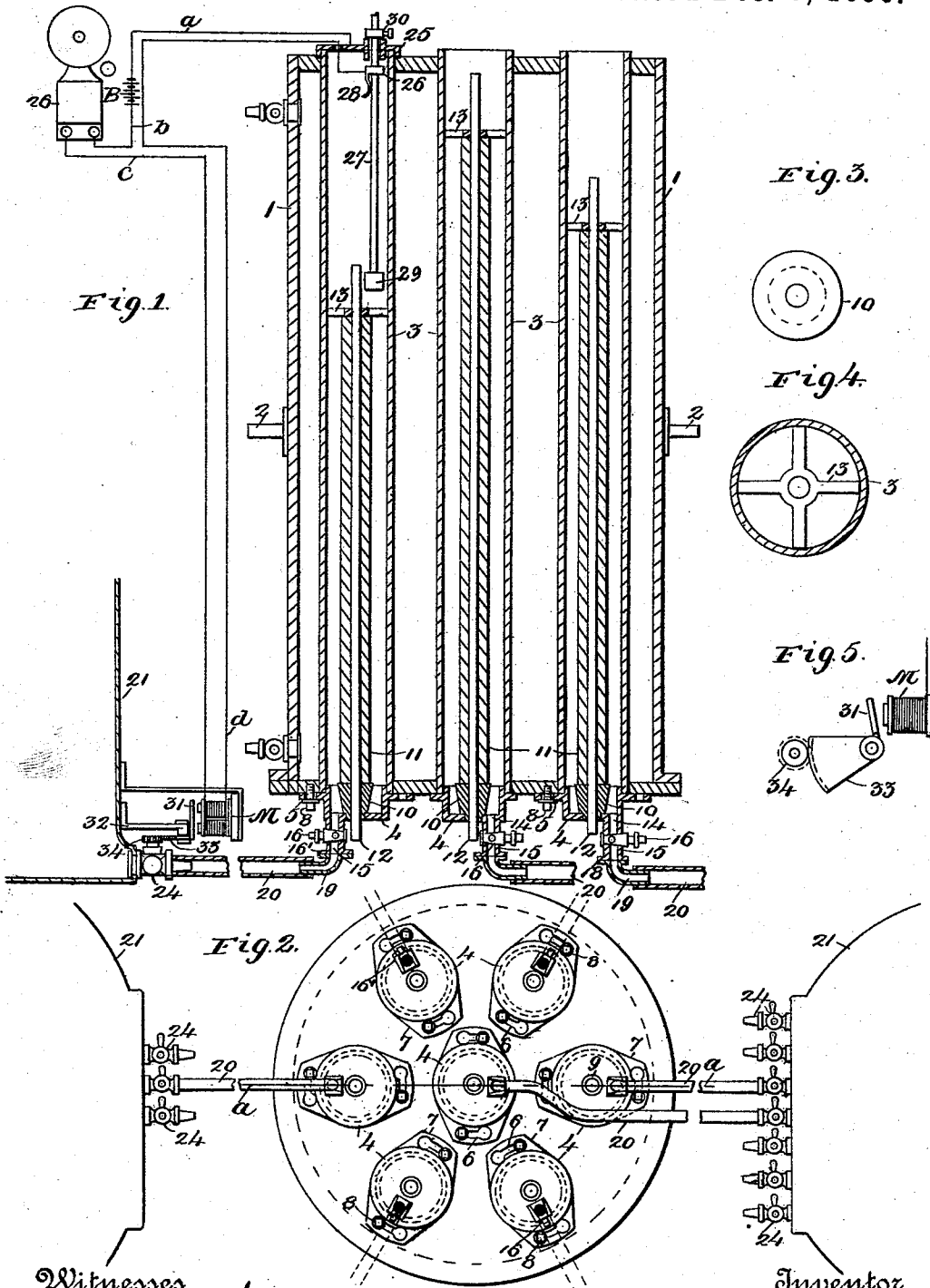


C. W. CRUTSINGER.
APPARATUS FOR CASTING PRINTERS' ROLLERS.

No. 572,744.

Patented Dec. 8, 1896.



Witnesses
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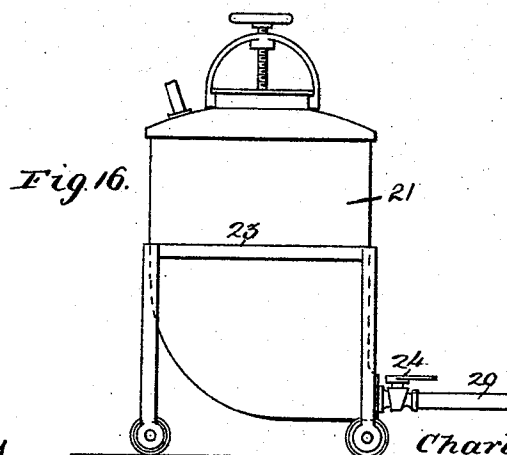
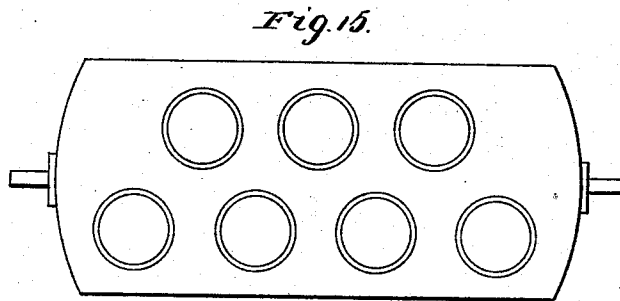
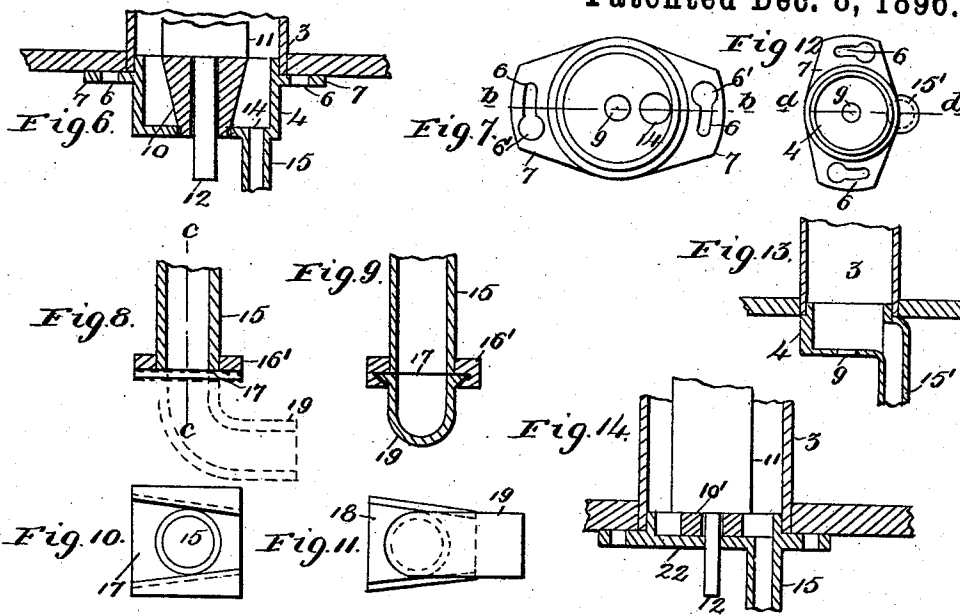
(No Model.)

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UNITED STATES PATENT OFFICE.

CHARLES W. CRUTSINGER, OF ST. LOUIS, MISSOURI.

APPARATUS FOR CASTING PRINTERS' ROLLERS.

SPECIFICATION forming part of Letters Patent No. 572,744, dated December 8, 1896.

Application filed August 15, 1896. Serial No. 602,872. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. CRUTSINGER, a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Apparatus for Casting Printers' Rollers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in apparatus for casting printers' rollers; and it consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a middle vertical section of the mold-receptacle, taken on the line *a a* of Fig. 2. Fig. 2 is a bottom plan view of the mold-receptacle, showing the connections to the supply-tank. Fig. 3 is a top plan view, enlarged, of the core-supporting plug. Fig. 4 is a plan of the mold-centering spider, showing the mold in section. Fig. 5 is a detail plan of the electrical cut-off mechanism for the cocks or valves of the composition-supply tank. Fig. 6 is a section on *b b* of Fig. 7, taken through the cup carried by the lower end of the mold. Fig. 7 is a bottom plan view of the cup. Fig. 8 is a detail section of the pipe leading to the cup and the elbow coupled thereto. Fig. 9 is a section on *c c* of Fig. 8. Fig. 10 is a bottom plan view of the bevel-guide coupling-plate forming the lower end of the pipe leading to the cup. Fig. 11 is a bottom plan view of the coupling end of the elbow adapted to be coupled to the coupling-plate carried by the pipe shown in Fig. 10. Fig. 12 is a bottom plan view of a modified form of cup. Fig. 13 is a section on *d d* of Fig. 12. Fig. 14 is a section of a modified form of cup, said modification being in the form of a plate. Fig. 15 is a top plan of a modified form of mold-receptacle, and Fig. 16 is an elevation of the preferred form of composition-supply tank.

The object of my invention is to construct an apparatus for the casting of printers' rollers singly or in clusters, the apparatus being so constructed as to enable the operator to fill the molds of a cluster with either the same or a different kind of composition at one and the same time and cooling all the molds simultaneously; to enable the operator to cast

different lengths of rollers in the same cluster without excessive heads or stopping off with plugs; to enable him further to fill any number of molds at pleasure without in any wise interfering with the unfilled molds; and to enable him to discharge the contents of the individual molds at any convenient time, avoiding the necessity and inconvenience of discharging the entire series at one time, as must be done with the old forms of cluster apparatus.

A further object is to so construct the cluster of molds whereby in the casting of the roller a minimum amount of composition will be trimmed from the finished roller, thereby materially economizing the material entering into the composition of any roller; and to economize labor, as by the present apparatus one man can fill and discharge a receptacle without assistance, as the weight of each plug or cup by which the bottom of each mold is closed is slight.

The construction of the present device is such that receptacles or cylinders now in use can be readily converted into the new system without material alteration of their essential parts.

The present apparatus is provided with a suitable electric indicator and cut-off mechanism by which the supply of the roller composition is shut off when a roller reaches a predetermined length and whereby an alarm is sounded to indicate that a roller has been cast.

The above advantages of the present system will be more clearly apparent from a detailed description of the apparatus, which is as follows:

Referring to the drawings, 1 represents a suitable mold-receptacle provided with trunnions 2, by which it may be mounted and about which it may be revolved on any suitable supporting-frame. (Not shown.) Disposed between the top and bottom of said receptacle is a series of molds 3, open at both ends, the upper end of each mold projecting slightly above the top of the receptacle and the lower end being substantially flush with the outer surface of the bottom of said receptacle.

The lower open end of each mold is adapted to be closed by a plate or cup 4, depending

(in the preferred form of construction) a suitable distance below the bottom, the upper edge of the cup being inserted a short distance into the mold and being held or secured to the bottom of the receptacle about the mold by means of the retaining-screws 5, carried by the bottom and projecting through the curved slots 6, cut in the flanges 7, forming a part of each cup, the flanges being adapted to bear against the outer surface of the bottom of the receptacle and being secured by first adjusting each cup so as to bring the enlarged diagonal ends 6' of the slots in alignment with the openings of the bottom of the receptacle designed to receive the screws, then driving the screws through the openings thus brought into alinement until the heads 8 of said screws are brought to bear against the outer surface of the flange, when, by giving the cup a sufficient turn or twist to bring the screws to the opposite ends of the slots, the said screws can be further driven home or screwed to bring their heads 8 firmly against the flange, whereby the latter will be firmly held to the bottom of the receptacle. The cups 4 are thus temporarily retained or clamped in place. The walls of the center opening 9 of each cup form a support for the plug 10, by which is carried the core 11 of the mold and through which passes the lower end of the rod 12, forming one of the gudgeons of the completed roller. The rod 12 passes through the core and projects beyond the ends of the same, (the opposite projecting end of the rod forming the opposite gudgeon for the roller,) passing also through the central opening of the spider 13, by which the core and rod 12, carried by it, are properly centered within the mold.

Communicating with an opening 14 at the base of the cup 4 is a pipe 15, provided with a cock or valve 16 for the admission of the liquid composition into the cup and mold. The base of the pipe 15 is provided with a flanged coupling-plate 16', which is provided adjacent to the open end of the pipe with inclined bevel-grooves, forming a wedge-shaped guideway 17. The said guideway is adapted to receive the beveled expanded upper end or flange 18 of the elbow or pipe 19.

It is apparent that by slipping the expanded end 18 into the guideway 17 from the wide end of the latter a ready and easy coupling or connection is effected between the pipes 15 and 19, it being understood that the uncoupling of these pipes is resorted to when occasion requires the removal of the cup from the bottom of the mold at which it is secured. The opposite end of the elbow 19 has secured thereto a flexible hose 20, leading to one of a series of cocks of a composition-supply tank 21.

Any number of supply-tanks can be employed, each with a different composition, whereby the several molds may be filled with different compositions at one or at different times and to different lengths of roller, or the several molds may be coupled to the same

tank and the different molds filled with the same composition to the same or different heights.

In reconstructing an old receptacle in which the individual molds are or may be of small diameter and where it would be impractical to secure a cup large enough to admit of two openings 9 14 in the bottom thereof I form for such a receptacle a cup with a lateral extension or tube 15', as seen in Figs. 12 and 13, to which the elbow 19 can be similarly coupled. In Fig. 14 I have shown a still further modification of cup in the shape of a plate 22, which rests directly on the bottom of the receptacle and which in lieu of the plug 10 supports a ring 10', on which the core is directly supported. The cups 4 (or plates 22) of course serve to temporarily plug up the lower open end of the mold to support the core in the mold and to serve as a means for attaching the pipes through which the composition is fed to the mold.

In Fig. 15 I have shown a modified form of receptacle, which, in the place of being cylindrical in form, is oblong in shape.

In Fig. 16, 23 represents the roller-supported frame by which the tank is carried, the cocks 24 thereof being arranged in the same straight line, so that any cock can be easily coupled to any one of the series of hose leading from the elbows 19. Such a tank too can be wheeled directly to the receptacle without inconvenience.

To indicate when the roller has been cast to the required length and to automatically cut off the supply of the composition from the supply-tank, I employ the following electrical cut-off mechanism and alarm:

B represents a battery, from one pole of which leads the wire *a* to the plate 25, forming the cover for the mold. From the opposite pole leads the wire *b* to an alarm-bell 26. Leading from the bell is a wire *c* to an electromagnet M, from which leads the return-current wire *d*, the same passing through a suitable opening in the plate or cover 25 and connecting with a metallic collar 26, which embraces the floating stem 27, the said collar being held in any adjusted position on said stem by means of the resiliency of the flexed spring-arm 28, forming a part of the collar and bearing against the stem. The stem passes loosely through the plate 25 and is guided by it and is supported from it by the adjustable collar or clamp 30, carried by the outer projecting end of the stem.

The position of the supporting-clamp 30 determines the position of the floating stem within the mold and the distance of the inner or expanded head 29 thereof from the centering-spider 13. When the composition fills the mold sufficiently to raise the floating stem to a position to effect electrical contact between the collar 26 and the guide-plate 25, the circuit from the battery will be closed and an alarm will be sounded, thus indicating that the particular roller has been cast and that

the composition has risen to the required height in the mold. At the same time that the current is closed the magnet becomes energized, attracting under those circumstances the armature 31, which latter forms one arm of a bell-crank pivoted to a bracket 32 of the supply-tank, the opposite arm of the bell-crank being in the shape of a toothed segment or arm 33, the teeth of which mesh with a pinion 34, carried by or forming part of the stem of any of the cocks or valves 24 leading from the supply-tank. By the tilting or rocking of the armature as a result of the energizing action of the current on the magnet the segment 33 is tilted sufficiently to turn the pinion 34 a distance to effect the closing of the valve of which it forms a part against the further influx of composition into the mold. The receptacle is provided with the usual inlet and outlet valves for the admission and escape of water used in the cooling of the molds after the rollers have been cast.

From the foregoing it is apparent that one man can readily handle the apparatus. Any roller after being cast can be readily withdrawn by the removal of the cup by which the lower end of the mold is covered and by which the core of the mold is always properly centered without the use of a bottom spider. The different molds can be filled to any predetermined height. Any number of molds can be operated on independently of the remaining molds of the series. Any kind of composition can be turned into any one or all the molds and to any desired height. All the molds can be cooled simultaneously irrespective of the length of the roller cast or character of the composition entering into it, and on the whole the present system presents all the advantages enumerated in the foregoing part of this specification.

It is apparent, of course, that many minor changes might be made in construction without departing from the spirit of my invention.

One of the distinguishing features of the present apparatus is that each roller when cast can be removed from its mold without the necessity of trimming any of the composition (and thus roughening the surface of one end of the roller) from which it was cast. In the old form of apparatus, where clusters have been cast by composition entering all the molds from a chamber above a single bottom plate, a portion of such composition—viz., that remaining in the bottom chamber after the casting operation—forms an integral part of the composition making up the several rollers, which to be removed singly have to be first trimmed from the bottom layer of composition referred to, and in withdrawing the roller through the opening thus formed in the bottom layer of composition from which the roller was trimmed there is danger of roughening the outer surface of the roller, which under ordinary circumstances is always smooth when cast, and the only condition under which the rollers cast in the old

form of apparatus can be withdrawn without subjecting their outer smooth surface to the roughening referred to is to withdraw them all at one time, a disadvantage which I totally avoid by being able to withdraw each roller singly and independently of any other roller of the cluster.

Having described my invention, what I claim is—

1. In an apparatus for casting printers' rollers, a suitable mold-receptacle, a series of molds open at both ends disposed therein, a detachable plate for temporarily closing the bottom of each mold, a suitable inlet-pipe communicating with each plate, whereby the molds can be filled either singly and simultaneously, or at different times, and rollers of variable lengths and of different or the same composition can be cast simultaneously or independently, the said plate serving to support and center the lower end of the core inserted in each mold, and means for centering and supporting the opposite end of the core within the mold, substantially as set forth.

2. In an apparatus for casting printers' rollers, a suitable mold-receptacle, a series of molds open at both ends disposed therein, a detachable plate temporarily closing the bottom of each mold, each plate having a suitable inlet-opening whereby the molds can be filled either singly and simultaneously, or at different times, and rollers of variable lengths and of different or the same composition can be cast simultaneously, or independently and at different times, and whereby upon removal of the plates the rollers can be removed singly, a central opening formed in the base of each plate, a plug inserted in said opening, a core supported directly on said plug, a rod passing through the core and having its projecting end passed through the plug whereby the lower end of the core is properly centered within the mold, a spider for centering the upper end of the core within the mold, substantially as set forth.

3. In an apparatus for casting printers' rollers, a suitable mold-receptacle, a series of molds disposed therein, a detachable independent plate adapted to temporarily close the bottom of each mold, means carried by the plate for centering the lower end of the core in the mold and supporting the same, a series of composition-supply tanks, and pipe connections between the supply-tanks and the detachable plates, whereby the molds can be filled either simultaneously, or independently and at different times, and rollers of variable lengths and of different or the same composition can be cast simultaneously, or independently and at different times, and be removed singly, substantially as set forth.

4. In an apparatus for casting printers' rollers, a suitable receptacle, a series of molds disposed therein, a float loosely supported from the top of each mold, a plate for guiding said float, a suitable electric circuit, an alarm or indicator forming a part of the circuit, said

- float being adapted to close the circuit for a predetermined height of the composition in the mold, a suitable valve or cock for the admission of the composition into the mold, and intermediate connections between said cock or valve and the electric circuit for controlling the cock and cutting off the composition upon the closing of the circuit, substantially as set forth.
5. In an apparatus for casting printers' rollers, a suitable receptacle, a series of molds disposed therein, an inlet-pipe for the bottom of each mold, a composition-supply tank, pipe connections between the inlet-pipe to the mold and the said supply-tank, a float depending a suitable distance into each mold, a guide-plate for guiding said float, an electric circuit adapted to be closed by the float for any predetermined elevation or height of the composition in the mold, an energizing-magnet forming a part of the circuit, a tilting lever one arm of which constitutes the armature for said magnet, the second arm of said lever having a series of ratchet-teeth, a pinion meshing with said ratchet, said pinion cooperating with the stem of the valve leading from the supply-tank, whereby upon the closing of the circuit the supply of composition from the tank is shut off, substantially as set forth.
6. In an apparatus for casting printers' rollers, a suitable cup having outwardly-extending flanges adapted to be secured to the bottom of the receptacle below the opening of the molds of the same, a curved slot having an enlarged end formed along each flange, a screw projecting from the bottom of the receptacle and adapted to be passed through

the slot of each flange, a retaining-head for each screw, a central opening formed in the base of each cup for the passage of the guide of the roller, a pipe leading into said cup for delivering composition into the same, a flanged coupling-plate carried at the bottom of the said pipe, inclined grooves formed in said plate the said grooves forming jointly a beveled guideway, an elbow having an enlarged upper end or flange beveled to correspond to the guideway carried by the pipe leading to the cup, whereby a ready coupling is effected between the elbow and the pipe leading to the cup, and suitable pipe connections between the elbow and the supply-tank for the mold, substantially as set forth.

7. In an apparatus for casting printers' rollers, a suitable receptacle, a series of molds open at both ends disposed therein, a detachable plate for temporarily closing the bottom of each mold, a pipe leading to each plate for admitting composition into the mold, whereby the several molds can be filled simultaneously, or independently at different times with the same or different composition to the same or variable heights, and the several rollers removed singly and without material trimming, one or more supply-tanks, and suitable pipe connections between any supply-tank and one or more of the plates leading to the molds, substantially as set forth.

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

CHARLES W. CRUTSINGER.

Witnesses:

ALFRED A. MATHEY,
EMIL STAREK.