(No Model.) 3 Sheets—Sheet 1.

C. S. PECK.

MACHINE FOR DIPPING HATS.

No. 549,684. Patented Nov. 12, 1895.

Fig. 1.

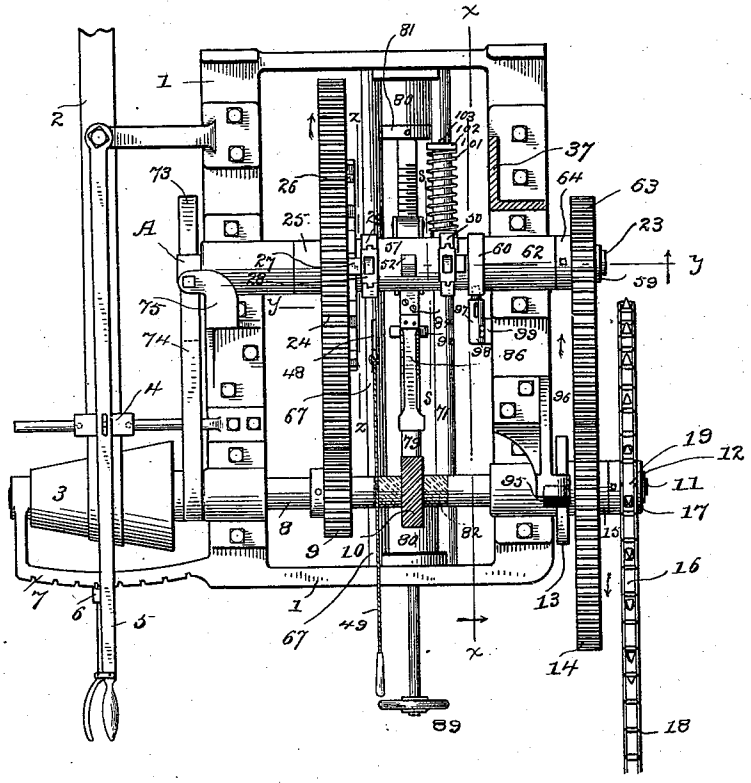
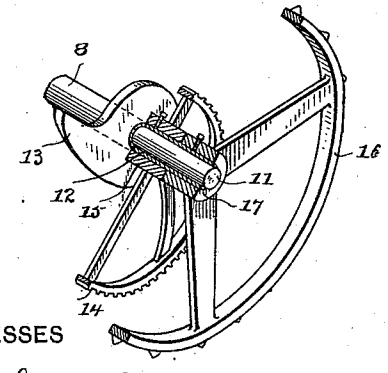
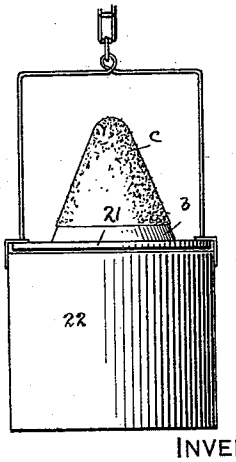


Fig. 2.





WITNESSES

H. A. Lamb

S. V. Richardson,

INVENTOR

Charles S. Peck

By A. Wooster

Atty.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 3.

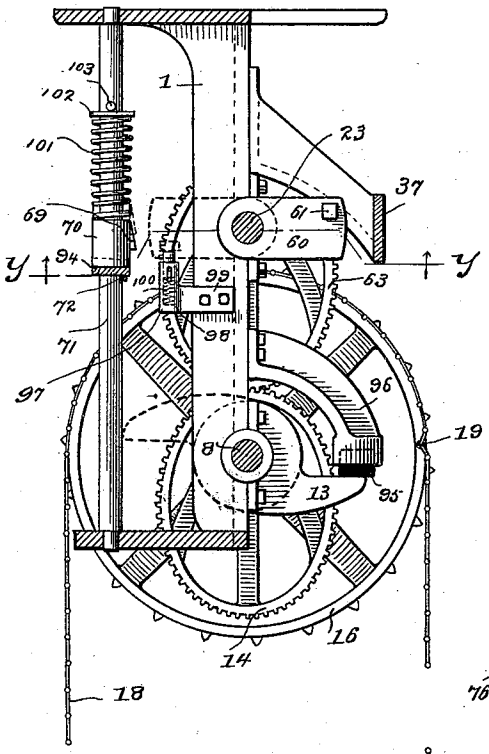


Fig. 4.

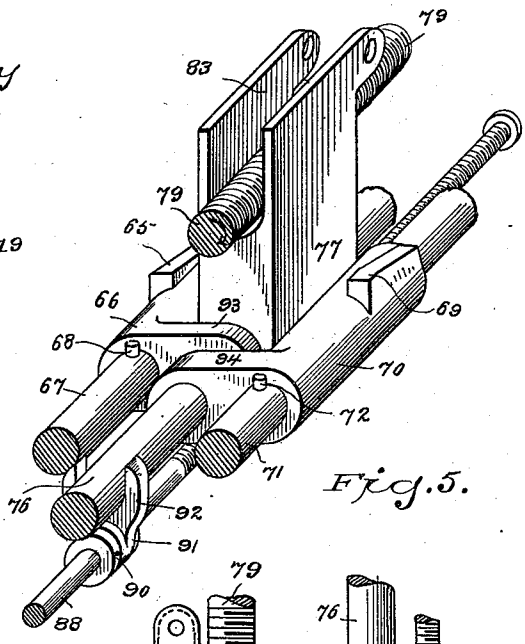
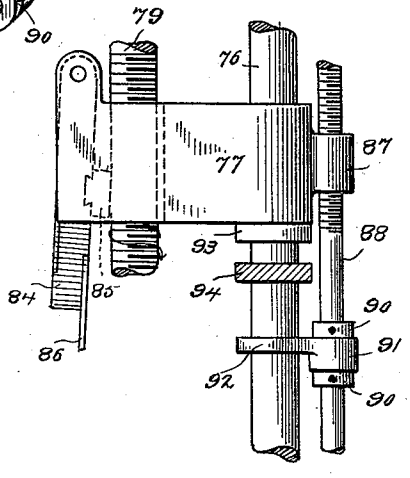
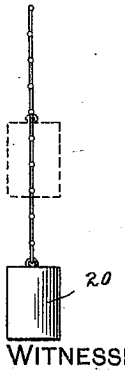
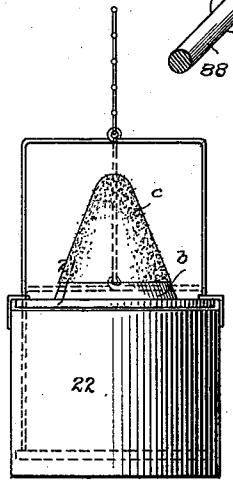


Fig. 5.







WITNESSES

H. A. Lamb.
S. V. Richardson.

INVENTOR

Charles S. Peck
By A. Wooster
Atty.

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Fig. 6.

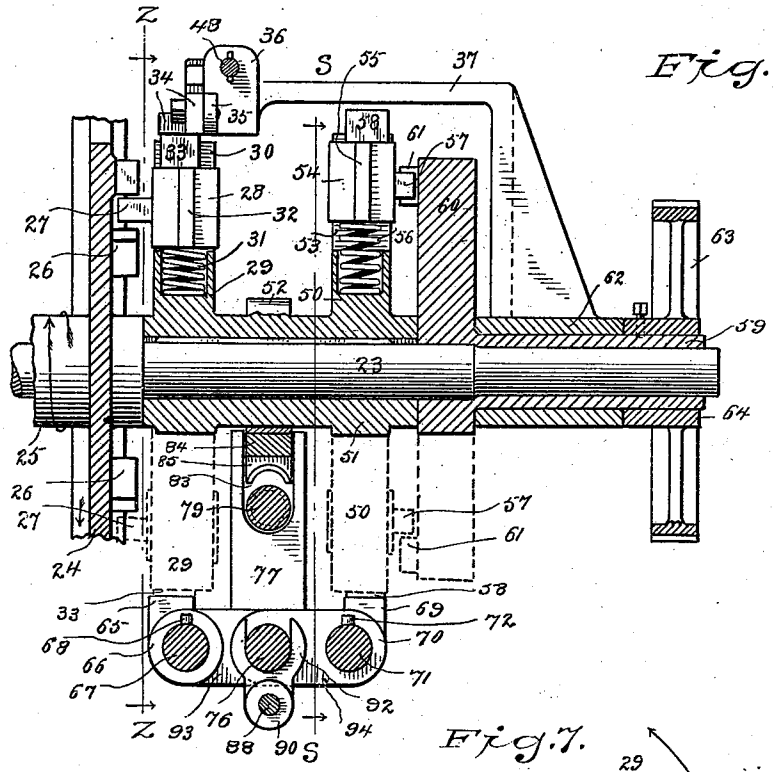


Fig. 7.

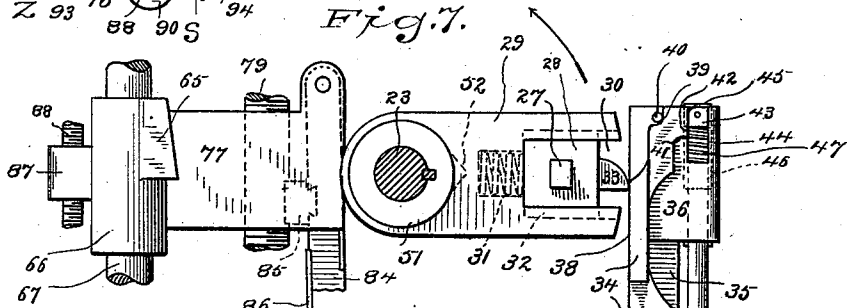
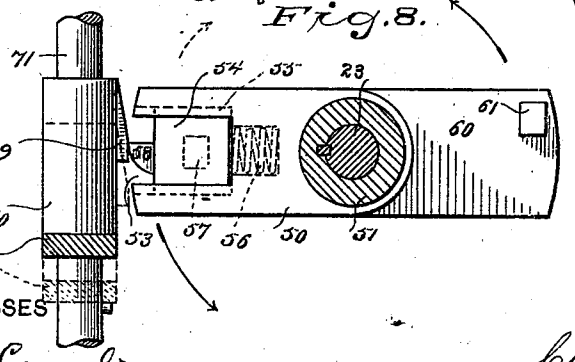


Fig. 8.



WITNESSES

H. A. Lamb

S. V. Richardson

INVENTOR

Charles S. Peck

By A. Wooster

Atty.

UNITED STATES PATENT OFFICE.

CHARLES S. PECK, OF DANBURY, CONNECTICUT.

MACHINE FOR DIPPING HATS.

SPECIFICATION forming part of Letters Patent No. 549,684, dated November 12, 1895.

Application filed March 29, 1895. Serial No. 543,688. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. PECK, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Machines for Dipping Hats; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the class of machines for dipping hats which is illustrated and described in my pending application for Letters Patent, Serial No. 525,238, filed October 8, 1894, and has for its general object to still further simplify and cheapen their construction and to improve their mode of operation in use, the special object of my present machine being to provide a construction especially adapted to certain classes of work—as, for example, in the manufacture of bonnets or fine hats in which it is desirable to have the upward movement of the carrier, cone, and hat-body take place at the greatest practicable speed. In order to accomplish the desired result I have devised a machine in which the downward movement of the carrier is produced by mechanism which is automatically disconnected from the driving mechanism at the end of the downward movement, permitting the upward movement to be performed very quickly by means of a weight, automatic mechanism being provided as in my said former application referred to for determining the length of time during which the body shall remain submerged.

My invention furthermore relates to various improvements in the details of construction which I will now proceed to describe, and then specifically point out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of the machine complete, with the exception that the bracket which carries the operating-rod is in section; Fig. 2, an enlarged detailed perspective, partially in section, illustrating the sleeve at the outer end of the main shaft which carries the dipping-wheel, a stop, and one of the elliptical gears; Fig. 3, a section on the line $x\,x$ in Fig. 1, looking toward the right; Fig. 4, a detail perspective, on an enlarged scale, illustrating the construction of the automatic mechanism which determines the length of time the body shall remain submerged; Fig. 5, a detail elevation, partially in section, of the mechanism illustrated in Fig. 4; Fig. 6, a section, on an enlarged scale, on the line $y\,y$ in Figs. 1 and 3, looking up; Fig. 7, a section on the line $z\,z$ in Figs. 1 and 6, looking toward the right; and Fig. 8 is a section on the line $s\,s$ in Figs. 1 and 6, also looking toward the right, shaft 23, however, having made a half rotation and the dipping mechanism been disconnected, Figs. 6, 7, and 8 illustrating the construction and operation of the mechanism for connecting and disconnecting shaft 23 and the dipping mechanism.

1 denotes a frame which may be of any ordinary or preferred construction and is usually adapted for attachment to the ceiling or to overhead beams. It may, however, if preferred, be supported by standards. (Not shown.) Power is applied to drive the machine by a belt 2 running over a cone-pulley 3 and passing through a belt-shifter 4 of ordinary construction.

5 denotes a shifting-lever which is provided with a latch 6, adapted to engage notches in a plate 7 to lock the belt-shifter and belt in operative position.

The use of a cone-pulley enables me to increase and decrease the speed of the machine by simply moving the shifting-lever in either direction, as may be required. The cone-pulley is carried by a shaft 8, which is suitably journaled in the frame, and is, in fact, the main shaft of the machine.

9 denotes a pinion and 10 a spiral gear on shaft 8. The opposite end of shaft 8 is reduced, as at 11, and carries a sleeve 12, which has formed integral with it a stop 13.

14 denotes an elliptical gear, whose hub 15 is rigidly secured to the sleeve—as, for example, by a set-screw—as shown in Fig. 2. Outside of the elliptical gear is the dipping-wheel 16, whose hub 17 is also rigidly secured to the sleeve. The dipping-wheel may or may not be a sprocket-wheel, as shown in the drawings.

18 denotes a sprocket-chain, which is secured at one place to the periphery of the dipping-wheel, as at 19 in Fig. 3. At one end

of the chain (a rope or cord may of course be substituted, if preferred) I attach a weight 20 and at the other end I attach the usual carrier 21, upon which the cones, with hat-bodies thereon, are placed for submersion in the tank, which is indicated by 22, the cone being indicated by *b*, and a hat-body thereto by *c*.

23 denotes a shaft, which is suitably journaled on the frame, in the present instance, above shaft 8.

24 denotes a large gear-wheel having a hub 25, which turns freely on shaft 23. This gear-wheel meshes with pinion 9, and is always turning when the machine is in use. The inner face of gear-wheel 24 is provided with crown teeth 26, which are adapted to be engaged by a lug 27 on a sliding block 28, carried by an arm 29, which is rigidly secured to shaft 23. I have shown this block as provided with ribs 32, which move in ways at the sides of a recess 30 in the arm and as moved forward by a spring 31, socketed in the recess below the block. (See Fig. 6.) Upon the outer face of the block is a rigid latch 33, which is adapted to engage a lever 34, pivoted to an arm 35, depending from a block 36, which is rigidly secured to or cast integral with a bracket 37, (see Fig. 6,) the latter being rigidly bolted to the frame, as shown in Fig. 1, in which the bracket appears in section. The special shape of this lever is, of course, not of the essence of my invention, the essential requirements being a surface 38 for engagement by latch 33, a notch 39, adapted to engage a pin 40, projecting outward from the block, a notch 41 and a surface 42, both of which are adapted to be engaged by a stump 43, which lies in a slot 44 in block 36, said stump projecting outward from a block 45, which is adapted to slide in a recess 46 in block 36, said block 45 being normally held at the raised position by a spring 47, socketed in recess 46 below the block. (See Fig. 7.)

48 denotes a rod connected to block 45, which I term the "operating-rod." This rod passes down through spring 47 and through block 36, and has attached thereto, in the present instance, a cord 49 for convenience in operation.

When it is desired to dip a hat-body, the operator is simply required to pull upon the operating rod or the cord, and from this instant the operation of the machine in lowering a hat-body into the tank, retaining it submerged for any required length of time, which is determined by adjustment, and raising the cone and hat-body, is wholly automatic, as will presently be fully explained.

The normal position of the parts just described is shown in Fig. 7. When the operator pulls down upon the cord, he moves block 45 downward far enough to permit spring 31 to move sliding block 28 forward, and places lugs 27 in engagement with crown-teeth 26 on the large gear-wheel latch 33 at the same time moving lever 34 forward until stump 43 lies in notch 41. The actual engaged position of the lug with the crown-teeth is not shown in the drawings, but will be readily understood from Fig. 6 and from Fig. 1, it being obvious from Fig. 6 that the forward movement of the lug will place it in engagement with the crown-tooth at the top, and Fig. 1 showing a position in which the engaging lug registers with a space between two crown-teeth from which position it would simply move forward toward the point of view in order to be in engagement with the teeth.

It will be noticed in Fig. 7 that notch 41 and stump 43 are both rounded, so that the instant latch 33 has passed off from lever 34 spring 47 will raise block 45, and stump 43 will pass out of notch 41 and will move the lever back to the position in which it is shown in said figure, the backward movement of the lever being stopped by pin 40, as clearly shown. The parts remain in this position until shaft 23 is started again by a pull upon the operating-cord.

50 denotes an arm similar in construction to arm 29 and likewise rididly attached to shaft 23. In the present instance I have shown these two arms as formed integral with a sleeve 51, which is keyed or otherwise secured to shaft 23. 52 denotes a cam on this sleeve, the purpose of which will presently be fully explained. Arm 50 is provided with a recess 53, which receives a sliding block 54, having ribs 55 engaging ways at the sides of the recess, and which is moved forward by a spring 56, socketed in the recess below the block. Block 54 is likewise provided with a lug 57 and a rigid latch 58, the functions of which will presently be fully explained.

59 denotes a sleeve on shaft 23, which is adapted to turn freely thereon and has formed integral therewith or rigidly secured thereto an arm 60, provided with a lug 61, which is adapted to be engaged by lug 57 on sliding block 54. The sleeve itself is journaled in a bearing on the frame, this end of the shaft being as a matter of fact journaled in the sleeve. The bearing is indicated by 62. At the outer end of the sleeve is an elliptical gear 63, whose hub 64 is rigidly secured to the sleeve—as, for example, by a set-screw. This gear meshes with elliptical gear 14, carried by sleeve 12, which itself rotates on the main shaft, designated as 8, the dipping-wheel, as already stated, moving with this gear.

The operation of this portion of my invention is as follows: The instant that lug 27 on sliding block 28 becomes engaged with the crown-teeth of the large gear-wheel, motion is imparted by means of arm 29 to shaft 23, sleeve 51, and arm 50. Lug 57 on sliding-block 54 now engages lug 61 on arm 60 and carries sleeve 59, and with it elliptical gear 63, forward with it against the power of the weight, the effect of which is to lower the carrier and with it the cone and hat-body into

the tank. So far as the dipping mechanism itself is concerned, this motion may be transmitted in any suitable manner, as by a pinion on each shaft meshing with a pinion of equal size on the other shaft. I prefer, however, that the carrier for the cone and hat-body shall move downward with a gradually retarded movement. By the term "retarded" I mean that the downward movement commences at the maximum speed and gradually grows slower to the end of the movement, so that there shall be no danger whatever of forcing the air within the body through it violently, so as to rupture or injure the body. In Figs. 1 and 3 the parts are shown at the normal position—that is, with the carrier at the raised position and having a cone and hat-body thereon. It will be noticed that at the starting-point the long radius of elliptical gear 63, which is the driving-gear, registers with the short radius of elliptical gear 14, which is the driven gear, and that as the movement proceeds the operative radius of the driving-gear will constantly grow shorter and the operative radius of the driven gear will constantly grow longer, thus producing a constantly-retarded movement of the driven gear and driven shaft and with it, of course, the dipping-wheel and carrier. At the instant the carrier reaches the lowered position in the tank, the movement is stopped in the manner I will now describe.

When the carrier is in this position, arms 29, 50, and 60 will be at the position shown in dotted lines in Fig. 6, (see also Fig. 3,) which shows the dotted position of arm 60, and also of stop 13 on sleeve 12. At this instant latch 33 on sliding block 28 will have engaged a cam 65 on a sliding collar 66 on a rod 67, the respective ends of which are rigidly secured in the frame, as indicated in Fig. 1, the downward movement of collar 66 on the rod being limited by a pin 68. The effect of the engagement of latch 33 with cam 65 will be to force the latch and with it the sliding block and engaging lug backward, as clearly indicated by dotted lines in Fig. 6, and will move said lug out of engagement with the crown-teeth on the large gear-wheel, thus instantly stopping the rotation of shaft 23, in which position the carrier with the cone and hat-body thereon will be wholly submerged. The carrier, cone, and hat-body will remain in this position until they are raised in a manner I shall presently describe, and shaft 23 and arms 29 and 50 will remain stationary until lug 27, on sliding-block 28, is again placed in engagement with the crown-teeth on the large gear-wheel, as will be fully explained. In order to insure that shaft 23 will be locked in position instantly when it has completed each half-rotation, I ordinarily provide suitable stop mechanism, which as a whole I have indicated by A in Fig. 1. The stop mechanism I preferably use consists of a plate 73 at the end of shaft 23, which is provided on opposite sides with notches (not shown) adapted to be engaged by a roller (not shown) carried by an arm 74, which in the present instance is pivoted on shaft 8. The roller is held in engagement with the periphery of the cam and is forced into the notches by a spring (not shown) carried by a bracket 75, rigidly secured to the frame. I have not deemed the stop mechanism to require explanation in detail, for the reason that stop mechanism is not essential, and if used any stop mechanism will serve the purpose, although I preferably use the stop mechanism illustrated and described in my said former application referred to.

As already stated, the parts are shown at the normal position in Figs. 1 and 3. Stop 13, which is fixed to sleeve 12, which also carries the dipping-wheel, now rests against a cushion 95, carried by a bracket 96, bolted to the frame. At the completion of the half-rotation of shaft 23, just described, stop 13 will be in the position indicated by dotted lines in Fig. 3, and arm 60, carried by shaft 23, will also be in the position indicated by dotted lines in said figure. As arm 60 approaches the extreme of its movement in this direction, it engages a starting device 97, in the present instance a plunger, the lower end of which is socketed in a block 98, carried by a bracket 99, bolted to the frame. A spring 100, lying under the plunger, acts to move it to the raised position. This starting device may or may not be used. I find it desirable, however, when stopping mechanism—such, for example, as the mechanism I have indicated by A—is used to lock shaft 23 in position at the end of each half-rotation to use a spring or a spring-actuated plunger to start arm 60 on its return movement when it is released, as I shall presently describe. It will be understood that arm 60 presses the plunger down against the power of the spring, and that when the arm is released the resiliency of the spring will act to start the arm quickly on the return movement.

Turning now to Fig. 4, but referring also to Figs. 3 to 8, inclusive, I will describe the manner in which the carrier with the cone and hat-body thereon are returned to the normal position, and also the manner in which shaft 23 is again connected with the large gear-wheel and carried forward thereby and again disconnected therefrom at the end of the second half-rotation, the parts being then again at the normal position and ready to receive another cone and hat-body to be dipped.

69 denotes a cam on a sliding collar 70 on a rod 71, the respective ends of which are secured in the frame, as indicated in Fig. 1, the downward movement of collar 70 on the rod being limited by a pin 72. This cam is adapted to be engaged by latch 58 on sliding block 54, as I shall presently explain.

76 denotes a rod, the respective ends of which are rigidly secured in the frame, and 77 a block adapted to slide thereon. 79 denotes a screw-shaft, the ends of which are

journaled in hubs 80, themselves rigidly secured to the frame.

81 is a collar on the screw-shaft, which bears against the upper hub to prevent upward movement of the shaft, and 82 is a spiral gear on said shaft, which rests upon the lower hub and meshes with spiral gear 10 on shaft 8, by which the screw is kept continually in rotation when the machine is in use. The spiral gear on screw-shaft 79 is shown only in dotted lines in Fig. 1, the entire construction, however, being fully illustrated and described in my said former application referred to. At the outer end of block 77 is a recess 83, through which screw-shaft 79 passes, but without contact therewith. Pivoted in this recess is a lever 84, which carries a block 85, the face of which is threaded to correspond with the thread of the screw-shaft. A spring 86 acts to hold the threaded block normally out of engagement with the thread of the screw-shaft, as indicated in Fig. 1. (See also Figs. 5 and 7.) At the completion of the half-rotation of shaft 23 the back of lever 84 will be engaged by cam 52 on shaft 23, and block 85 will be forced forward thereby against the power of the spring and placed in engagement with the thread of the screw-shaft. The normal position of the cam relatively to the lever is indicated by dotted lines in Fig. 7. The operative position of block 85 is not shown, it being deemed unnecessary to describe this portion of the mechanism in detail for the reason that it is fully illustrated and described in my said former application referred to. It is sufficient to say that at the completion of each half-rotation of shaft 23 and the parts carried thereby cam 52 will force lever 84 inward and will place the threaded block in engagement with the thread of the screw-shaft. As the screw-shaft is continually in rotation, it is obvious that when the threaded block is in engagement therewith the rotation of said shaft in the direction indicated by arrows in Figs. 4 and 5 will raise block 77 on rod 76, by which it is carried.

87 denotes a lug projecting outward from block 77 and which is engaged by a rod 88, a portion of which is threaded. At the lower end of this rod is a hand-wheel 89 for convenience in operation. 90 denotes collars on said rod, which are secured thereto in any suitable manner and which retain between them a collar 91, not secured to the rod, said collar 91 carrying a yoke 92, which partially incloses rod 76. It will be obvious that rotation of rod 88 will raise or lower said rod through the engagement of the thread thereon with lug 87 on block 77, and will consequently raise yoke 92 relatively to the block. Sliding collar 66 is provided with an arm 93, having an opening through which rod 76 passes freely, and sliding collar 70 is provided with an arm 94, also having an opening through which rod 76 passes freely.

The operation of this portion of the machine is as follows: When the rotation of shaft 23 causes cam 52 to engage lever 84 and place the threaded block in engagement with the screw-shaft, block 77 and with it rod 88 and yoke 92 will be moved upward thereby, said yoke first engaging arm 94 on sliding collar 70 and raising said arm and with it the collar and cam 69. As the cam is moved upward, it engages latch 58, (see dotted lines Fig. 6, also Fig. 8,) and moves sliding block 54 and with it lug 57 backward against the power of the spring. In Fig. 6 I have shown in dotted lines the position of lug 57 when moved backward, the lug being shown as moved inward past lug 61 on arm 60, thus releasing the arm. The instant the arm is released weight 20 will act to return the dipping-wheel, carrier, &c., to the normal position. This return movement of the carrier takes place very quickly, as the instant the release takes place the starting device acts upon arm 60 to start it forward, and the weight is made sufficiently heavy to more than overcome the weight of the carrier and cone. Just before the end of the upward movement is reached the weight comes in contact with a stop (not shown)—as, for example, the floor which stops the action of the weight upon the dipping-wheel. An instant later the upward movement of the carrier is stopped by the engagement of stop 13 with cushion 95. After the release of arm 60, through the engagement of latch 58 with cam 69, yoke 92 will continue to move upward, carrying collar 70 and arm 94, until the latter engages arm 93 on sliding collar 66 and carries said arm and with it collar 66 and cam 65 upward also. This movement raises cam 65 out of engagement with latch 33 and permits lug 27, on sliding block 28, to again engage the crown-teeth on the large gear-wheel, thus again communicating motion to shaft 23. The instant shaft 23 commences to move again cam 52 on said shaft passes out of engagement with lever 84 and spring 86 moves the threaded block out of engagement with the screw-shaft. This, of course, releases block 77 and permits it to drop down on rod 76 until it is stopped by arm 93 on sliding collar 66. It will be readily understood from the description already given that until cam 69 on sliding collar 70 is raised sufficiently to disengage lug 57 from lug 61 the hat-body, which has been lowered into the tank, will remain submerged. The length of time that the body remains submerged will depend, of course, upon the adjustment of yoke 92, which is carried by rod 88, it being apparent that if said yoke is raised high enough, so that it will engage arm 94 an instant after latch 33 is moved back by cam 65 and engaging-lug 27 thrown out of engagement with the crown-teeth, the upward movement of the hat-body will commence immediately, and that just as long a period of submersion as may be required can be obtained by rotating rod 88 and moving yoke 92 downward, where it will remain until readjusted,

it being, of course, understood that collars 90 rotate with the rod, so that the rod turns freely in collar 91, which carries the yoke.

It will be noticed in Fig. 5 that in the normal position of the parts there is a little space between arms 94 and 93. This space is not essential, although in practice I preferably place these arms a short distance apart on rod 76, so that a brief period of time will elapse after the release of arm 60, during which time arm 60 will return to its normal position and the carrier, cone, and hat-body will be raised before the second half-rotation of shaft 23 will commence. During the time that elapses after the carrier has reached its normal position, and before the second half-rotation of shaft 23 is completed, the operator removes the cone and hat-body from the carrier and places another thereon ready to be dipped, thus effecting a great saving in time and allowing the cones with the hat-bodies thereon to be handled much faster than has heretofore been possible, the upward movement being almost instantaneous, and the entire operation of dipping a hat consuming but little time in excess of the time required for the downward movement and the time during which the body remains submerged. The movement of shaft 23, which commences the instant engaging-lug 27 passes the second time into engagement with the crown-teeth on the large gear-wheel, will continue until the second half-rotation of this shaft is completed and latch 33 has engaged surface 38 on lever 34 and been moved backward, thereby carrying the engaging-lug out of engagement with the crown-teeth, as will be clearly understood from Figs. 6 and 7, (which see in connection with Fig. 1,) and stopping the machine the instant the second half-rotation is completed, the carrier with the cone and hat-body thereon being now at the raised position, as has already been fully explained.

It is believed that the operation of the machine as a whole will be clearly understood from the description of the several mechanisms. A general description of the operation is therefore not thought to be required, it being sufficient to say that having started the machine by a pull upon the operating-cord the first half-rotation of shaft 23 is automatically stopped by the engagement of latch 33 with cam 65, which disconnects the shaft from the large gear-wheel. This half-rotation of the shaft will have lowered the carrier and with it a cone and hat-body into the tank—in the present instance with a retarded movement—the sleeve carrying the dipping-wheel being connected by gears with an arm 60, journaled on shaft 23, and said arm being connected to the shaft by a lug 57, which engages lug 61 on sliding block 54, which also carries latch 58. At a predetermined time cam 69 is moved upward by yoke 92 and engages latch 58, forcing the block backward and disengaging arms 60 from the shaft. The weight now returns the dipping-wheel and carrier to the normal position, the upward movement of the carrier being stopped by the engagement of stop 13 with cushion 95, the length of time that the hat-body on the cone remains submerged being determined by the adjustment of the yoke on the rod by which it is carried. The second half-rotation of shaft 23 is automatically stopped by the engagement of latch 33 with lever 34, which again disconnects shaft 23 from the large gear-wheel. The parts are now at the normal position. All the operator is required to do to dip a hat-body is to place a cone with a body thereon on the carrier and pull the operating-cord, the entire operation of dipping being automatic.

I claim—

1. In combination a dipping wheel, a carrier for hat bodies suspended therefrom, a weight also suspended from the dipping wheel, a pivoted arm 60, connecting mechanism intermediate said arm and the dipping wheel, and mechanism by which arm 60 is carried forward to lower the carrier and then released so that the weight will return both the carrier and the arm to their normal positions.

2. In combination a dipping wheel, a carrier for hat bodies suspended therefrom, a weight also suspended from the dipping wheel, a pivoted arm 60, connecting mechanism intermediate said arm and the dipping wheel whereby the latter is rotated to lower the carrier with a retarded movement and mechanism by which arm 60 is carried forward and then released so that the weight will return both the carrier and the arm to their normal position.

3. In combination shafts 8 and 23, means for communicating motion from shaft 8 to shaft 23 and for disconnecting said shafts, sleeve 12 journaled on shaft 8 and carrying a gear wheel and the dipping wheel, a weight suspended from the dipping wheel, sleeve 59 journaled on shaft 23 and carrying an arm 60 and a gear wheel meshing with the gear wheel on sleeve 12, means for connecting arm 60 with shaft 23 so that the dipping wheel is rotated to lower the carrier, and means for automatically disconnecting arm 60 from shaft 23 at a predetermined time so that the weight will act to turn the dipping wheel backward and return the carrier to the normal position.

4. In combination shafts 8 and 23, means for communicating motion from shaft 8 to shaft 23 and means for disconnecting shaft 23 from shaft 8, sleeve 12 journaled on shaft 8 and carrying an elliptical gear wheel and the dipping wheel, a weight suspended from the dipping wheel, sleeve 59 journaled on shaft 23 and carrying arm 60 and an elliptical gear wheel meshing with the elliptical gear wheel on sleeve 12, means for connecting arm 60 with shaft 23 so that the dipping wheel is rotated to lower the carrier with a gradually retarded movement substantially as set forth and means for automatically disconnecting arm 60 from shaft 23 at a predetermined time so that the weight will

act to turn the dipping wheel backward and return the carrier to the normal position.

5. In combination shaft 8 carrying a pinion 9, shaft 23 having a gear wheel 24 journaled thereon which meshes with pinion 9, means for connecting shaft 23 with said gear wheel and for disconnecting the shaft at the end of each half rotation of said shaft, sleeve 12 journaled on shaft 8 and carrying a gear wheel 14 and the dipping wheel, sleeve 59 journaled on shaft 23 and carrying arm 60 and a gear wheel 63 meshing with gear wheel 14, means for connecting arm 60 with shaft 23 so that the dipping wheel is rotated to lower the carrier and means for automatically disconnecting arm 60 from shaft 23 at a predetermined time as and for the purpose set forth.

6. In combination shaft 8 carrying a pinion 9, shaft 23 having a gear wheel 24 journaled thereon and meshing with pinion 9, said gear wheel having crown teeth 26, arm 29 moving with shaft 23 and carrying a spring actuated block 28 provided with a latch 33 and a lug 27 adapted to engage the crown teeth, sleeve 12 journaled on shaft 8 and carrying a gear wheel 14 and the dipping wheel, sleeve 59 journaled on shaft 23 and carrying an arm 60 and a gear wheel 63 meshing with gear wheel 14, means for connecting arm 60 with shaft 23 so that the dipping wheel is rotated with said shaft to lower the carrier, and a cam 65 which is engaged by the latch to disengage the lug from the crown teeth at the end of a half rotation of shaft 23 and means for disconnecting arm 60 from shaft 23 at a predetermined time as and for the purpose set forth.

7. In combination shaft 8 carrying a pinion 9, shaft 23 having a gear wheel 24 journaled thereon and meshing with pinion 9, means for connecting shaft 23 with the gear wheel and for disconnecting said shaft at the end of each half rotation of said shaft, arm 50 moving with shaft 23 and carrying a spring actuated block 54 provided with a latch 58 and a lug 57, sleeve 12 journaled on shaft 8 and carrying a gear wheel 14 and the dipping wheel, a weight suspended from the dipping wheel sleeve 59 journaled on shaft 23 and carrying an arm 60 having a lug 61 adapted to be engaged by lug 57 and a gear wheel 63 meshing with gear wheel 14 and a cam 69 which is adapted to engage the latch at a predetermined time and disengage lug 57 from lug 61 thereby releasing the dipping wheel and permitting the weight to turn the latter backward to return the carrier to the normal position.

8. The combination with a dipping wheel, a carrier suspended therefrom, a weight also suspended from the dipping wheel, and acting to return the carrier to its normal position and a gear wheel 14 moving with the dipping wheel, of shaft 23, gear wheel 24 journaled thereon, mechanism for disconnecting said shaft at the end of each half rotation, arm 50 moving with said shaft and carrying a spring actuated block 54 provided with a latch 58 and a lug 57, sleeve 59 journaled on said shaft and carrying an arm 60 having a lug 61 adapted to be engaged by lug 57 and a gear wheel meshing with gear wheel 14, cam 69 adapted to engage latch 58 to disengage lug 57 from lug 61 for the purpose set forth and vertically movable yoke 92 by which the cam is actuated.

9. The combination with shaft 23 and arm 60 journaled thereon, of wheel 24 also journaled on said shaft, mechanism intermediate said wheel and said arm whereby said shaft is connected with the wheel and a half rotation imparted to said shaft and said arm, mechanism for automatically releasing said arm at a predetermined time, mechanism for returning said arm to its normal position and mechanism for again connecting said shaft with the wheel and for disconnecting said shaft when the wheel is at the normal position.

10. The combination with the dipping wheel, the carrier and weight suspended therefrom, the latter acting to return the carrier to its normal position, arm 60, connecting mechanism intermediate said arm and the dipping wheel, and shaft 23 on which said arm is journaled, of wheel 24 also journaled on said shaft, mechanism intermediate said wheel and said arm whereby said shaft is connected with the wheel and a half rotation imparted to said shaft and said arm, mechanism for automatically disconnecting said arm at a predetermined time, for the purpose set forth, and mechanism for automatically connecting said shaft with the wheel a second time and for disconnecting said shaft at the end of the second half rotation.

11. The combination with shaft 23 and arm 60 journaled thereon and provided with a lug 61, of wheel 24 also journaled on said shaft and provided with crown teeth 26, mechanism intermediate said crown teeth and said lug whereby said shaft is connected with the wheel and a half rotation imparted to said shaft and said arm, mechanism for automatically releasing said arm at a predetermined time and mechanism for automatically connecting said shaft with the crown teeth and for disconnecting said shaft when the parts are at the normal position.

12. The combination with shaft 23, arm 60 journaled thereon and provided with a lug 61, and a wheel 24 also journaled on said shaft and provided with crown teeth, of sleeve 51 rigidly secured to said shaft and carrying arms 29 and 50, a sliding block 28 in arm 29 having a latch 33 and a lug 27 adapted to engage the crown teeth, a sliding block 54 in arm 50 having a latch 58 and a lug 57 adapted to engage lug 61, cam 65 adapted to be engaged by latch 33 to disconnect the sleeve from the crown teeth at the end of a half rotation of the shaft, a cam 69 adapted to engage latch 58 to disengage lugs 57 and 61 for the purpose set forth, and a vertically movable yoke 92 which is adapted to be adjusted to act on cam 69 and cause the release of the arm at a predeter-

mined time and then to act on cam 65 to release block 28 and permit lug 27 to again engage the crown teeth.

13. The combination with shaft 23, arm 60 journaled thereon and provided with a lug 61, and a wheel 24 also journaled on said shaft and provided with crown teeth, of sleeve 51 rigidly secured to said shaft and carrying arms 29 and 50, a sliding block 28 in arm 29 having a latch 33 and a lug 27 adapted to engage the crown teeth, a sliding block 54 in arm 50 having a latch 58 and a lug 57 adapted to engage lug 61, sliding collar 66 having an arm 93 and a cam 65 adapted to be engaged by latch 33 to disconnect the sleeve from the crown teeth at the end of a half rotation of the shaft, sliding collar 70 having an arm 94 and a cam 69 adapted to engage latch 58 to disengage lugs 57 and 61 for the purpose set forth, and a vertically movable yoke 92 which is adapted to engage arm 94 and actuate cam 69, continued movement of said yoke causing arm 94 to engage arm 93 and the latter to actuate cam 65 as and for the purpose set forth.

14. The combination with shaft 23, arm 60 journaled thereon and provided with a lug 61, and a wheel 24 also journaled on said shaft and provided with crown teeth, of sleeve 51 rigidly secured to said shaft and carrying arms 29 and 50, a sliding block 28 in arm 29 having a latch 33 and a lug 27 adapted to engage the crown teeth, a sliding block 54 in arm 50 having a latch 58 and a lug 57 adapted to engage lug 61, fixed rods 67, 71 and 76, collar 66 adapted to slide on rod 67 and having an arm 93 through which rod 76 passes and a cam 65 adapted to be engaged by latch 33 to disconnect the sleeve from the crown teeth at the end of a half rotation of the shaft, collar 70 adapted to slide on rod 71 and having an arm 94 through which rod 76 passes and a cam 69 adapted to engage latch 58 and disengage lugs 57 and 61 for the purpose set forth and a vertically movable yoke 92 which is adapted to engage arm 94 and actuate cam 69, continued movement of said yoke causing arm 94 to engage arm 93 and the latter to actuate cam 65 as and for the purpose set forth.

15. The combination with shaft 23 carrying cam 52 and arms 29 and 50, wheel 24 having crown teeth 26, and arm 60 having lug 61 journaled independently on said shaft, sliding block 28 in arm 29, said block having a lug 27 adapted to engage the crown teeth and a latch 33, and sliding block 54 in arm 50 having a lug 57 adapted to engage lug 61 and a latch 58, of sliding collar 66 having a cam 65 which when engaged by latch 33 moves sliding block 28 backward and disengages lug 27 from the crown teeth, sliding collar 70 having a cam 69 which when engaged by latch 58 disengages lugs 57 and 61, yoke 92, vertically adjustable rod 88 by which said yoke is carried, a block 77 by which said rod is carried, screw shaft 79 and a lever 84 carrying a threaded block 85 which is adapted to engage the screw shaft when the lever is moved inward by cam 52 whereby yoke 92 is moved upward and engages the sliding collars to actuate the cams as and for the purpose set forth.

16. The combination with a vertically movable carrier, a weight for returning said carrier to its normal position, shaft 23 carrying cam 52, wheel 24 and arm 60 independently journaled on said shaft, connecting mechanism intermediate the carrier and the arm, and means for connecting the shaft and the wheel at the beginning and for disconnecting them at the end of each half rotation, of cam 69 by which the shaft and arm are disconnected, screw shaft 79, vertically movable block 77, lever 84 pivoted to said block and carrying a threaded block engaging the screw shaft, vertically movable yoke 92 by which the cam is actuated and means for adjusting the yoke relatively to the cam, thus determining the time that must elapse after the threaded block has been moved into engagement with the screw shaft by cam 52 before the yoke will actuate cam 69 and disengage the arm and shaft which permits the weight to return the carrier to the normal position.

17. The combination with the dipping wheel, the carrier and weight suspended therefrom, arm 60, connecting mechanism intermediate said arm and the dipping wheel and shaft 23 on which said arm is journaled, of wheel 24 also journaled on said shaft, mechanism intermediate said wheel and said arm whereby said shaft is connected with the wheel and a half rotation imparted to said shaft and to arm 60, and the dipping wheel is rotated to lower the carrier, mechanism for automatically releasing said arm, and a spring starting device which is engaged by arm 60 when the carrier is at the lowered position and which acts when the arm is released to start said arm and the dipping wheel and carrier on the return movement.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES S. PECK.

Witnesses:
H. A. WILDMAN,
W. H. STEGEMAN.