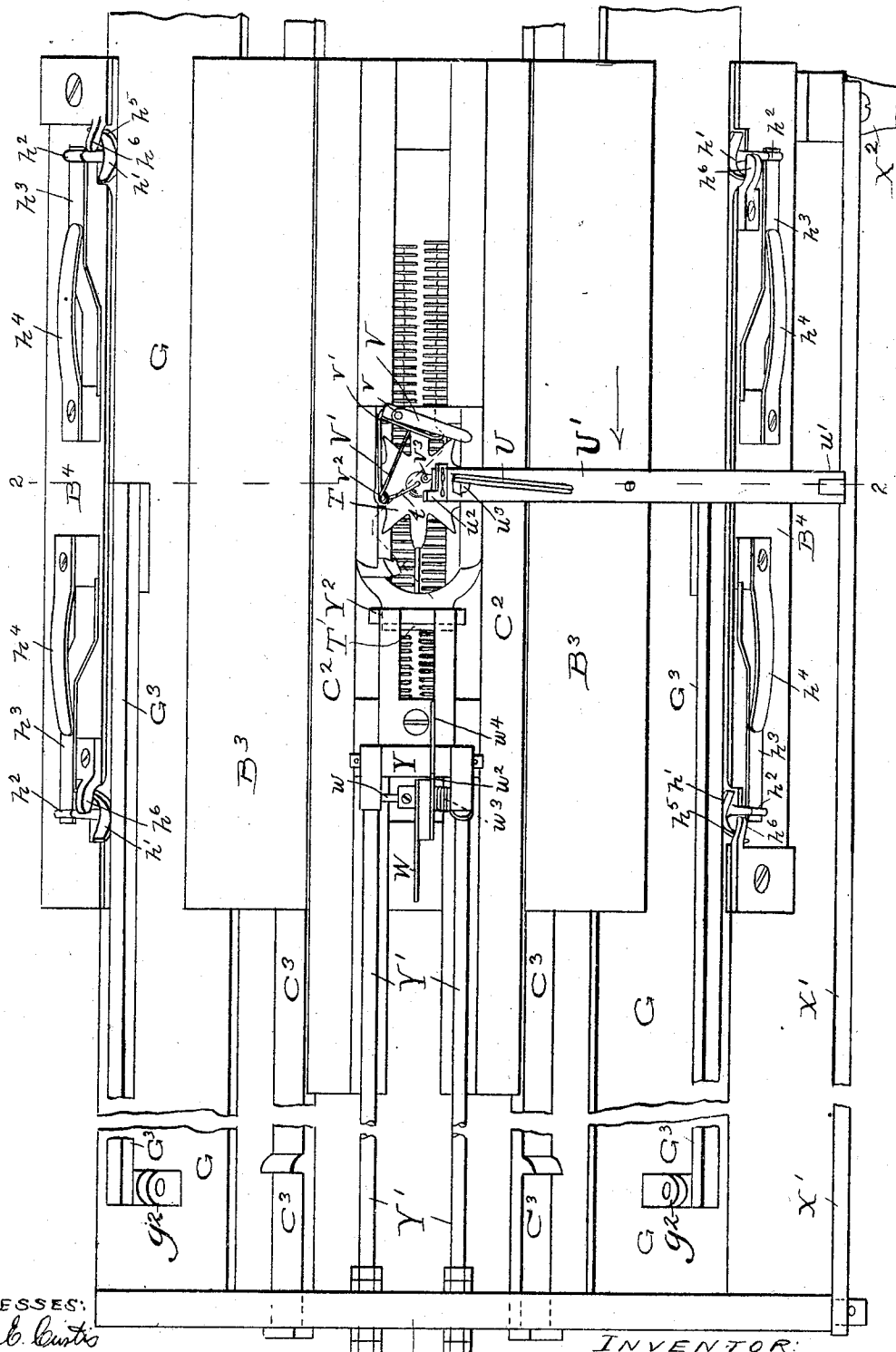
No. 796,699

PATENTED AUG. 8, 1905.

W. W. BURSON.
KNITTING MACHINE.
APPLICATION FILED JUNE 7, 1897.

3 SHEETS—SHEET 1.

FIG. I.



WITNESSES:

Lew. C. Curtis

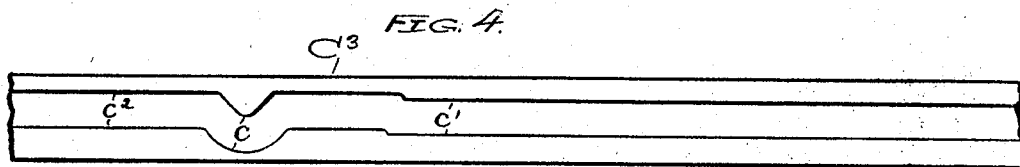
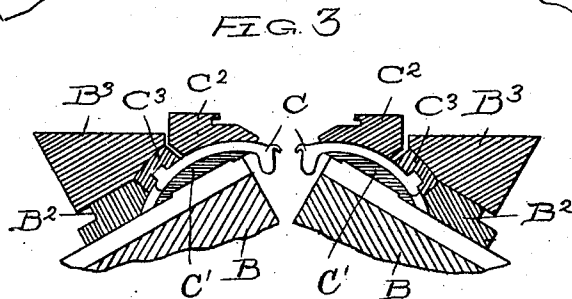
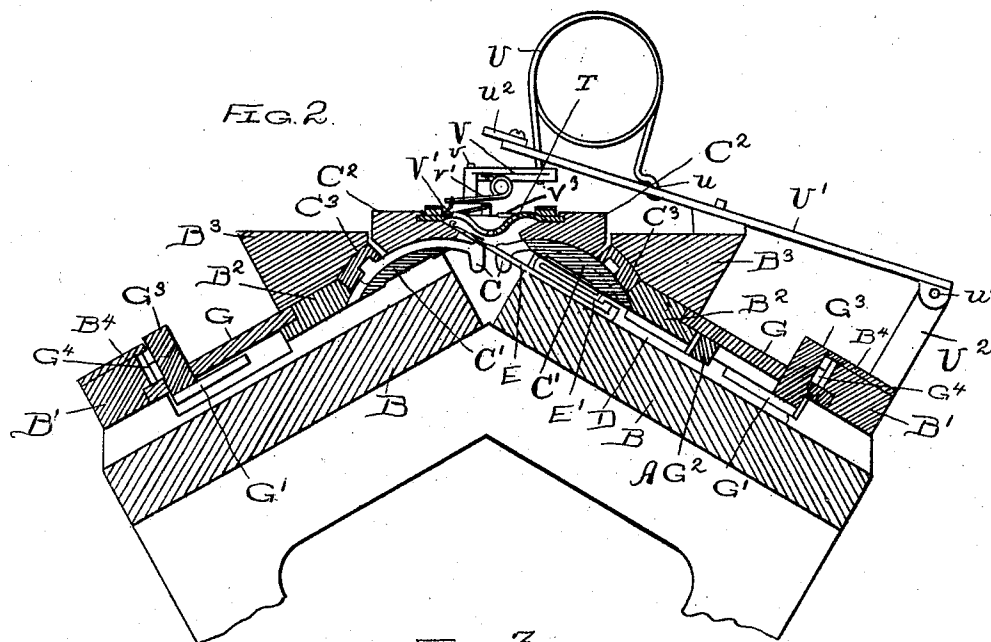
Edw. S. Evans

INVENTOR:

X William Worth Burson.

W. W. BURSON.
KNITTING MACHINE.
APPLICATION FILED JUNE 7, 1897.

3 SHEETS—SHEET 2.



WITNESSES:

Geo. E. Curtis.

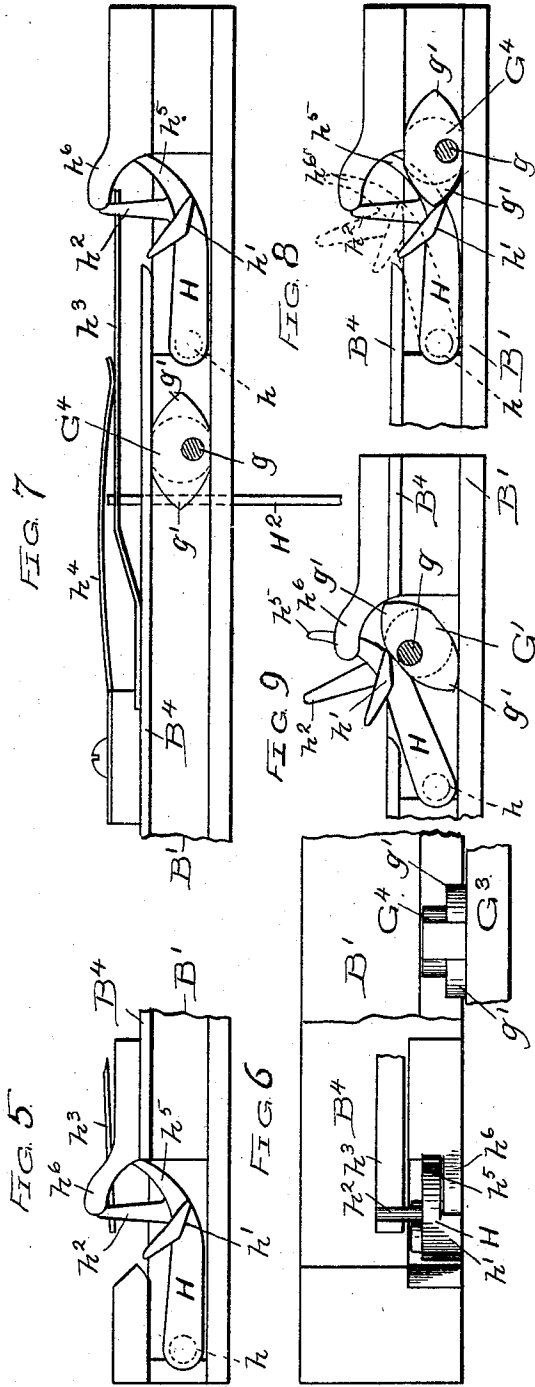
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INVENTOR:

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W. W. BURSON.
KNITTING MACHINE.
APPLICATION FILED JUNE 7, 1897.

3 SHEETS—SHEET 3.



WITNESSES:
Geo. E. Lewis
Edw. S. Evans

INVENTOR:
William North Burson.

UNITED STATES PATENT OFFICE.

WILLIAM WORTH BURSON, OF CHICAGO, ILLINOIS.

KNITTING-MACHINE.

No. 796,699.

Specification of Letters Patent.

Patented Aug. 8, 1905.

Application filed June 7, 1897. Serial No. 639,677.

To all whom it may concern:

Be it known that I, WILLIAM WORTH BURSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Knitting-Machines, of which the following is a specification.

My invention relates to improvements in knitting-machines of the class in which there are employed in a given machine two straight rows of needles, such machines being known as "parallel-row" machines.

The objects of my invention are in general to control the action of the needle-operating cams.

An embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a top view of certain portions of a parallel-row knitting-machine containing the said embodiment. Fig. 2 is a view in vertical section on the plane indicated by the dotted line 2 2, Fig. 1. Fig. 3 shows a view of certain of the parts in section on the same line, the presser-hooks being somewhat farther apart than in Fig. 2. Fig. 4 shows a portion of the length of the presser-hook cam-bar. Fig. 5 shows in elevation certain of the parts adjacent one end of the machine, comprising one of the switches by which the needle-operating cams are placed in and out of position for engaging with the needles and adjacent parts. Fig. 6 shows the parts of Fig. 5 in plan and in connection therewith the eccentric-block G^4 , pertaining to the corresponding needle-operating cam, and portion of the carrier-arm G^3 of said cam, the plate B^4 being removed. Fig. 7 shows in elevation the switch and adjacent parts, which are employed at the opposite end of the same side of the machine, with block G^4 represented as occupying a position slightly to the left of the said switch. Fig. 8 shows the block G^4 at the right-hand side of the switch and as having just engaged the point of the switch in the movement of the needle-operating cams from right to left. In dotted lines this figure shows the inoperative position into which the switch may be raised when it is desired to prevent engagement of the block and switch with each other. Fig. 9 shows the same parts as Fig. 8, but represents them in the position which they occupy when block G^4 has been

almost completely turned by the engagement of the switch H therewith. Fig. 10 is a detail view showing one of the levers h^3 and certain parts connected therewith.

Similar letters refer to similar parts throughout the several views.

It is not considered necessary to illustrate more of the knitting mechanism than is required to show my improvement. The knitting mechanism in connection with which the invention is employed may correspond in the main with that shown and described in my application filed March 13, 1886, Serial No. 195,111, on which latter United States Letters Patent No. 616,600 were granted December 27, 1898.

At A is represented portion of a machine-frame having its upper surfaces inclined at an angle of about thirty degrees to each other. On these inclined surfaces are fastened the needle-beds B B. To the needle-bed at each side of the machine are fastened the guide-bars B^1 and B^2 for the corresponding needle-operating cam-slide and also the presser-hook segment C^1 of such side. The bar B^3 , which is fastened to the top of the bar B^2 , serves to hold the cam-slide G and presser-hook cam-bar C^3 down in place. The plate B^4 projects inward beyond the inner edge of the bar B^1 to form an upper guide for the block G^4 , to which reference will presently be made. The bar C^2 , which is fastened on the segment C^1 at each side of the machine, serves to hold the presser-hooks C down in place and also as a support for one side of the yarn-carrier T, Fig. 2, in the movements of the latter.

The needle-projecting cam G^1 , Fig. 2, at each side of the machine is fastened to the carrier-bar G^3 , (see more particularly Figs. 1 and 2,) which latter is hinged upon cam-slide G at g^2 , Fig. 1. The said cam G^1 , thus mounted or supported in connection with the cam-slide, is adapted to be shifted or adjusted in a direction perpendicular to the plane of the needle-bed into and out of position for engagement with the bits or heels of the jacks D, which are employed in connection with the needles E. This shift or adjustment of the said cam G^1 is effected in the manner which presently will be explained by means of the eccentric block G^4 , which is pivoted on the stud g , with which the cam-bar G^3 is provided. The needle-re-

tracting cam G^2 , Fig. 2, is fastened to the cam-slide G in any approved manner. The jack D , needle E , and filler-piece E' , Fig. 2, are combined and operate in manner which will readily be understood.

For the purpose of automatically shifting the needle-projecting cams G' G' vertically, so as to secure the desired results in the knitting, I employ at each end of each of the needle-beds two switches H H , as shown in Fig. 1. Figs. 5 and 7 together show the two switches which are employed upon one side of the machine at opposite ends of the corresponding needle-bed.

Referring more particularly to Figs. 5 to 9, Sheet 3, each switch H is pivoted at h upon the inner edge of a bar B' and has the inclined projection h' adjacent its free or operating end. The free extremity of the switch-arm is upwardly curved, as at h^5 . The switch-arm is furnished with the upright arm or extension h^2 , which last is engaged by the movable controlling arm or lever h^3 . The said arm or lever h^3 is constituted in the present instance of a strip which is attached by one end thereof to the plate B^4 and at its other or free end enters a horizontal notch in the arm or extension h^2 . Upon the plate B^4 adjacent each switch is affixed the guard h^6 , against the inner side of which the proximate side of the curved part h^5 of the switch takes lateral bearing, thus serving to relieve the pivot h from part of the strain which the operation of the switch tends to transmit to said pivot. The spring h^4 , Figs. 1 and 7, operates with a tendency to hold the controlling arm or lever h^3 depressed and when permitted to do so places and keeps the switch in its operative position. (Shown by full lines in Figs. 5, 7, and 8.) The controlling arm or lever h^3 is engaged and actuated by means of the push-bar H^2 , Figs. 7 and 10, which latter at its upper end is notched to engage with the arm or lever h^3 . When said push-bar is moved upwardly, which may be effected either by hand or the action of suitable pattern devices, it raises the said arm or lever h^3 and thereby lifts switch H out of the said operative position into the inoperative position in which it is represented in dotted lines in Fig. 8. Each carrier-arm G^3 has mounted thereon upon a pivot-pin g , Figs. 7, 8, and 9, an eccentric block G^4 . The latter consists, substantially, of a cylindrical part or body, which preferably is slightly flattened on diametrically opposite portions thereof and is furnished with a flange that is flattened at the opposite sides thereof correspondingly with the said cylindrical part or body, the said flange being somewhat elongated and formed with pointed ends g' g' . The hole which is formed in block G^4 for the reception of the stud g , which connects the same pivotally with cam-bar G^3 , is eccentrically located with

relation to the cylindrical portion or body of the said block. The said block thus eccentrically pivoted to the hinged carrier-arm G^3 , which holds the projecting cam G' , (see Figs. 5 to 9,) moves along the inner edge of the guide-piece B' beneath the projecting edge portion of plate B^4 and between such edge portion and a lower guide for the block, which lower guide may be constituted by the upper surface of the adjacent needle-bed or otherwise, if preferred. It will be readily understood that each half-turn of the block will raise or lower the needle-projecting cam into inoperative position above the bits or heels of the jacks or into position to engage such heels or bits, and thus cause the needles to be actuated, as the case may be.

Referring to Figs. 5 and 7, it will be noticed that in Fig. 7, the block G^4 being in position to lower the needle-projecting cam G' into its lowest position, the said cam will project the needles in the movement of the cam along the corresponding needle-bed in the direction from right to left. When the leading end of block G^4 , in the movement of the cam toward the left, reaches the point h' of switch H , Fig. 5, at the left-hand end of the needle-bed, it will engage therewith, as in Fig. 8, and as the movement toward the left continues the said leading end will be tipped upward and the block turned end for end, the turning movement being indicated in Fig. 9. By the new position thus given to block G^4 the pivot g will be caused to occupy a higher position, and thereby the needle-projecting cam G' will be raised into inoperative position with relation to the heels or bits of the jacks. On the return movement of the knitting-cams—that is to say, in the direction from left to right—the block G^4 will pass under the inclined piece h' of each switch H , thereby lifting the respective switches out of the way, and will not be turned. In the succeeding movement of the knitting-cams from right to left the right-hand switch will act to communicate a half-revolution to the block G^4 , restoring it to its relative position in Fig. 9, lowering the needle-projecting cam into operative position, and at the conclusion of such movement the left-hand switch will repeat its action represented by Figs. 10 and 11, raising thereby the needle-projecting cam into inoperative position. While this action proceeds at one side of the machine a corresponding action will be proceeding upon the other. For tubular knitting it will be understood that when the knitting-cam at one side is depressed into operative position for the stroke in one direction the knitting-cam at the opposite side of the machine is raised into inoperative position, and vice versa for the stroke in the opposite direction. It therefore will be clear that tubular work may be knit indefinitely with-

out any change of the switches if the blocks G^4 at the opposite sides of the machine are started properly. Changes from tubular knitting to flat knitting, and vice versa, may be occasioned as desired by causing the respective switches to be moved into and out of operative position at the required times, either by hand or by pattern connections.

Motion is given to the operating cam-bars $G G$ by the crank X^2 , Fig. 1, through pitman X' , the latter being connected at one end thereof to the crank-pin and at the other to the cross-bar X , which is fastened to the ends of the said cam-bars.

Rods $Y' Y'$, which are fastened by their outer extremities to the cross-bar X , have connected with the inner extremities thereof the yarn-carrier-actuating block Y , Figs. 1 and 5, by means of which the yarn-carrier T is pushed across the needles in the movement of the cam-bars in one direction through the engagement of the end of such block with an upturned lug or flange T' of the yarn-carrier. The depending lip of the draft-piece Y^2 upon block Y serves by its engagement with said lip or lug of the yarn-carrier to draw the yarn-carrier along as the cam-bars return in the opposite direction. The space between the end of the push-block Y and the depending lip of the draft-piece Y^2 is sufficient to provide for lost motion or play in the transmission of movement from block Y to the yarn-carrier. This permits the carrier T to fall back at each stroke of the knitting-cams into proper adjustment with the said cams, which are relatively fixed to the underside of the cam-bars $G G$. The presser-hook cam-bars $C^3 C^3$ are also operated by the cross-bar X through the engagement of the latter with lugs or bosses $c^{31} c^{31}$, with which the cam-bars are furnished, as shown at the left in Fig. 1. The distance between the said lugs or bosses is sufficient to permit a fall-back adjustment of the cam-bars C with relation to the needle-actuating cams at each return movement of the cams, &c., Fig. 1.

I do not wish to confine myself to the exact construction hereinbefore described, inasmuch as various changes may be made without departing from the scope of my invention.

The features of the yarn-carrier devices herein shown and in part described are not claimed herein, but are made the subject of claim in my divisional application for United States Letters Patent filed February 4, 1905, Serial No. 244,077.

I claim as my invention—

1. The combination, in a knitting-machine, of a movable part, a revolving block pivoted eccentrically on said movable part, a needle-actuating cam carried by said movable part and adapted to be moved therewith in a direction vertical to the plane of the needles, and a movable trip adapted to turn said block

end for end, whereby the said cam shall be raised above or lowered to the operative plane of the needles by said block as desired.

2. The combination, in a knitting-machine, of a movable part, a revolving block pivoted eccentrically on said movable part, a needle-actuating cam carried by said movable part and adapted to be moved therewith in a direction vertical to the plane of the needles, a movable trip adapted to turn said block end for end, whereby the said cam shall be raised above or lowered to the operative plane of the needles by said blocks as desired, and means for operating the said trip to place it in and out of position to coact with the said block, substantially as set forth.

3. The combination, in a knitting-machine, of a hinged part, a cam carried thereby, a revolving block pivoted eccentrically to said hinged part, a movable trip adapted to turn said block end for end, whereby the cam carried by said hinged part shall be moved vertically and thereby rendered operative or inoperative in connection with the needles, and a guideway for the block, with means for operating the several parts, substantially as described.

4. In a knitting-machine, in combination, a needle-actuating cam, a movable support therefor, means to traverse the said support and cam, a revoluble block pivoted eccentrically to the said support, and a movable trip having an inclined engaging portion adapted to turn the block end for end when the latter is being carried in one direction and to permit the block to pass in the other direction without being turned.

5. In a knitting-machine, in combination, a needle-actuating cam, a movable support therefor, means to traverse the said support and cam, a revoluble block pivoted eccentrically to the said support, a movable trip adapted to engage said block and turn the same, a movable controller for said trip, and means to operate the said controller to place the trip in and out of operation.

6. The combination of the needles, the cam-bar, and the needle-operating cam, with a revolving block, G^4 , pivoted eccentrically, and a switch H , adapted to turn the block end for end, substantially as described.

7. The combination of a revolving block, G^4 , pivoted eccentrically upon the cam-bar, G^3 , bearing a knitting-cam, and a switch H bearing a trip part with plates B' and B^4 forming a grooved passage-way for the said block, operating substantially as set forth.

8. The combination of a revolving block, G^4 , pivoted eccentrically upon the cam-bar, G^3 , bearing a knitting-cam, a switch H bearing the inclined trip H' , and means for operating the said cam-bar and switch, whereby the said block shall be turned when moving in one di-

rection and shall pass by without being turned when moving in the other direction, substantially as set forth.

9. The combination of a revolving block, G^4 , pivoted eccentrically upon the cam-bar, G^3 , bearing a needle-operating cam, and a switch H bearing a trip to engage said revolving block, with a lever L^3 connecting with said

switch and adapted to control its position, whereby the said block may be turned end for end while passing said switch or pass it without turning, substantially as set forth.

WILLIAM WORTH BURSON.

Witnesses:

H. D. EASTMAN,

H. B. WHEELER.