

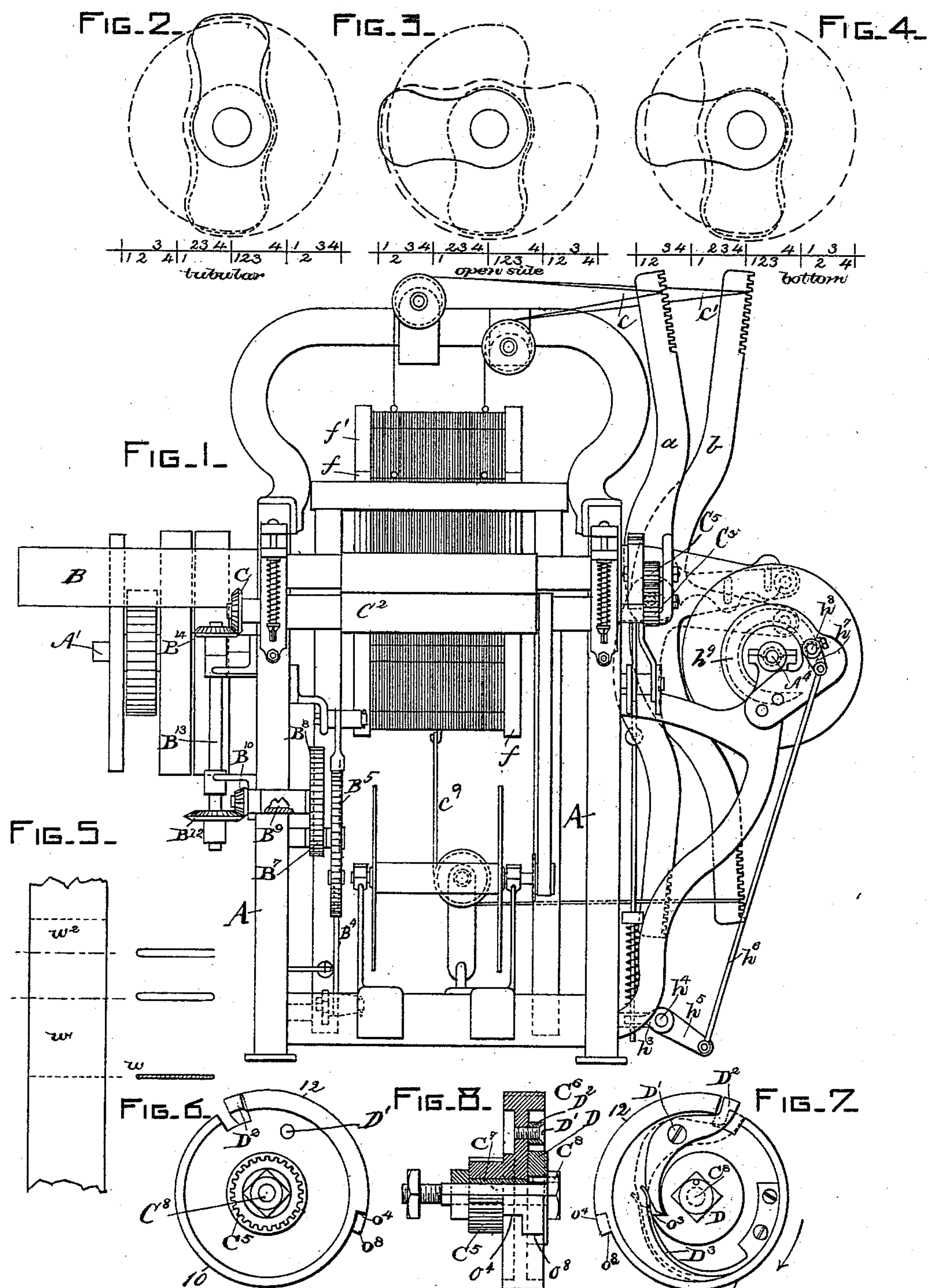
(No Model.)

2 Sheets—Sheet 1.

J. T. MEATS.
LOOM FOR WEAVING POCKETS, &c.

No. 379,484.

Patented Mar. 13, 1888.



WITNESSES

Fred L. Emery
John F. C. Pringle

INVENTOR

John T. Meats
by Leroy & Gregory
attys.

(No Model.)

2 Sheets—Sheet 2.

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FIG. 11.

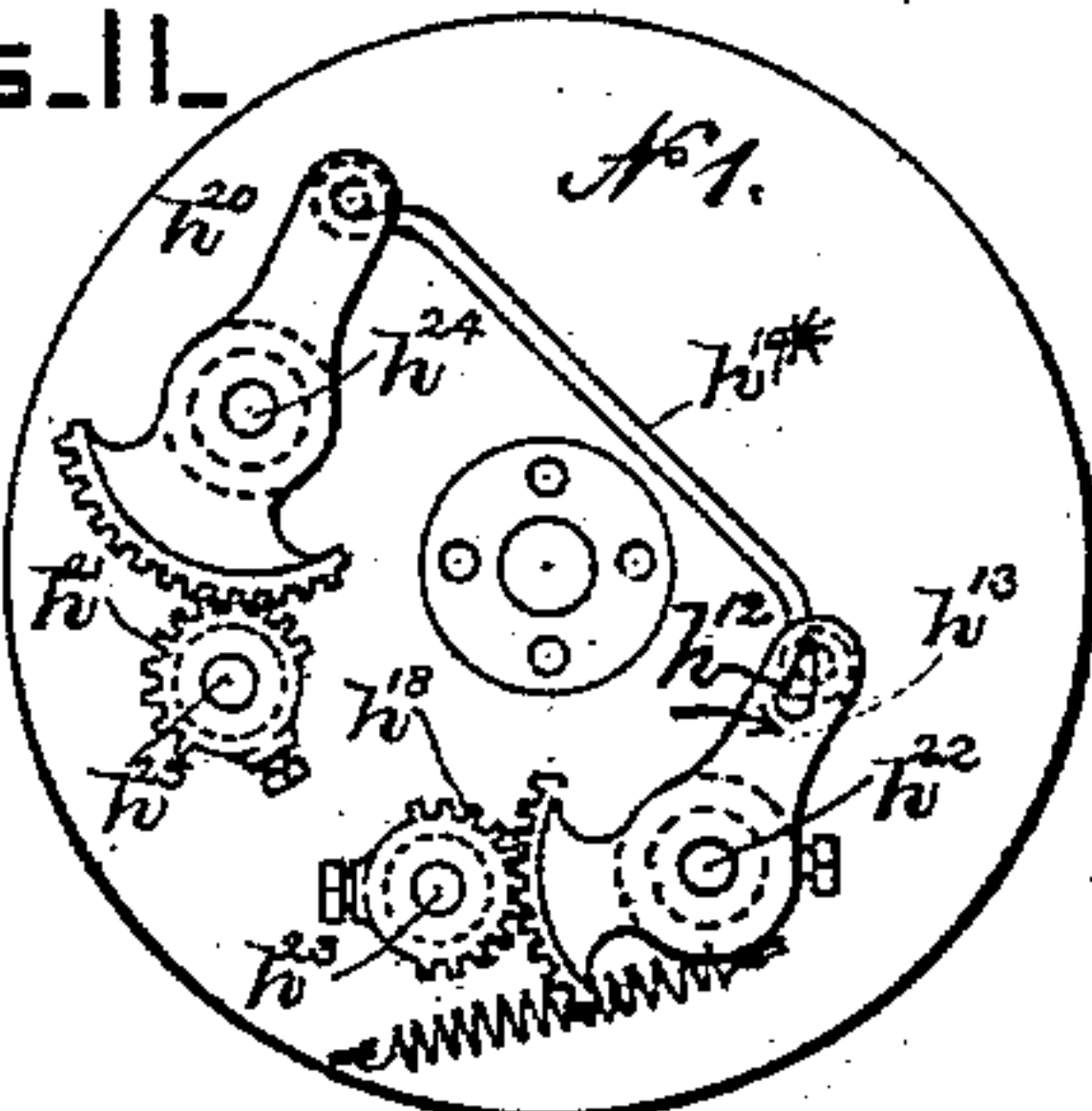


FIG. 10.

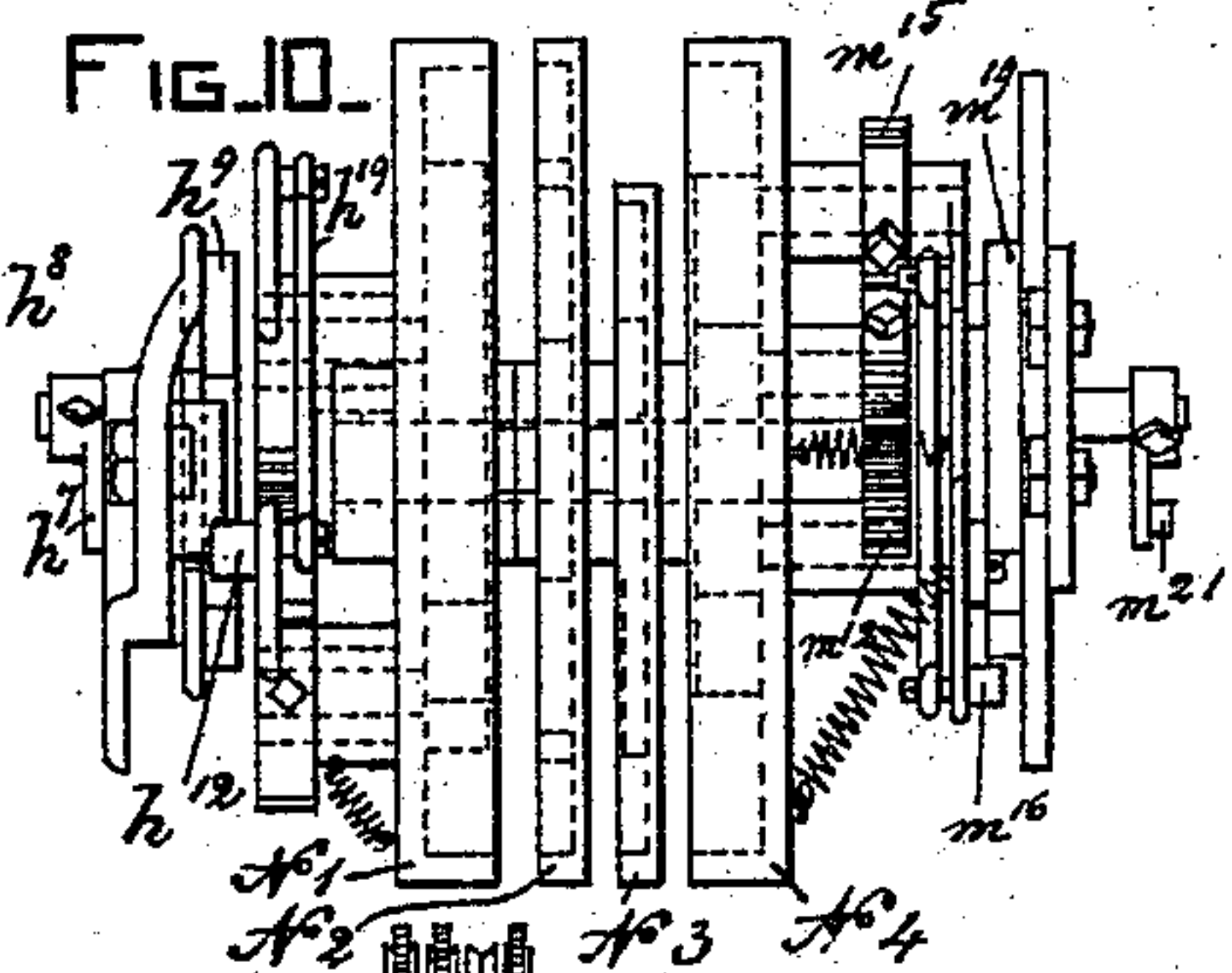


FIG. 13.

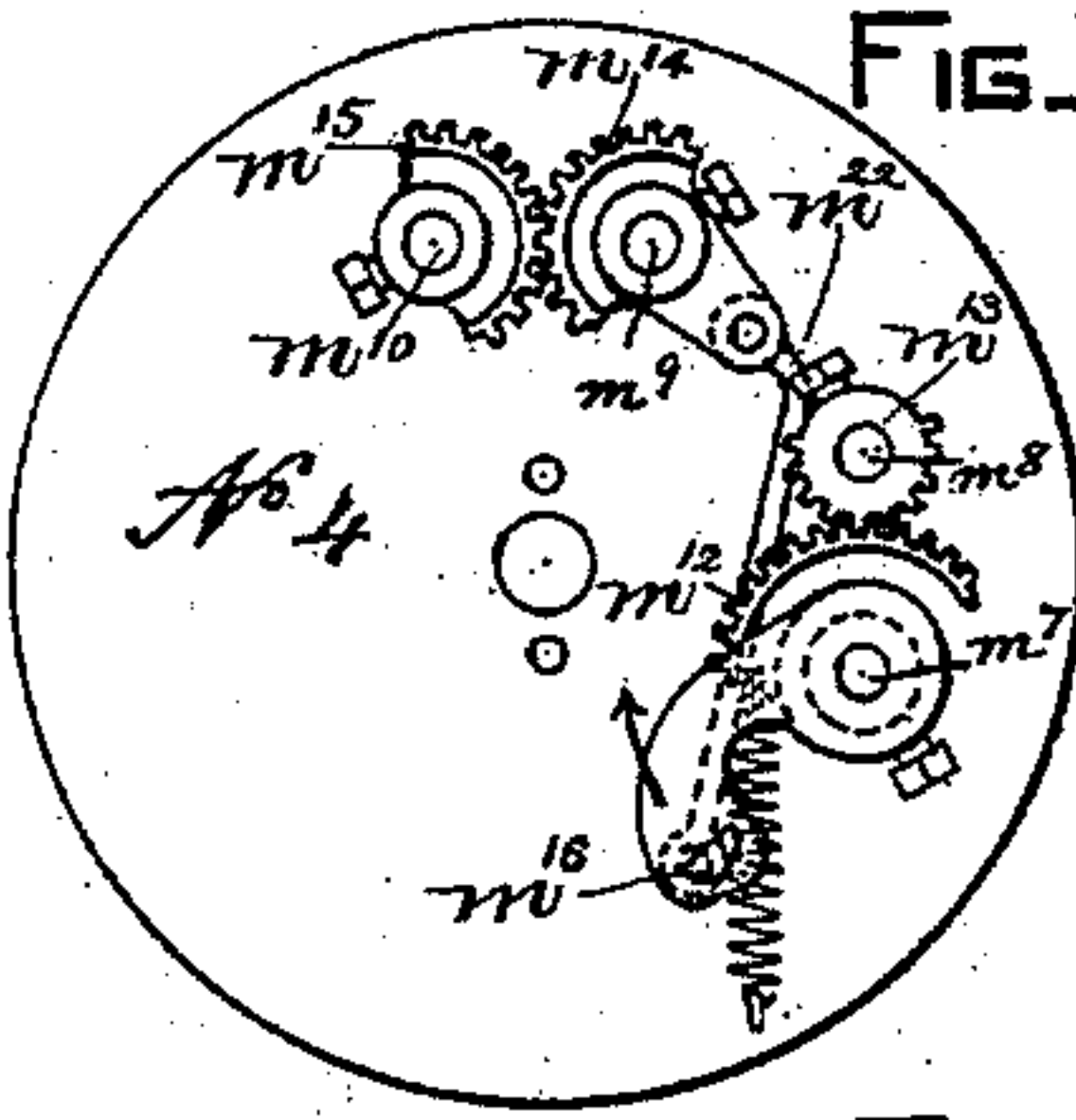


FIG. 12.

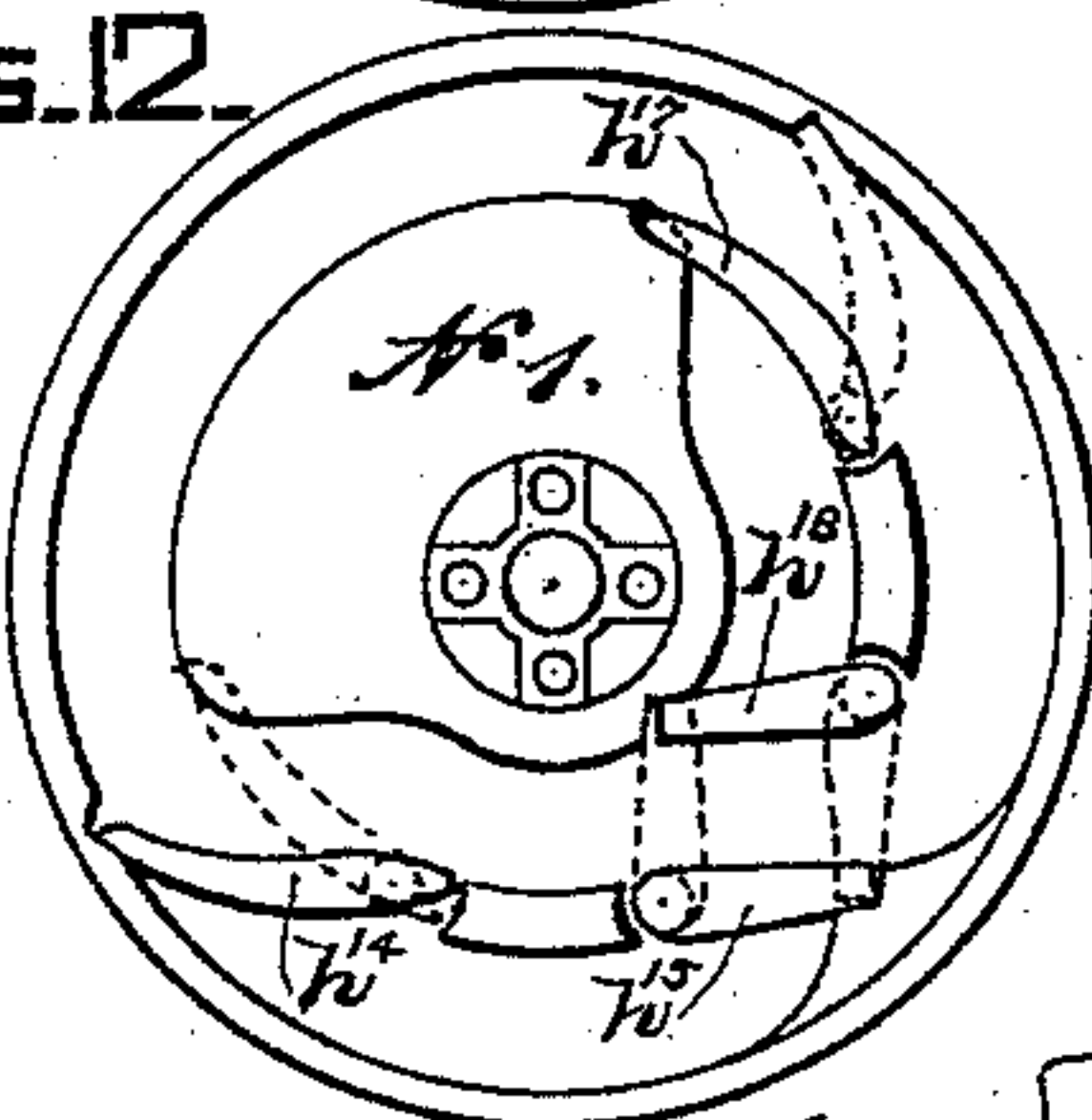


FIG. 14.

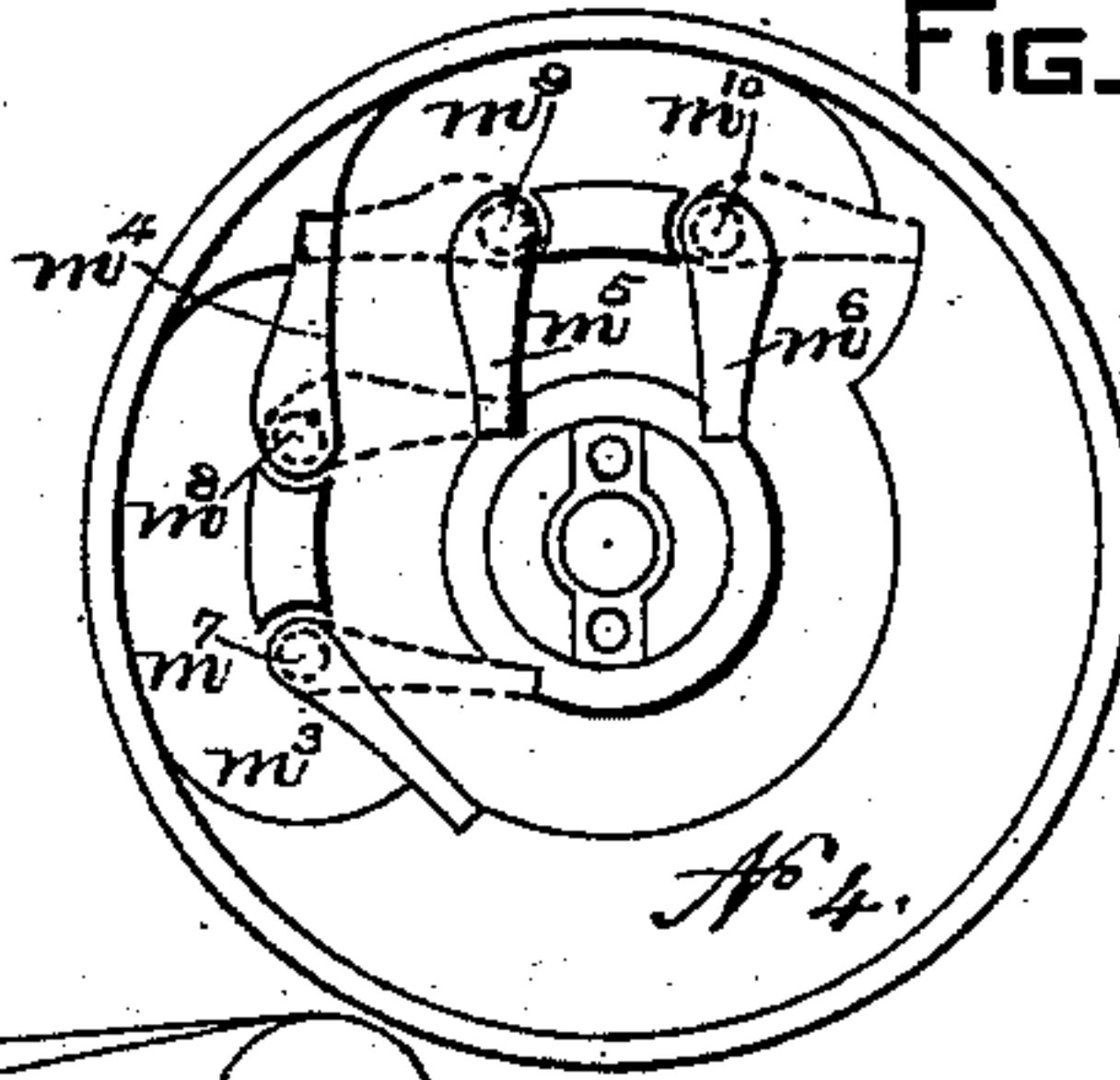


FIG. 9.

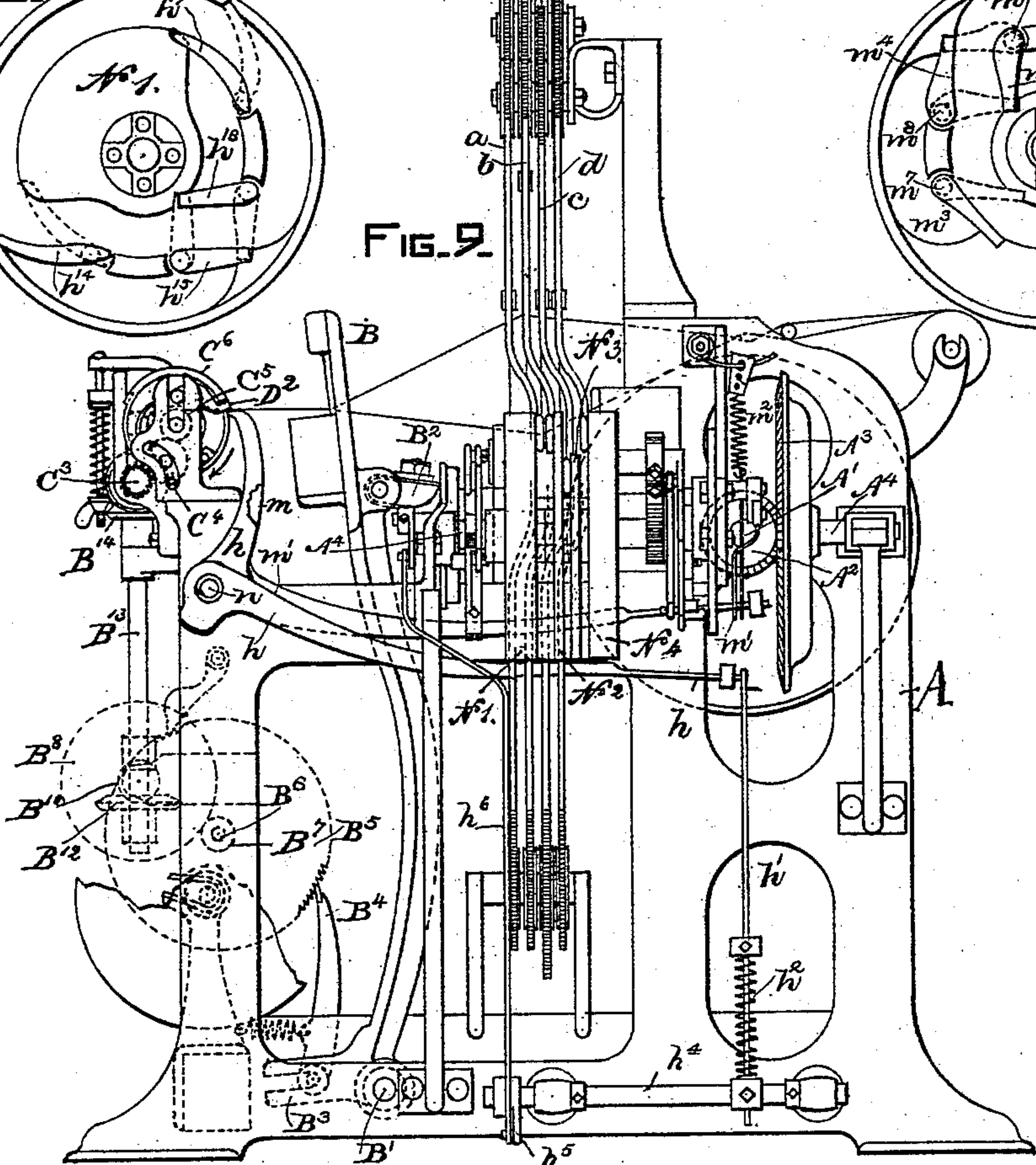


FIG. 17.

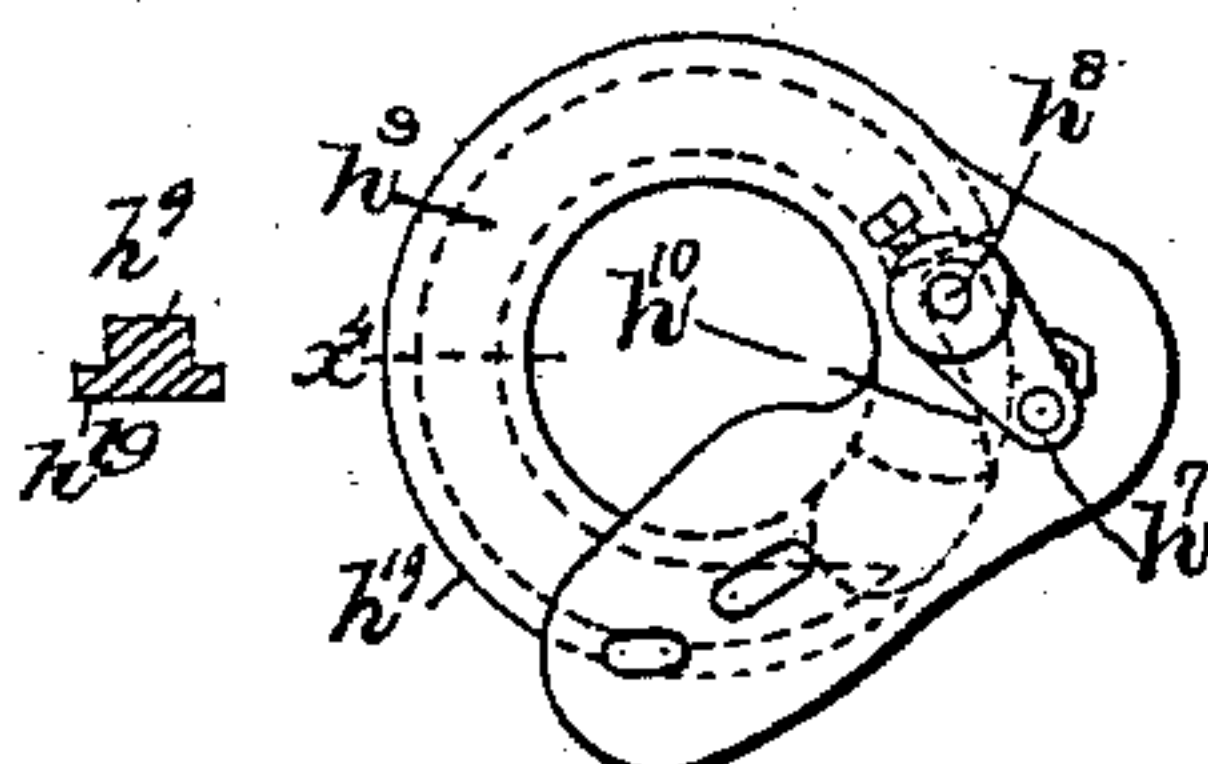


FIG. 15.

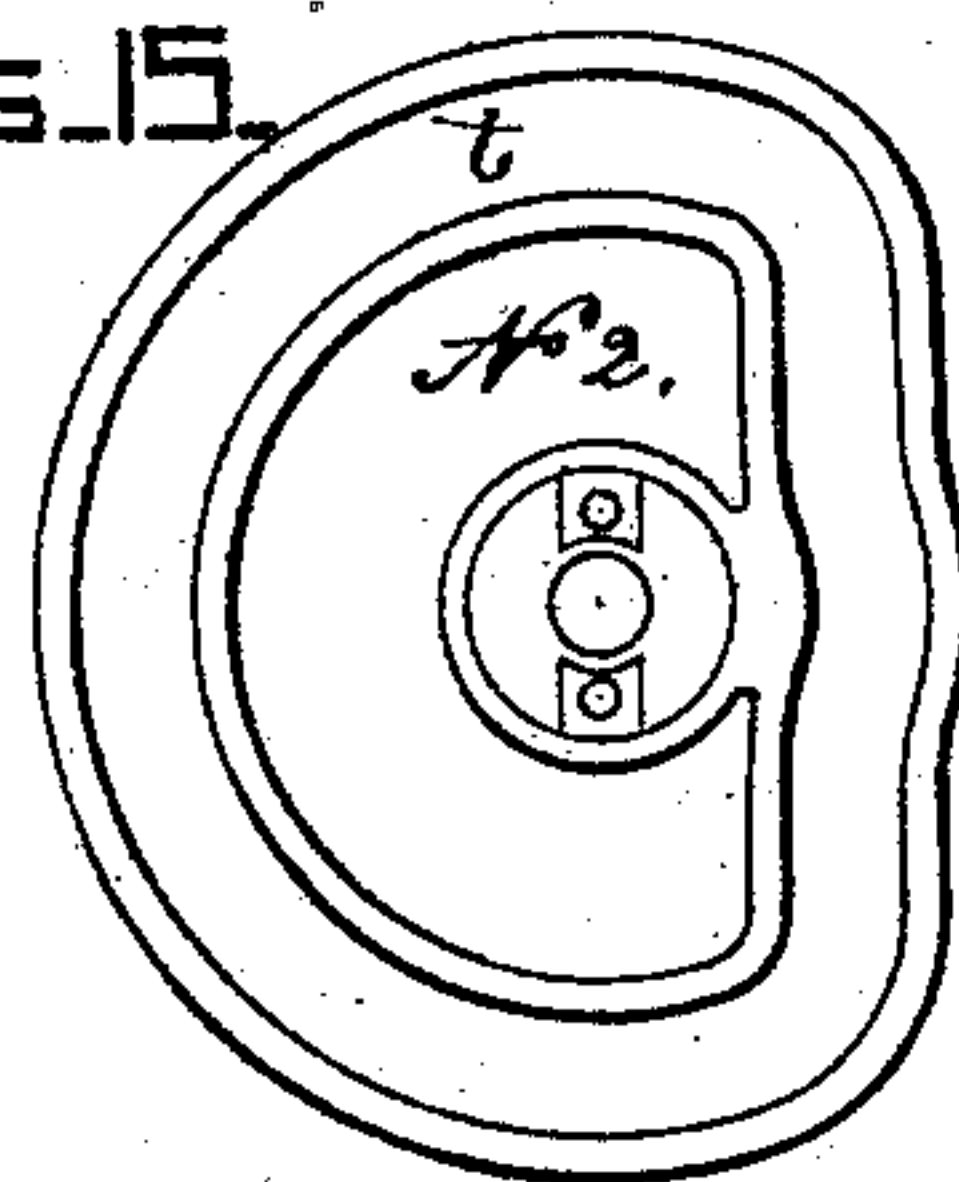


FIG. 16.

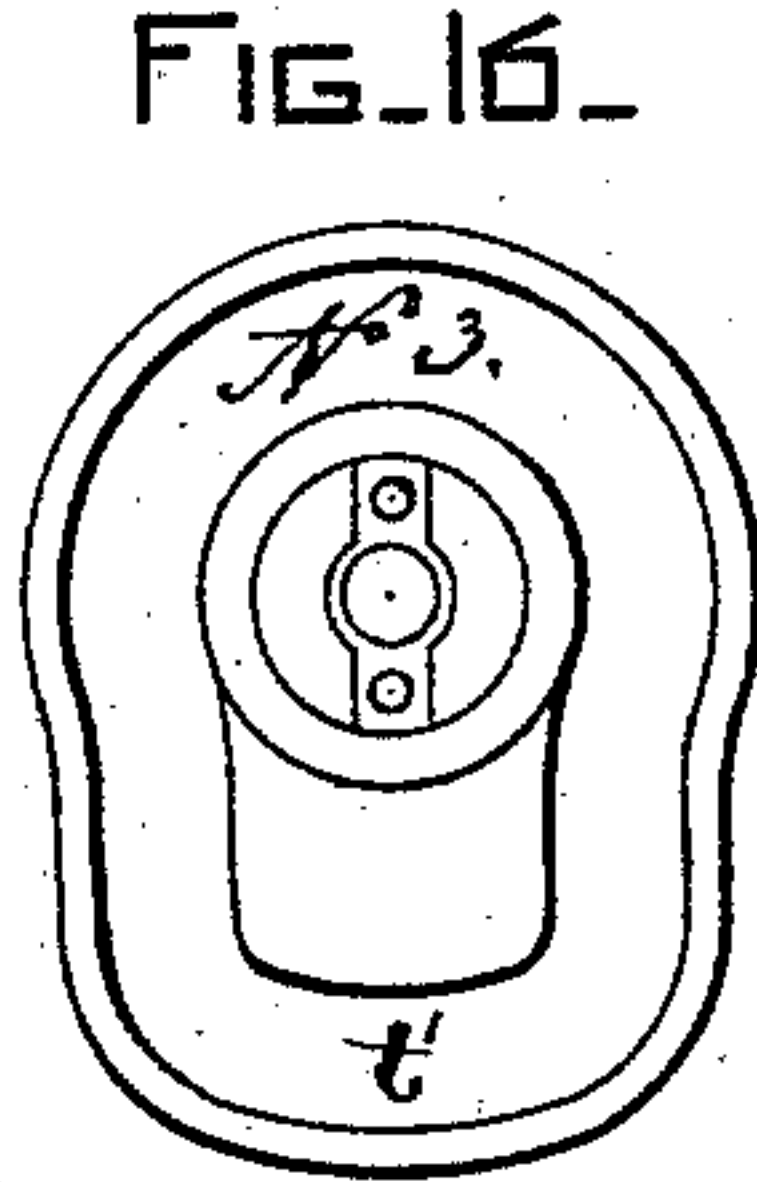
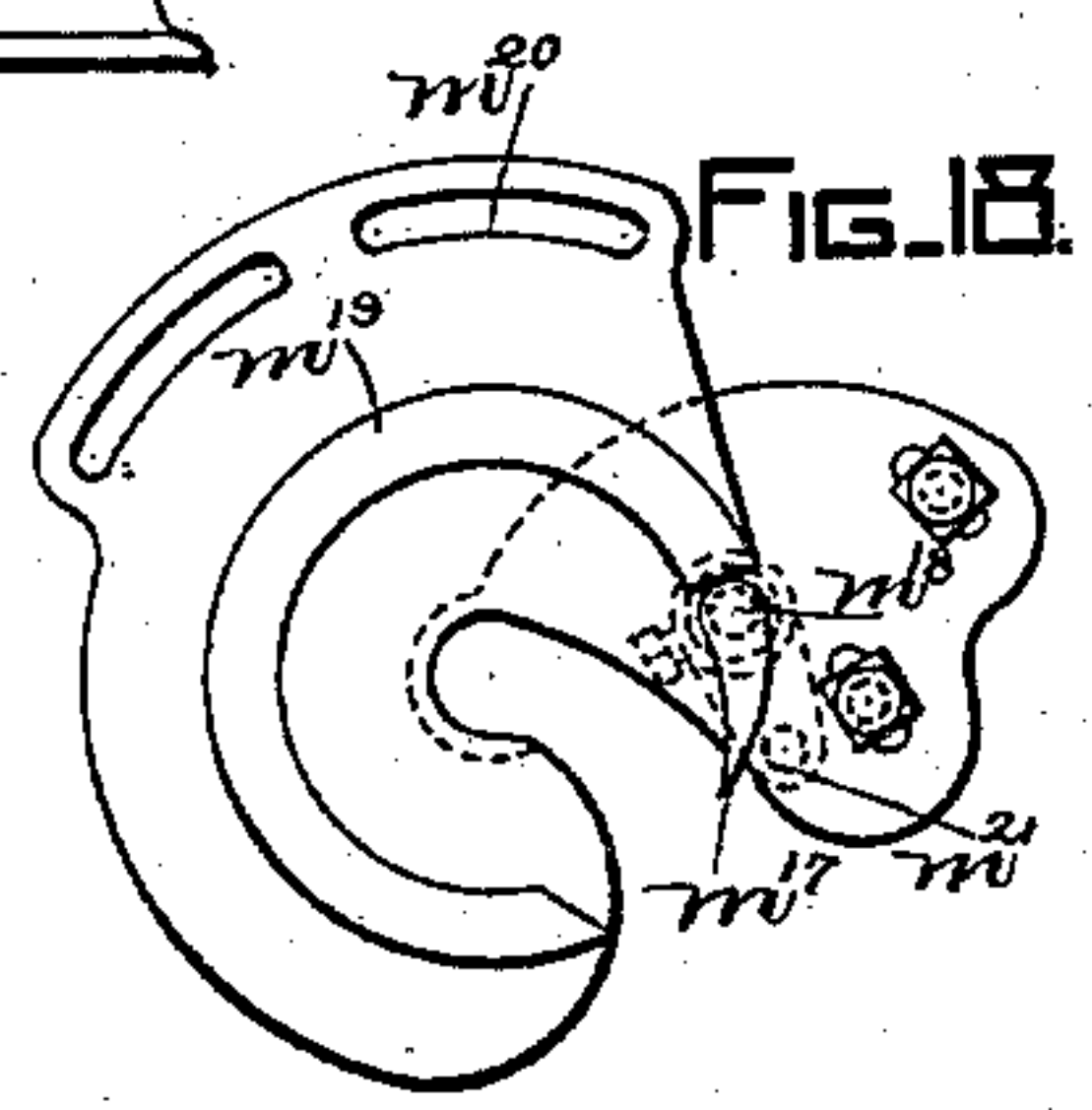


FIG. 18.



WITNESSES

Frederic L. Emery,
John F. C. Prins.

INVENTOR

John T. Meats.
by Crosby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

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

LOOM FOR WEAVING POCKETS, &c.

SPECIFICATION forming part of Letters Patent No. 379,484, dated March 13, 1888.

Application filed March 16, 1887. Serial No. 231,097. (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, &c., of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object the production of a loom by which to weave pocket fabric, substantially such as described in United States Patent No. 303,211, dated August 5, 1884. The loom to weave the fabric to be herein described has four, or, it may be, more, sets of harnesses, which at times, as when the fabric is being woven for the bottom of the pocket, bring all the warps together to form with the weft a solid fabric; but at other times, as when the body of the pocket is being woven, the threads of the warp are separated to form successive sheds for the passage of the weft and the formation of a tubular fabric, and then again the warps are so shed for the passage of the filling as to enable one edge of what would otherwise be the tubular fabric to be left open and provided with two selvage edges, one above the other, to thus form an opening for the side of the pocket.

Hitherto the difficulty and expense attendant upon weaving fabric of the class referred to has been very great, because of the great length of pattern-chain necessary to be employed; but in my experiments I have devised a system of cams containing grooves and provided with sets of switches, which have combined with them switch-moving mechanism whereby the switches may be changed or shifted automatically to enable the sheds for the reception of the weft or filling to be changed according to the particular requirements of the fabric.

In accordance with my invention each of the four harness-frames is actuated by its own special cam, all of the cams being attached to a shedding-cam shaft rotated at one fourth the speed of the crank or lay shaft, the cams for moving the second and third harness-frames from the front of the loom being so arranged one with relation to the other as to depress the second harness-frame for three picks and lift it for one pick, the third cam acting reversely,

or lifting the third harness-frame for three picks and lowering it for one pick; or, in other words, the third cam mocks the second cam, the said second and third cams working in the same manner throughout.

To determine the character of the fabric as it progresses—that is, to determine whether it shall be woven as a solid fabric for the bottom of a pocket, or tubular, or as a partial tube open at one side—I depend upon the first and fourth cams attached to the said shedding-cam shaft, the said cams controlling the first and fourth harness-frames, respectively, as will be described. The first and fourth cams, to enable them to be so used, are provided with sets of switches which are shifted at the desired times to change the configuration of the cam-path in order to change the order of lifting and raising the first and fourth harness-frames with relation to the second and third frames actuated always in the same order by their cams.

My invention consists, essentially, in the combination, with changeable cams, harness-frames, and intermediate connections, of means, substantially as will be described, by which to automatically effect the changes in the said cams to effect changes in the character of the fabric.

Other features of my invention will be hereinafter described, and pointed out in the claims.

Figure 1 in front elevation represents a sufficient portion of a loom embodying my improvements to enable my invention to be understood. Figs. 2, 3, and 4 represent in detail and by different lines the cam-paths of the several cams employed, the pattern-scale beneath the said figures representing the positions of the respective harness-frames, whether up or down, for respectively the tubular portion of the pocket, the open portion, and the solid fabric for the bottom of the pocket. Fig. 5 shows a face view and three sections of the fabric to be produced on the loom, to be described. Figs. 6, 7, and 8 show, respectively, two side views and a section of the pattern surface or wheel to determine the order of the shifting of the switches. Fig. 9 is a right-hand end elevation of Fig. 1; Fig. 10, an enlarged view of the cams and devices for moving the switches, detached from Fig. 9; Figs.

11 and 12, opposite side views of cam No. 1, for moving the harness-frame nearest the breast-beam, the full and dotted lines in Fig. 12 showing the switches in their different positions. Figs. 13 and 14 are like views of cam No. 4, for moving the fourth harness-frame. Figs. 15 and 16 represent the cams No. 2 and No. 3, for moving, respectively, the second and third harness-frames. Fig. 17 shows an outside view of the raceway co-operating with the switch-moving mechanism of cam No. 1 and a view in section on the line x^4 of said outside view, and Fig. 18 is an inner side view of the raceway employed with the cam No. 4.

The loom-frame A, of suitable shape to sustain the working parts, has suitable bearings for a crank or lay shaft, A' , provided with usual fast and loose pulleys, (shown at the left of Fig. 1,) and with a hand-wheel and a pinion, the latter being instrumental in operating the picking mechanism, (omitted from the drawings.)

The crank-shaft has at its right-hand end, as herein shown, a bevel-pinion, A^2 , (see Fig. 9,) which engages a bevel-gear, A^3 , of four times its size, secured to the shedding-cam shaft A^4 , the latter shaft rotating once while the crank or lay shaft rotates four times. The shaft A^4 has secured to it four cams, (marked No. 1, No. 2, No. 3, and No. 4,) all the said cams being shown separately in other figures.

The loom herein shown is supposed to contain four harness-frames, which will be designated as the first, second, third, and fourth harness-frames, the drawings, Fig. 1, showing clearly two of the said frames, $f f'$, which are of usual construction, the said harness-frames being connected, respectively, by usual cords or straps, $c^9 c^{10}$, to the harness-levers $a b c d$, the first harness-frame, f , or the one nearest the lay, being connected to the harness-lever a , and so on. Each harness-lever has a backwardly or outwardly extended arm, (shown by dotted lines,) provided with a roller-stud to enter a cam-groove in the cam to actuate the said harness-lever, the said levers and studs being common.

The lay B, pivoted at B' and actuated by usual pitmen, B^2 , connected to it and to the crank-shaft A' , has at its lower end a pawl-carrying projection, B^3 , to which is pivoted a pawl, B^4 , which, moved by the lay at each backward beat, engages a ratchet-wheel, B^5 , loose on a stud, B^6 , the hub of the said ratchet-wheel having a pinion, B^7 , which engages a gear, B^8 , on a short shaft, B^9 , having at its outer end a bevel gear, B^{10} , which, by a bevel-gear, B^{12} , shaft B^{13} , and bevel-gear B^{14} , engages a bevel-gear, C, on the shaft of and rotates the lower take-up roll, C^2 , provided at its other end with a pinion, C^3 , which engages (see Fig. 9) an intermediate, C^4 , (shown partially in full and partially in dotted lines,) the said intermediate engaging a pinion, C^5 . (Shown dotted in Fig. 9 and by full lines, Fig. 6.) The pinion C^5 (see Fig. 8) is fast to and forms part of the hub of the pattern-wheel C^6 , the said hub

being free to rotate on a sleeve, C^7 , fixed to the frame-work by a bolt, C^8 . This bolt C^8 has pinned to the under side of its head a scroll-cam, D, the heel o^3 of which is located in just its correct operative position before the bolt is set up or tightened in place.

The pattern-wheel referred to, loose on the sleeve C^7 and rotated intermittently through the action of the gear described co-operating with the take-up, has pivoted upon it, at D^1 , a dog, D^2 , against which acts a spring, D^3 , the spring normally acting to keep the inner end of the dog pressed against the scroll-cam D, and as the pattern-wheel is rotated the dog, bearing against the stationary scroll-cam, is moved to occupy the full and dotted line positions, Fig. 7.

The periphery of the pattern-wheel is of sufficient width to receive against it the ends of the shorter arms of two like elbow-levers, $h m$, mounted on a stud, n , the rear ends of the said levers being connected to rods h' and m' , each rod being acted upon by a suitable spring, as $h^2 m^2$, to normally keep the ends of the short arms of the said levers against the pattern-wheel. This pattern-wheel C^6 through the said levers actuates arms of rock-shafts held in the raceway-blocks, to be described.

The change of position of the switches to be described has to be very quick in order to not interfere with the picking and shedding at high speed, and to operate the levers h or m quickly when passing from the portion of the pattern-wheel of smallest diameter to the portion thereof of largest diameter I have provided the pattern-wheel with the dog referred to.

In practice, when the tubular part of the pocket is commenced, the short arms of the levers $h m$ rest against the smaller diameter, 10, (see Fig. 7,) of the pattern-wheel C^6 next the heel O^8 , the said levers continuing to bear against the smaller diameter of the pattern-wheel as the latter is rotated until the tubular part of the pocket has been completed, at which time the end of the dog, it then occupying its dotted line position, (see Fig. 7,) in the rotation of the pattern-wheel, comes under the ends of the levers h and m . Immediately at this time the inner end of the dog slips off from the point o^3 of the cam D into the full-line position shown in Fig. 7, the dog in its movement quickly and instantly moving the levers $h m$, so that their ends come immediately up to and upon the larger periphery, 12, of the pattern-wheel C^6 , and the levers are acted upon by the said larger portion of the pattern-wheel while that portion of the pocket is being woven which has one open side. By the time that the cut-away portion, as o^4 , of the larger portion of the pattern-wheel (see Figs. 6, 7, and 8) arrives opposite the end of the lever m the part of the pocket open at one side (see Fig. 5) is completed, and the end of the lever m drops off the said shoulder o^4 , which effects such a change in the shedding as to make a solid fabric for the bottom

of the pocket, and in the further rotation of the pattern-wheel the other lever, h , which actuates a switch-point, h^{10} , to be described, which effects the change in cam No. 1, drops
5 off from the larger portion of the pattern-wheel, and tubular weaving is again resumed.

The rod h' at a point below the spring h^2 is extended through an arm, h^3 , of a rock-shaft, h^4 , the said rock-shaft having an arm, h^5 , to
10 which is jointed a rod, h^6 , connected to a crank, h^7 , on a short rock-shaft, h^8 , having its bearings in the block h^{10} , having a raceway, h^9 , the shaft h^8 at its opposite end (see dotted lines, Fig. 17) having a switch-point, as h^{10} , it being
15 shaped as the switch m^{17} in Fig. 18.

The switch-point h^{10} is pivoted at one end of the narrow raceway h^9 , so that when occupying the position shown in Fig. 1 a cam-lug, h^{12} , preferably pointed at its leading end, (see
20 Fig. 11,) connected to an arm of a sector-lever, h^{13} , will strike against the outer side of the switch-point and cause the said cam-lug to travel along the outer side of the raceway, the loom at such time acting to weave the
25 tubular part of the pocket; but as soon as the part of the pattern-wheel of greatest diameter acts through the devices described to shift the point of the switch h^{10} into the dotted-line position shown in Fig. 17 then the said cam-lug
30 contacts with the inner side of the said switch-point and travels along the inner side of the raceway h^9 .

Referring to Figs. 11 and 12, the full lines show the positions of the devices attached to
35 cam No. 1 when the tubular part of the pocket is being woven; and, referring especially to Fig. 12, it will be seen that the switches h^{14} h^{15} h^{16} h^{17} in their full-line positions show a cam groove of peculiar shape, in which travels the roller-stud of the harness-lever a . As soon as the
40 switch-point h^{10} is shifted, as described, through the pattern-wheel, the said switch-point acts to turn the sector-lever h^{13} in the direction opposite to that of the arrow on it, Fig. 11. The said sector-lever, through the partial gear h^{18} , a
45 link, h^{19} , a second sector-lever, h^{20} , and a second partial gear, h^{21} , turns the short shafts h^{22} h^{23} h^{24} h^{25} , carrying, respectively, the switches h^{14} h^{15} h^{17} h^{16} , turning them instantly into the dotted-line positions shown in Fig. 12. Assuming,
50 now, that the switches occupy the dotted-line position shown in Fig. 12, it will be seen that the outline of the groove formed in the cam No. 1 by the changed position of the switches is the same as when the switches are
55 in their full line position; but it will be noticed that the high and low points of the cam-groove have been changed with relation to the shaft a —as if, for instance, the cam No. 1 had been
60 turned quarter-round on its shaft.

When the loom is acting to weave the tubular part of the pocket, the switches referred to are in the full line position shown in Fig. 12; but when the tubular part is to have one
65 side open the switches are turned to occupy the dotted-line position.

When the tubular part of the pocket is being woven, the switches m^3 m^4 m^5 m^6 of cam No. 4 occupy the full line positions, Fig. 14; but
70 when the tubular part is to be left open at one side the said cams are immediately shifted to occupy their dotted-line positions, thus changing the shape of the actuating cam-groove in cam No. 4, which cam-groove is entered by a
75 roller-stud of the harness-lever d , which moves the fourth harness-frame from the front of the loom.

The change of position of the switches of both cams No. 1 and No. 4 is effected simultaneously when passing from tubular weaving
80 to a tube open at one side; but when the point of the short arm of the lever m falls off that part of the pattern-wheel C^6 of greatest diameter the switches of the cam No. 4 are shifted instantly from their dotted back to
85 their full line positions shown in Fig. 14, and several picks are thereafter made, enough to make a sufficient length of fabric to form the bottom of the pocket as a solid fabric before
90 the switches in cam No. 1 are changed back from their dotted into their full line positions shown in Fig. 12 by the passage of the lever h from the greater to the lesser diameter of the wheel C^6 .

The switches m^3 m^4 m^5 m^6 are connected, respectively, to short shafts m^7 m^8 m^9 m^{10} , the said
95 shafts at their opposite ends having attached to them, respectively, toothed sectors and gears, as m^{12} m^{13} m^{14} m^{15} . (See Fig. 13.) One arm of the toothed sector m^{12} has a cam-lug, m^{16} , which in the rotation of the cam No. 4
100 strikes against one or the other side of the switch-point m^{17} (see Fig. 18) on a short shaft, m^{18} , supported in the race m^{19} , the frame of which is properly bolted, through the slots
105 m^{20} , to a bracket attached to the loom-side. The shaft m^{18} at its end farthest from the front of the loom has attached to it a crank, m^{21} , to which is connected the link or rod m' , which is attached to the end of the lever m . When
110 the switch-point m^{17} is in the position shown in Fig. 18, the cam projection m^{16} (see Fig. 13) in the rotation of cam No. 4 will strike on the right-hand side of or outside of the switch-point m^{17} , (shown in the said Fig. 18,) and will
115 travel around on the outer side of the race m^{19} , holding the switches in the position shown by full lines in Fig. 14; but when the switch-point m^{17} is thrown out to the right from the position shown in Fig. 18 then the cam lug or pro-
120 jection m^{16} in the rotation of the cam No. 4 will strike the inner side of the switch-point, and, following along the same to the inner side of the race m^{19} , will cause the sector m^{12} , referred to, to be turned in the direction of the arrow
125 on it in Fig. 13, thus throwing the point of the switch m^3 from the full to the dotted line position shown in Fig. 14. During this movement of the sector m^{12} , as just described, it will act to rotate the partial gear m^{13} , and by the
130 link m^{22} will turn the sector m^{14} , its shaft, and attached switch-point m^5 , and the sector m^{14}

will turn the partial gear m^{15} , the shaft m^{10} , and switch-point m^{17} , bringing them all into the dotted-line positions shown in Fig. 14.

The cam No. 2 has a groove, t , the shape of which is best shown in Fig. 15, the said cam-groove receiving in it a roller or other stud projecting from an arm of the harness-lever b , connected to the second harness-frame from the front.

The cam No. 3 has a groove, as t' , (best shown in Fig. 16,) it receiving in it a roller or other stud attached to an arm of the harness-lever c , connected in usual manner with the third harness-frame from the front.

The two cams No. 2 and No. 3 occupy always the same position with relation each to the other and the shaft moving them, and they operate the second and third harness frames in exactly the same time and order during the entire weaving of each pocket.

I do not herein desire to limit my invention to the exact shape of the harness-levers herein shown, and instead of the particular form of lever represented, known as "upright" levers, I may employ any other well-known or usual form of harness-levers which are connected with harness-frames, it only being necessary or essential that the levers used be provided with proper roller or other studs to be acted upon by the grooves of the cams referred to.

I have shown the pattern-wheel as deriving its movement from the devices instrumental in actuating the take-up, for thereby the pattern-wheel may be driven with fewer devices than were it actuated from the crank-shaft, and as the woven fabric has to be taken from the reed by the take-up rolls it has been found very convenient to employ the take-up rolls to move the pattern-wheel at the desired speed. The surface speed of the pattern-wheel with relation to the surface speed of the take-up rolls may be varied by changing the gear c^5 , and the respective lengths of the tubular part of the pocket and of the tubular part open at one side may be changed by making the arcs of the pattern-wheel longer or shorter with relation one to the other, the length of the solid part of the fabric constituting the bottom being determined by the distance between the shoulder o^1 and the shoulder o^3 .

In Fig. 5, which represents a portion of a piece of fabric for the production of pockets, the letter w designates the bottom of the pocket, the portion w' the tubular part of the pocket, and the portion w'' the tubular part open at one side, the tubular and open portions being well illustrated by the sectional views in Fig. 5.

I do not broadly claim in a loom the employment of a cam having a single switch, as such has been used in the manufacture of bags; and I also desire it to be understood that I may employ more than four harness-frames and harness-levers, according to the thickness which it is desired that the pocket fabric shall have.

In the weaving of the pocket the figures

above the horizontal lines in Figs. 2, 3, and 4 show the harness-frames that are elevated for certain picks, and those below the said line the harness-frames that are depressed for certain picks.

I have herein shown certain specific devices for automatically actuating the several sets of switches carried by the cams No. 1 and No. 4; but I do not desire to limit my invention to the exact form of devices represented for moving the said sets of switches, as instead I may use any other well-known or equivalent devices for moving the said sets of switches in the time and order and for the purposes herein described.

Referring to Fig. 9, the ends of the harness-frame are shown with the second harness-frame from the left elevated.

I claim—

1. A series of harness-frames, a series of shedding-levers, intermediate connections between the shedding-levers and harness frames, the shaft A^1 and means to rotate it, cams No. 2 and No. 3, secured to the shaft A^1 , and cams No. 1 and No. 4, each having two or more sets of switches adapted to be swung about their pivots, and with means to swing them about the said pivots to effect a change of position of the groove in the said cams, as described, with relation to the cams No. 2 and No. 3, but without changing the shape of the cams or their position on the shaft carrying them, substantially as described.

2. A series of harness-frames, a series of shedding-levers, intermediate connections between the shedding-levers and harness-frames, the shaft A^1 and means to rotate it, cams No. 2, No. 3, and No. 4, secured to the shaft A^1 , cam No. 4 having two or more sets of switches adapted to be swung about their pivots, and with means to swing the sets of switches about the said pivots, and cam No. 1, having four switches, h^{14} h^{15} h^{16} h^{17} , combined with means, substantially as described, to operate the said switches automatically.

3. A harness-frame, a shedding-lever, an intermediate connection between the shedding-lever and harness-frame, the shaft A^1 and means to rotate it, and cam No. 4, provided with four switches, m^3 m^4 m^5 m^6 , combined with means, substantially as described, to automatically operate the said switches in sets simultaneously to effect change in the weaving, as set forth.

4. The shedding-cam shaft A^1 , the cams No. 2 and No. 3, attached thereto, the cams No. 1 and No. 4, having each a series of switches, and means, substantially as described, to actuate the said switches, as set forth, combined with a series of harness-levers actuated by the said cams, and a series of harness-frames and connections between the said harness-frames and harness-levers, substantially as described.

5. The shaft A^1 , the cam No. 1, attached to it, the sector-lever h^{13} , provided with a cam, lug, or projection, combined with a switch-

point, as h^{10} , a raceway, as h^9 , and with means to actuate the said switch-cam, substantially as described.

6. The raceway h^9 , the switch-point h^{10} , the shaft h^8 , its crank-arm h^7 , and the pattern-wheel, combined with a lever actuated by the said pattern-wheel, and with intermediate devices between the said lever and the said crank-arm h^7 , substantially as described.

7. The pattern wheel, the cam No. 4, having a switch, m^3 , a sector connected to said switch and provided with a cam, lug, or projection, as m^{16} , a switch-point, m^{17} , shaft m^{18} , the crank-arm m^{21} , and raceway m^{19} , combined with a lever, m , actuated by the said pattern-wheel, and with devices, substantially as described, intermediate the said lever and the said crank-arm m^{21} to operate the switch-point m^{17} , as and for the purpose set forth.

8. The take-up roll C^2 , the pattern-wheel having portions of its periphery of different radii to determine the length of the tubular portion of the pocket and of the tubular portion open at one side and cut away to form the bottom of the pocket, gearing between the pattern-wheel and the take-up roll, combined with the levers m and h , the blocks m^{20} and h^{19} , the raceways m^{19} and h^9 on the said blocks, the

switch-points m^{17} and h^{10} , pivoted at one end of the raceways m^{19} and h^9 , respectively, and with intermediate mechanism, substantially as described, to automatically operate the said switch-points to cause the outer or inner side of the said raceways to be operative, substantially as set forth.

9. The pattern-wheel having radii of different length to leave portions 10 12, means to rotate the pattern-wheel, and a dog pivoted upon the pattern-wheel, combined with a cam and spring to operate the said dog as the pattern-wheel is rotated, substantially as described.

10. The pattern-wheel having radii of different length, as 10 12, a dog pivoted upon the pattern-wheel, and means to rotate the pattern-wheel, combined with a stationary cam, D, and a spring to operate the said dog as the wheel is rotated, 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,
C. M. CONE.