

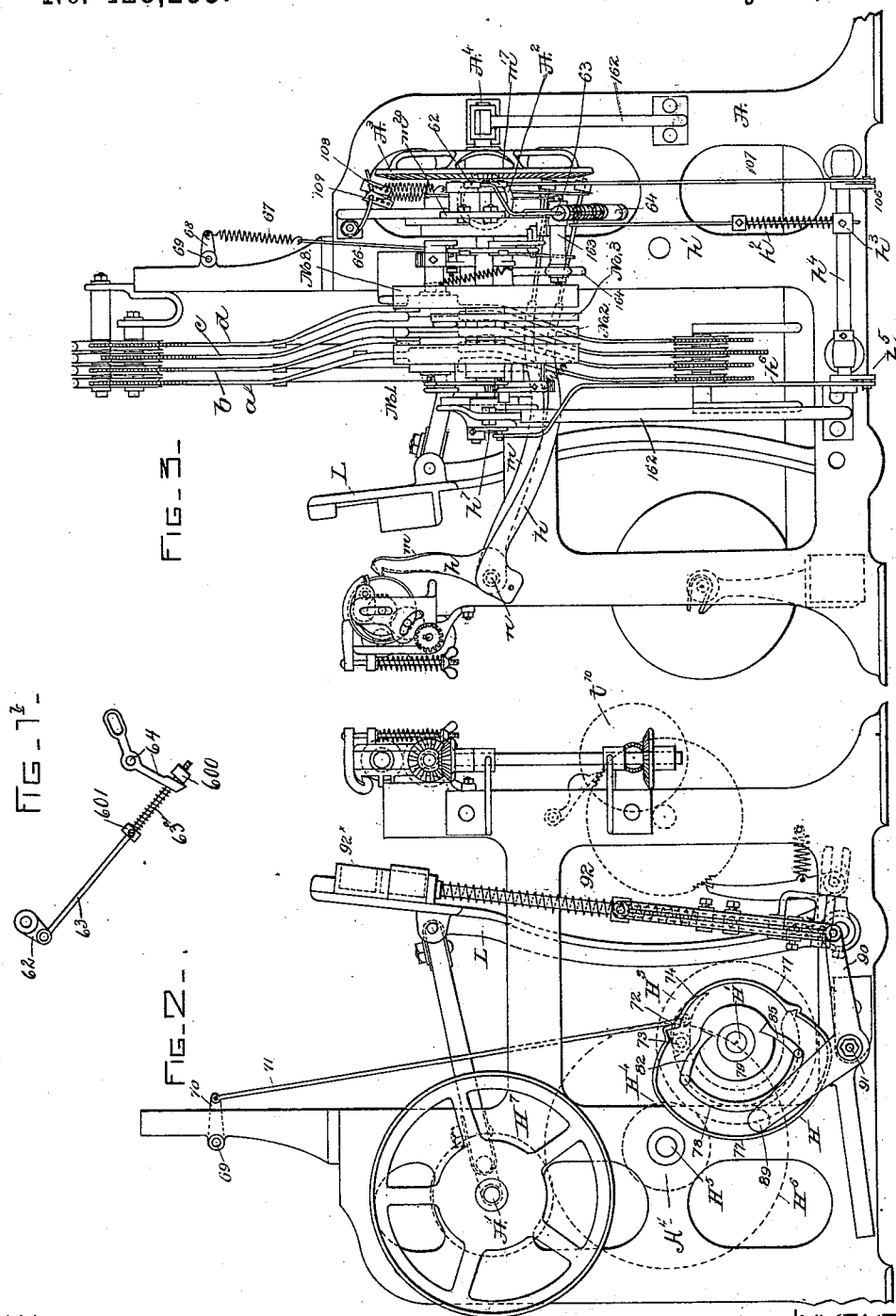
(No Model.)

3 Sheets—Sheet 2.

J. T. MEATS.
LOOM FOR WEAVING POCKETS.

No. 428,253.

Patented May 20, 1890.



WITNESSES

Howard F. Eaton
Fred L. Emery.

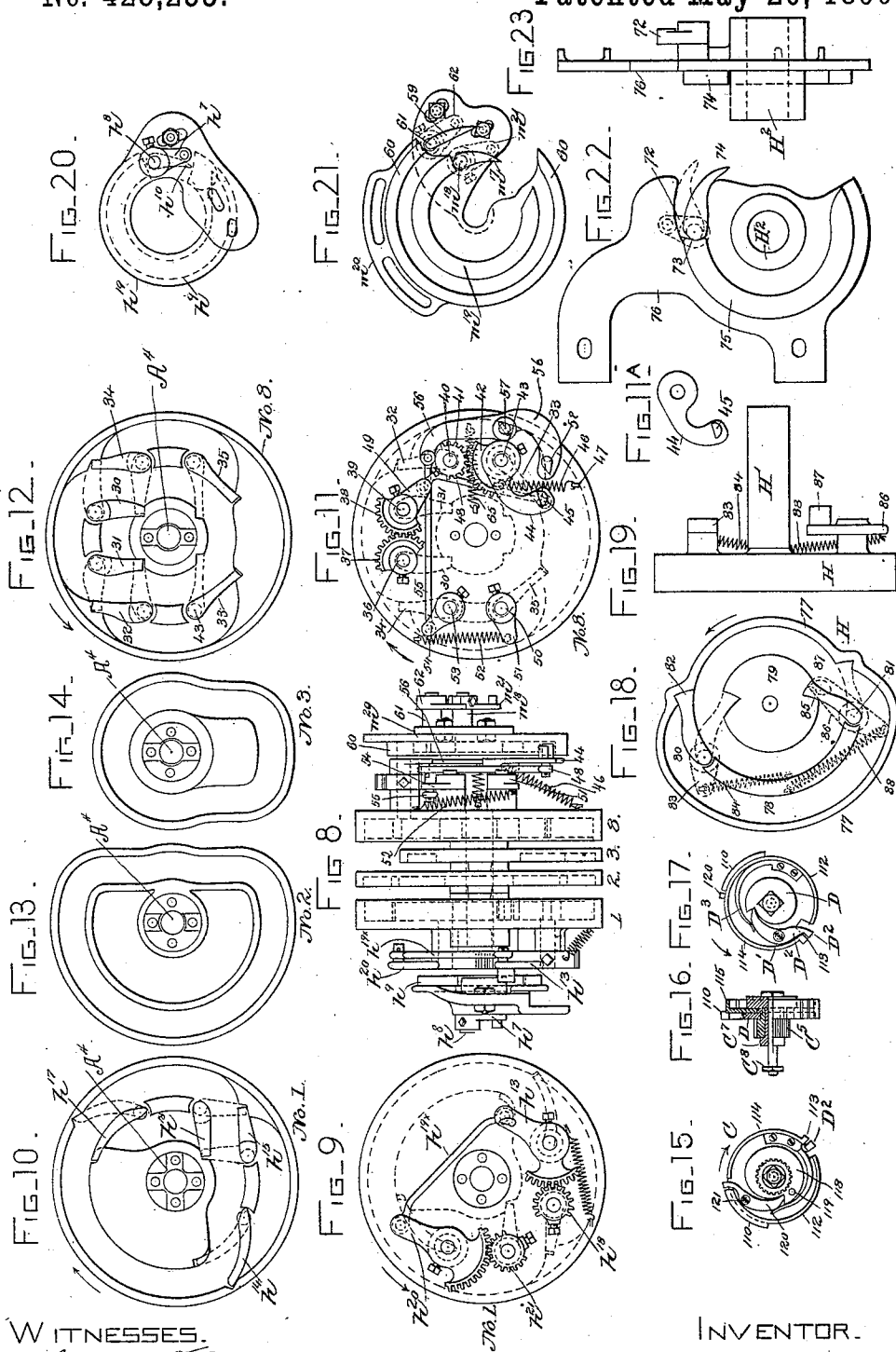
INVENTOR

John T. Meats.
By Crosby & Mayory attys

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WITNESSES.

Howard T. Carter,
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INVENTOR.

John T. Meats,
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UNITED STATES PATENT OFFICE.

JOHN T. MEATS, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO THE MASON MACHINE WORKS, OF SAME PLACE.

LOOM FOR WEAVING POCKETS.

SPECIFICATION forming part of Letters Patent No. 428,253, dated May 20, 1890.

Application filed December 8, 1887. Serial No. 257,291. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. MEATS, of Taunton, county of Bristol, and State of Massachusetts, have invented an Improvement in Looms for Weaving Pockets, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention has for its object the production of a power-loom for weaving pockets, the present invention being an improvement on that described in my application Serial No. 231,097, filed March 16, 1887, and patented as
15 No. 379,484. The loom described in the patent referred to is more especially designed to weave pockets open at one side; but in my present invention the loom has been somewhat altered in construction to enable the
20 production of pockets open at both edges, the fabric produced being made at intervals to constitute a tube, while at other parts the said fabric is woven to present two independent superimposed plies, each having two selvages,
25 the selvage portions constituting hand-holes for the pockets, the tubular portions being separated transversely by a solid woven portion to constitute a bottom for the two pockets. In the manufacture of separate pockets
30 from the web produced on the loom herein to be described the said web is cut through the solid fabric or fabric of single thickness between said tubular portions, and is also cut through the superimposed plies having the
35 selvage edges, thus making two pockets of the fabric between every two solid portions. The loom described in the patent referred to employed but one shuttle, but herein two shuttles are required, especially when the
40 double fabric or the two superimposed plies are being woven each with two selvages. To accomplish this change in the shuttle-box mechanism, so that the two shuttles may be employed when the two single plies are to be
45 woven, the loom-frame is provided with a shuttle-box cam having a set of switches by which the shape of the groove in the said cam may be changed automatically at the proper times to enable one and then the other
50 of the two shuttles to be thrown in succes-

sion, one to supply the filling for one of the plies of the single fabric and the other for the other ply, the said cam rotating once for each four rotations of the crank-shaft, the said cam rotating at the same speed as the
55 shaft containing the cams for moving the harness-levers. The shuttle-box cam, when the switches are in one position, moves the shuttle-boxes up for two picks and then down for two picks, and when the said switches are
60 in their other extreme position then the shuttle-boxes remain stationary and one and the same shuttle is thrown. The time or order of movement of the switches of the shedding-cams and of the shuttle-box cam is deter-
65 mined by a pattern-wheel, substantially such as in my said patent, but of somewhat different shape, as will be described, to thereby adapt the pattern-wheel to the movement of the switches for the peculiar fabric to be
70 made on the loom to be herein described. In order to adapt a loom of the class referred to to weave pockets open at both sides, as stated, it has been found necessary to increase the
75 number of switches in one of the harness-lever-actuating cams; and to actuate these switches in the proper time and order one of the so-called "raceways" for actuating the said switches has been provided with a double
80 course, as will be described.

My invention consists, essentially, in the combination in a loom for weaving pocket-fabric, of a series of harness-frames, a series of harness-levers to which they are connected, and a cam-shaft having a series of cams, one
85 of which has four and another six switches, combined with means, substantially as hereinafter described, by which to rotate the shaft carrying the said cams and actuate the switches of two of the said cams in such a
90 manner that a fabric may be woven having solid portions to constitute the bottoms for pockets, tubular portions to constitute the bodies for pockets, and portions presenting superimposed plies, each ply having two sel-
95 vaged edges.

Other features of my invention will be pointed out in the claims at the end of the specification.

Figure 1 is a front elevation of the chief

parts of a loom embodying my present invention, the shuttle-box at the right-hand side of the loom being broken away. Fig. 1^a shows the elbow-lever 64 detached. Fig. 1^b is a detail to be referred to; Fig. 2, a left-hand end elevation of some of the parts shown in Fig. 1; Fig. 3, a right-hand elevation of the same. Figs. 4, 5, and 6 represent, respectively, by diagrams, the correct relative positions of the cams to be referred to, they being supposed to be all on one shaft, the said diagrams showing the shapes of the cam-grooves when weaving the tubular portions of the fabric, the superimposed independent plies, and the solid fabric, the latter for the bottom of the pocket. Fig. 7 is a diagram showing the fabric produced on the loom to be described, together with sections thereof. Fig. 8 in elevation shows the series of cams employed to actuate the harness-levers and the devices instrumental in selecting and moving the switches. Figs. 9 and 10 are, respectively, an outer and inner side elevation of the cam No. 1. Figs. 11 and 12 are like elevations of the cam No. 8. Fig. 11^a shows the arm 44 detached. Figs. 13 and 14 are face views, respectively, of the cams No. 2 and No. 3. In these Figs. 9 to 14 no attempt has been made to show the relative positions of the said cams with relation to each other when on their common shaft, for the diagrams 4 to 6 have been added expressly for that purpose. Figs. 15, 16, and 17 are details showing in different positions the pattern-wheel for controlling the movements of the various switches. Figs. 18 and 19 are, respectively, an outside elevation and an edge view of the shuttle-box-actuating cam; Fig. 20, an outside view of the raceway co-operating with cam No. 1; Fig. 21, an inner side view of the double raceway co-operating with the cam No. 8; and Figs. 22 and 23 are, respectively, side and edge views of the raceway, which co-operate with the shuttle-box cam.

The frame A, the crank-shaft A', the bevel-pinion A² thereon, (shown mostly by dotted lines in Fig. 3), the bevel-gear A³, engaged by it and fast on the cam-shaft A⁴, the cams No. 1, No. 2, and No. 3 fast thereon, but shown separately in Figs. 10, 13, and 14 for moving the harness-levers *a b c*, respectively, connected to the first, second, and third harness-frames *a²¹*, the take-up roll C², gearing for actuating it, the elbow-lever *h m*, mounted on the stud *n*, the rod *h'*, connected to the said lever *h*, the rock-shaft *h⁴*, its attached arm *h⁵*, the link *h⁶*, the crank-arm *h⁷*, to which it is attached, the short rocking-stud *h⁸*, having attached to it a switch-point *h¹⁰*, (shown by dotted lines in Fig. 20,) the raceway *h⁹*, the short shaft *m¹⁸*, its attached switch-point *m¹⁷*, the arm *m²¹*, attached to the shaft *m¹⁸*, the raceway *m¹⁹*, the switch-points *h¹⁴ h¹⁵ h¹⁷ h¹⁸* on the cam No. 1, the sector-levers *h¹³ h²⁰*, the gears *h¹⁸ h²¹* engaged by them, and the link or rod *h^{19x}* also connected with cam No. 1, are all substantially the same as in the patent referred

to, so need not be herein further described in detail. The cams No. 1, 2, and 3 in the present invention operate substantially as described in the said patent. The loom presented in the patent serves for the production of a pocket fabric having portions of single thickness for the bottom of the pocket, and a tubular portion, constituting the main body of the pocket, and next beyond it a portion which would be tubular were it not that along one side it is left open. In this my present invention, however, wherein it is desired to leave the fabric open for a portion of its length at both edges or selvages, so as to constitute between the tubular portions two independent superimposed plies of fabric, as between points 100 and 101 in Fig. 7, and to do this the cam No. 8 has been provided, it taking the place of the cam No. 4. (Shown in the said patent.) This cam No. 8 has six switches, four of which, as 30, 31, 32, and 33, constitute one set, the other set being composed of the switches 34 and 35. The switches 30, 31, 32, and 33 are moved in unison; but the set composed of the switches 34 and 35 are moved independently of the other set. The switch 30 is connected to a short shaft 36, having an attached sector-gear 37, which engages a like sector-gear 38 on the short shaft 39, to which is attached the switch 31. The switch 32 is fast on a short shaft 40, having at its inner end a sector 41, which engages a sector 42 on the short shaft 43, to which is secured the switch 33. The shaft 43 has attached to it an arm 44, having a lug or projection, as 45, (see Fig. 11, and more especially Fig. 11^a,) where the said arm and projection are shown separately.

A spring 46, attached at 47 to the cam No. 8 and to a lug on the arm 44, acts to normally keep the switch 33 in the full-line position shown in Fig. 12 and dotted in Fig. 11. The arm 44 is connected by link 48 with an arm 49, attached to the shaft 39 before referred to. The switch 35 is connected to a short shaft 50, having an arm 51, which by spring 52 is connected to a stud secured to the cam-disk No. 8, the spring 52 normally keeping the said switch 35 in its full-line position, as shown in Fig. 12. The switch 34 is connected to a short shaft 53, having an arm 54, which by link 55 is jointed to a lever 56, having its fulcrum at 57, the said lever at its opposite end having a stud 58, which at the proper time is acted upon by a switch-point 59, pivoted at the front end of the auxiliary raceway 60, projecting from the plate *m²⁰*. The auxiliary raceway 60 is concentric with relation to the main raceway *m¹⁹*, having at its front end the switch-point *m¹⁷*. (See Fig. 21.) The switch-point 59 is attached to a short shaft 61, having its bearings in the plate *m²⁰*, and this shaft has at its opposite end an arm 62, to which is connected loosely a wire link 63, (shown mostly by dotted lines in Fig. 1 and by full lines, Fig. 1^b,) the opposite end of the said wire being threaded and extended

through a slot in the lower end of a short elbow-lever 64, (represented by dotted lines in Fig. 1 and in full lines Fig. 1^a.) beyond which arm the said rod has applied to it a nut 600, the inner arm of the said elbow-lever receiving through it the long arm of the lever *m*, adapted to be moved, as will be hereinafter described, by a pattern-wheel to throw the switch-point 59 up or down at the proper time, it being moved up when it is desired to actuate the lever 56 to turn the switch 34, the switches 30, 31, 32, and 33 having, however, been previously thrown from their full into their dotted line positions in Fig. 12 to form in the cam No. 8 a cam groove or path of the shape substantially as represented by the full lines in the diagram Fig. 6, the cam No. 8 at such time causing the harness-lever *d* to be moved in such time and order with relation to the harness-levers *a b c* as to weave the solid web or portion 102, (see Fig. 7.) constituting the bottom of two adjacent pockets. The rod or link 63 referred to has a collar 601 and a spiral spring 63^a, located between the said collar and lever 64, the said spring preventing the breaking of the switch-point 59 if the latter is not in proper position when the stud 58 is about to engage it. The said switch-point 59 is moved down when the switch 34 is to be permitted to return to its full-line position in Fig. 12. Normally the switch 34 is held in its full-line position, Fig. 12, by the spring 65, connected to the lever 56, and the hub of the cam No. 8, as in Fig. 11.

When it is desired to weave the tubular portion 103 of the pocket, all the switches of the cam No. 8 will be as represented by full lines in Fig. 12, leaving a cam-path shaped as shown by full lines, Fig. 4; but when it is desired to weave the two independent plies 104 and 105 of the fabric at the end of the tubular portion one ply being superimposed upon the other, each ply having two regular selvages, then the switch-points 30, 31, 32, and 33 will be swung from their full into their dotted-line positions, Fig. 12, the switches 34 and 35 remaining, however, in their full-line positions, the cam-path made by the switches in such position being as shown by full lines, Fig. 5. The movement of the switches 30, 31, 32, and 33 is effected by the action of the switch-point *m*¹⁷, located at the end of the raceway *m*¹⁹ on the lug 45 of the arm 44, attached to shaft 43, carrying the switch-point 33, the said shaft, through the sector-gears 42 41, and the said arm 44, through the link 48, arm 49, shaft 39, sectors 38 and 37, and shaft 36, moving all the said switches 30, 31, 32, and 33 in unison. The lever *h*, through the rod 66, preferably having a spring 67 as a part of it, is connected to an arm 68 of a rock-shaft 69, extended across the loom, as herein shown, near its top, the said shaft at its opposite end having an arm, as 70, which by a link 71 is attached to an arm 72 of a short shaft 73, having connected to it a switch-point 74, pivoted at the front end of the semicircular raceway

75, forming part of a stand or bracket 76, bolted to the loom side. (See Fig. 22.)

The shuttle-box-actuating cam H (shown on an enlarged scale in Figs. 18 and 19) has a rearwardly-extended stud H¹, which is passed through a hole in the hub H², extended from the plate 76, the said stud having secured upon its inner end a gear H³, (shown by dotted lines in Fig. 2 and full lines, Fig. 1.) driven by a pinion H⁴, attached to the shaft H⁵, which in practice will be extended across the lower portion of the loom and be provided with usual picker-operating cams, (not shown,) the said shaft deriving its motion of rotation through a gear H⁶ thereon, which is driven by a gear H⁷, fast upon the crank-shaft. The shuttle-box-actuating cam H has an irregular outside wall 77, and a partly-concentric inner wall 78, and a hub 79. At the ends of the wall 78 are mounted, respectively, rock-shafts 80 and 81. The rock-shaft 80 has connected with it a switch 82 and an arm 83, the arm being acted upon by a spring 84, which normally keeps the switch-point 82 in its full-line position, Fig. 18. The rock-shaft 81 has connected to it a switch-point 85 and an arm 86, having a lug 87, the shorter end of the arm 86 having attached to it a spring 88, which normally keeps the switch-point 85 in its dotted-line position, Fig. 18. When the switch-point 82 is in its full-line position and the switch-point 85 in its dotted-line position, then the roller or other stud 89 (see Fig. 2) at the inner end of the shuttle-box lever 90, having its fulcrum at 91 and connected in usual manner to the shuttle-box rod 92, is made to travel in a substantially circular groove, and, as a result thereof, the shuttle-box rod is held stationary, so that one shuttle—viz., that in the upper box of the two boxes—is thrown through the shed formed in the warps, that shuttle being the one employed, as herein shown, when the solid portion, as well as the tubular portion, of the pocket fabric is being woven.

When it is desired to weave the two superimposed plies with selvaged edges, then the switch-point 74 (see Fig. 22) is raised into its dotted-line position, so that when the stud or projection 87 reaches it the arm 86 is moved to turn the rock-shaft and place the switch-point 85 in full-line position, Fig. 18, and thereafter the roller or other stud 89 is, by the said switch-point 85, thrown out of the circular groove into the irregular groove between the walls 77 and 78, the said roller or other stud on its arrival in contact with the switch-point 82 passing the same, the latter being held only by the spring 84. As long as the switch-point 85 is held in its full-line position the shuttle-box lever will be moved up and down at the proper times to permit the shuttle in the undermost box to be thrown across and then back in sheds formed in the warps constituting one ply of the fabric, while alternating with it the other shuttle will be thrown through the shed in the warp consti-

tuting the other ply of the fabric, the two shuttles at such times working alternately, each to furnish its weft-threads for one of the said plies.

- 5 The shuttle-box rod 92 has at its upper end usual shuttle-boxes 92^x, supposed to contain two cells or divisions and capable of carrying two shuttles, the said boxes rising and falling, as usual, in usual guides attached to the lug L.

I have not herein described the devices for actuating the roll C², as they are substantially as in my patent referred to, so that it need not be herein described.

- 15 Figs. 4, 5, and 6, by the full lines, show the shape of the cam-paths formed, respectively, in the cam No. 8 by a change of the position of its switches when the tubular portion 103, the open selvage portions 104 and 105, and the bottom portions 102 of the bag are being woven, as has been described, the dotted lines in the said figures showing the positions of the other cams 1, 2, and 3 at the same time that the groove in the cam No. 8 is shaped, as shown in each of the said figures, and one or the other of the different parts of the fabric are being woven. The switch-point *m*¹⁷ common to my said patent derives its motion from the link 107, attached to the arm 106 of the rock-shaft *h*⁴, the switch-points *m*¹⁷ and *h*¹⁰ being moved in unison. The lever *h*, near its outer end, is passed through a rod suspended from a spring 108, and the inner end of the lever *m* is passed through a similar rod suspended from a spring 109, the said springs and rods acting normally to keep the short arms of the said levers *h m* or their points against the pattern-wheel to be described, which moves the said levers at the proper times to change the style of weaving.

- Referring to the drawings, the stud or bolt C⁸, sleeve C⁷, the pinion C⁵ thereon, the stationary cam D, the dog D², pivoted at the rear side of the pattern-wheel upon a stud D', the spring D³, the upper end of the said dog being extended entirely across the full width of the pattern-wheel, are all substantially as in my patent referred to, where like parts are designated by like letters.

- 50 Fig. 15 shows the outer face of the pattern-wheel; Fig. 17, its innerface, and Fig. 16 shows a partial top view and section thereof. The pattern-wheel shown in the said figures has at its periphery near its outer side, in line with only the lever *h*, a projection 110, which acts upon the said lever to actuate it and by its connections turn the switch-points *h*¹⁰ and *m*¹⁷ and the shuttle-box switch 74, when the two superimposed plies of the fabric are to be woven with selvages at opposite sides, as stated, the short arm of the lever *m* at such time resting upon the periphery of the pattern-wheel, as at 115, (see Fig. 16,) at the side of the projection 110. During the rotation of the pattern-wheel in the direction of the arrow upon it, (see Fig. 15,) the two superimposed plies of the fabric having been woven

for the proper length, the lever *h* drops from the rear end of the enlargement or projection 110 upon the surface 112 of the pattern-wheel, and in the further rotation of the said pattern-wheel both levers *h* and *m* ride on the said surface 112, the said surface being of sufficient length to determine the length of the tubular part of the pocket. As the tubular portion is being woven, the outer end of the dog D², resting on the cam D, is thrown toward the rear end of the portion 112 of the pattern-wheel, and after the tubular part has been woven for the proper length the edge of the dog D² in the rotation of the pattern-wheel arrives under the points of the levers *h* and *m*, and at the same time the spring-pressed inner end of the said dog (see Fig. 17) drops off the shoulder of the eccentric-cam D and the said dog acts quickly to lift the points of the levers *h m* up high enough to come squarely upon the surface 113, which is of the full width of the pattern-wheel. The points of the two levers *h m* rest on the projection 113, while the solid portion of the fabric for the bottom of the pocket is being woven, and the solid fabric having been woven a sufficient length the points of the levers *h m* drop upon the uniform surface 114, which is a counterpart of the surface 112, and while the surface 114 acts upon the said levers *h m* another tubular portion is woven. In the further rotation of the pattern-wheel, proceeding as described, the eccentric-cam 118, held stationary by a suitable stud, as 119, acts upon the spring-pressed inner end of the lever 120, pivoted upon the pattern-wheel on its outer face at 121, and causes the outer end of the said lever 120, which is only the width of the projection 110 to meet the rear end of the surface 114 just as the points of the two levers *h m* are ready to pass from the surface 114, and at this time the inner end of the lever 120 drops from the shoulder of the cam 118, and in so doing its outer end acts upon the lever *h*, turning the latter quickly, so that its point will readily come upon the leading end of the projection 110, ready to again commence weaving the superimposed selvage plies of the fabric. The shaft A⁴ has its bearings in brackets or stands 162, and the lever 64 has as its fulcrum a stud 163, extended laterally from a bracket 164, secured to and extended from the loom side. The gear *t*¹⁰ (shown in Fig. 1) is one of the take-up gears.

Referring to Figs. 4, 5, and 6 of the drawings, they show, respectively, the cam-paths of the several cams No. 1, No. 2, No. 3, and No. 8 in their proper relation to each other on one common shaft to enable the three different kinds of fabric to be woven, Fig. 4 showing the cams in position to produce the tubular part of the pocket, Fig. 5 the superimposed independent plies having each two selvages, and Fig. 6 the solid fabric for the bottom of the pocket. It being supposed that the cams have been working in the position,

Fig. 6, to form solid fabric for the bottom of a pocket, the switches in cam No. 8 will be put into the full-line position, Fig. 12, which will then make the cam-path of the cam No. 8, as shown by full lines in Fig. 4, and the switches in the cam No. 1 will be changed to put them into the dotted-line position, Fig. 10, and then tubular weaving may be done. A tube having been woven of the proper length, it is desired to leave both side edges of the tube open to produce superimposed independent plies with selvage edges. To do this, the switches 33 and 32 and 30 and 31 of Fig. 12, cam No. 8, are made to assume their dotted-line positions, Fig. 12, and the switches in cam No. 1 are made to occupy the dotted-line positions, Fig. 10. A proper length of fabric having been woven one ply over the other with two selvages, the cam-switches 33 and 32, 30 and 31 are returned to their full-line positions to make cam-paths according to diagram, Fig. 4, and tubular weaving is again commenced, and a tube having been woven for another pocket all the switches in cam No. 8 are put into the dotted-line positions, Fig. 12.

I claim—

1. In a loom for weaving a pocket fabric, a series of harness-frames, a series of harness-levers to which they are connected, a cam-shaft, and a series of cams Nos. 1 2 3, and a cam No. 8 to actuate the harness-levers, the cam No. 8 having six switches 30, 31, 32, 33, 34, and 35; and cam No. 1 having the switches h^{14} h^{15} h^{17} h^{18} , combined with means, substantially as described, to rotate the shaft carrying the said cams and to actuate the switches of cam No. 1 and No. 8, whereby a fabric may be made having solid portions to constitute bottoms for pockets, tubular portions, and portions of double fabric having two plies superimposed, each ply having two selvaged edges, substantially as described.

2. In combination, a series of harness-frames, harness-levers to which they are connected, a cam-shaft, a series of cams 1, 2, 3, and 8, mounted thereon, the cams Nos. 1 and 8 having switches h^{14} h^{15} h^{17} h^{18} and 30 31 32 33 34 35, respectively, as described, raceways h^9 , m^{19} , and 60, switch-points h^{10} , m^{17} , and 59, the rock-shaft h^4 , the lever h and its connections to move the rock-shaft h^4 , connections intermediate the same and the switch-points h^{10} and m^{17} , the lever m , its connections to move the switch-point 59, pattern mechanism for controlling the positions of the levers h and m , a series of shuttle-boxes, a shuttle-box lever, connections between the shuttle-boxes

and shuttle-box lever, a shuttle-box cam containing switches, the switch-point 74, means intermediate it and the shuttle-box cam-switches to actuate the latter, and means intermediate the lever m and the switch-point 74 to actuate it, to operate substantially as described.

3. The pattern-wheel having the surfaces 110 112 113 114, the dog D^2 , lever 120, and stationary cams 118 and D, and springs to actuate the said dog and lever, combined with the levers h and m , to operate substantially as described.

4. The lever h , the pattern-wheel to actuate it, the lever 64, rod 63, arm 62, rock-shaft 61, switch-point 59, and raceway 60, combined with the cam No. 8, the lever 56, pivoted to said cam, and having the projection 58, the spring 65, the link 55, arms 54 51, the spring 52, rock-shafts 53 and 50, and switch-points 34 and 35, to operate substantially as described.

5. The series of shuttle-boxes, the shuttle-box lever having a stud, means to connect the shuttle-boxes and shuttle-box lever, the rotating shuttle-box cam H, having flanges 77 78, and spring-held switches 82 85, the arm 86, having a projection 87, the switch-point 73, and raceway 75, and the lever h , and intermediate connections to move the said switch 73, combined with the pattern-wheel having the projection 110 to operate the lever h , substantially as described.

6. The series of shuttle-boxes, the shuttle-box lever, connections between the said shuttle-box and shuttle-box lever, the rotating shuttle-box-operating cam H, having the flanges 77 78, the hub 79, the switches 82 and 85, the rock-shafts 80 and 81, carrying the said switches, the arms connected with the said rock-shafts, their attached springs, and the arm 86, having the projection 87, combined with the raceway 75, its switch-point 74, and means to actuate the said switch-point, whereby the switch 85 may be opened or closed at will to change the shape of the cam-groove in the shuttle-box cam H, to enable the said cam to either actuate the cam-lever or leave it at rest, substantially as described.

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

JOHN T. MEATS.

Witnesses:

G. W. GREGORY,
J. C. SEARS.