(No Model.) 3 Sheets—Sheet 1.

R. G. GUPTILL.

GLASS PIPE CASTING MACHINE.

No. 438,807. Patented Oct. 21, 1890.

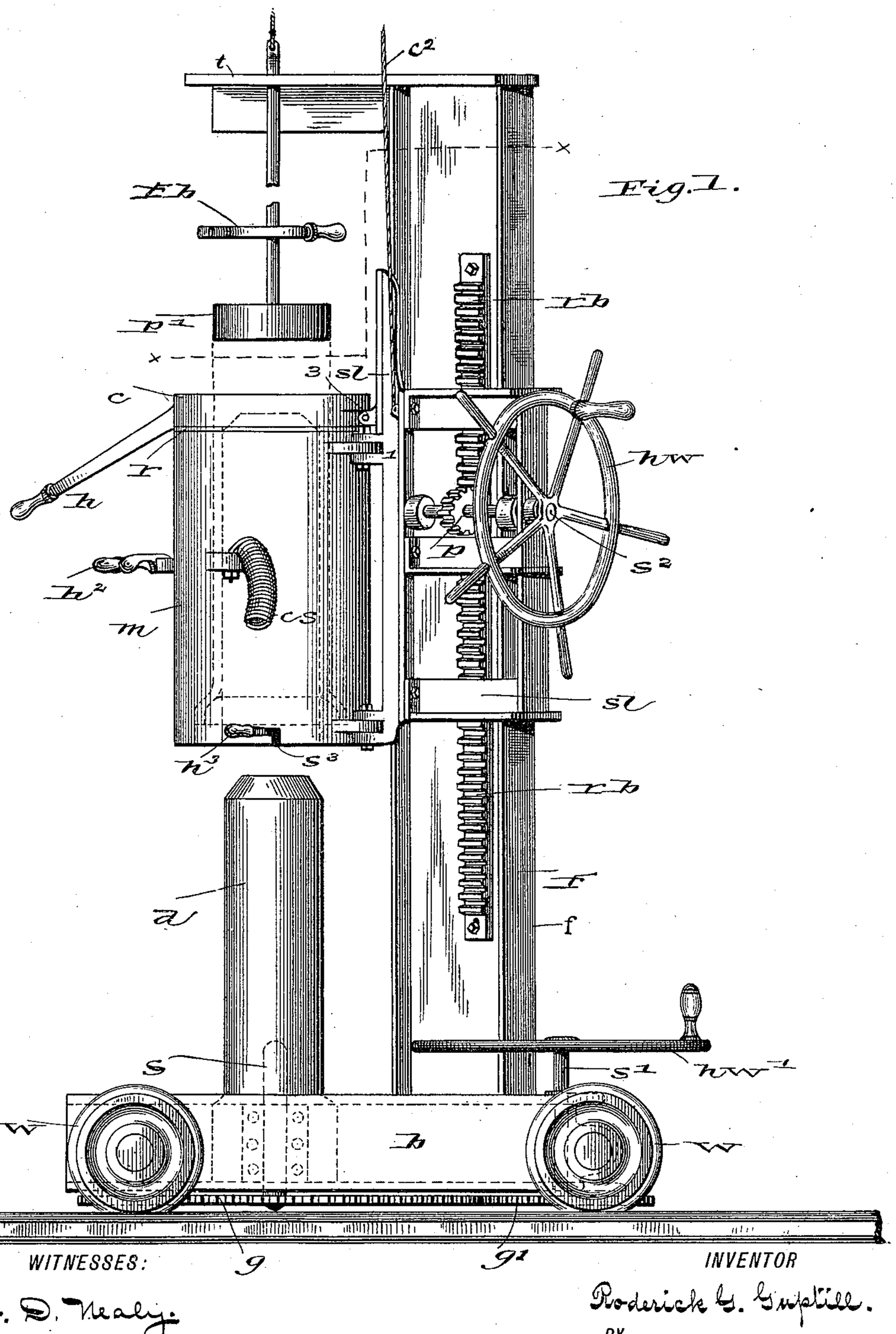

Fig. 1.

WITNESSES:

H. D. Healy.

E. B. Griffith.

INVENTOR

Roderick G. Guptill.

BY

C. P. Jacobs.

ATTORNEY.

(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

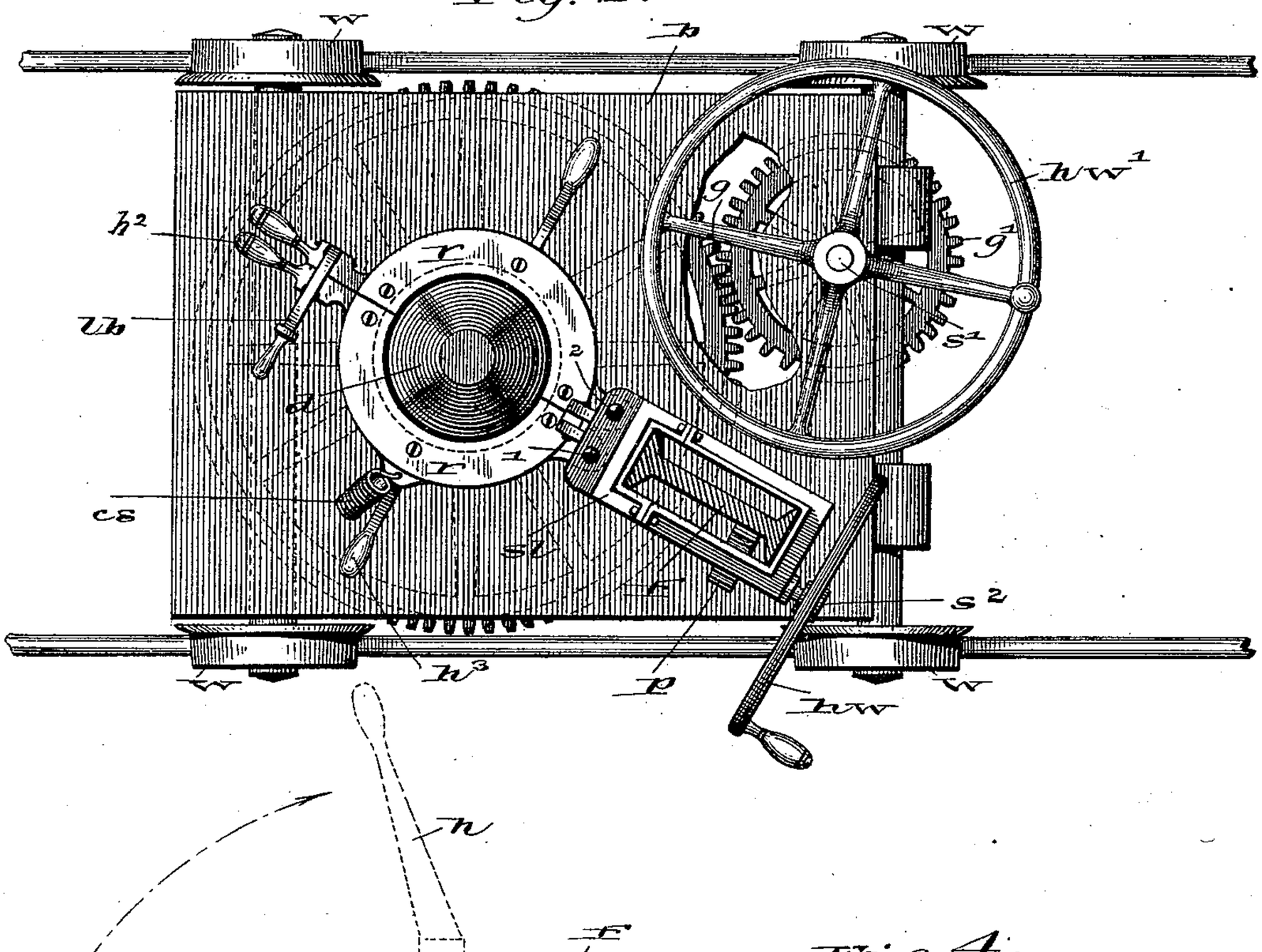


Fig. 3.

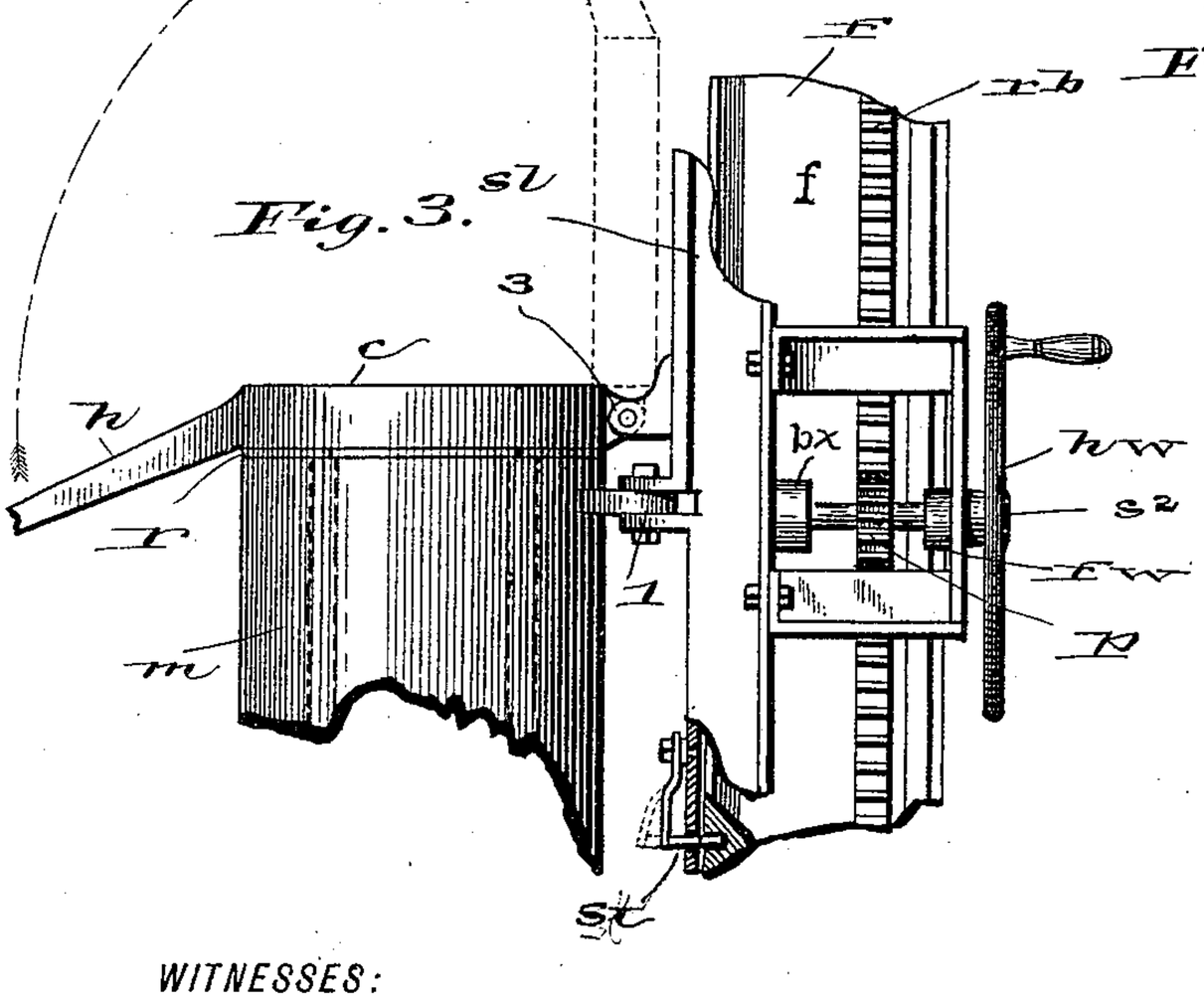
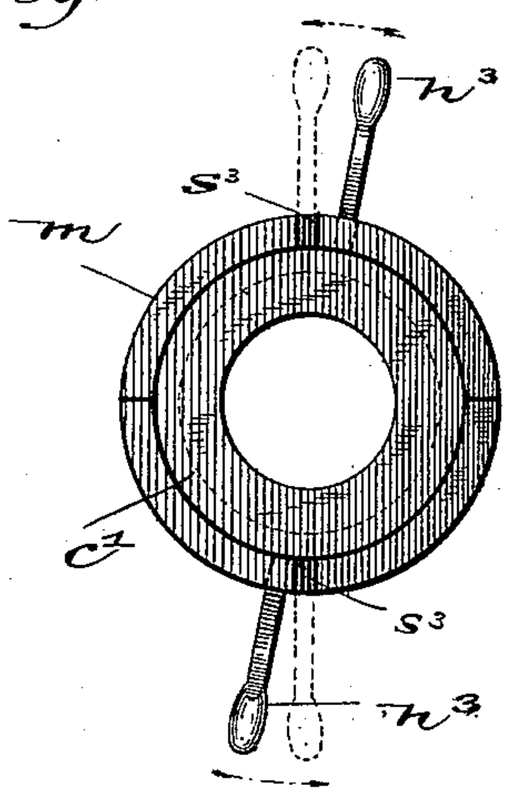


Fig. 4.



WITNESSES:

H. D. Healy.

E. B. Griffith.

INVENTOR

Roderick G. Guptill

BY

C. P. Jacobs.

ATTORNEY.

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Fig. 5.

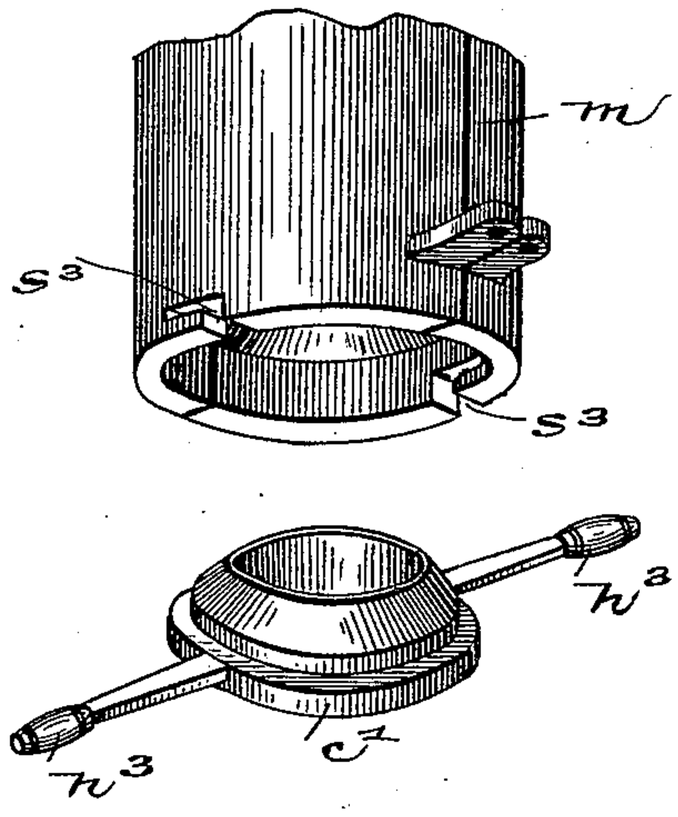


Fig. 6.

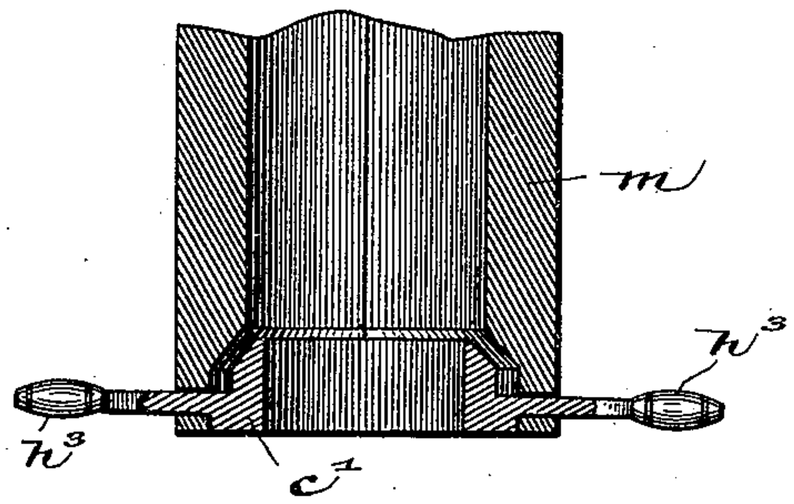


Fig. 7.

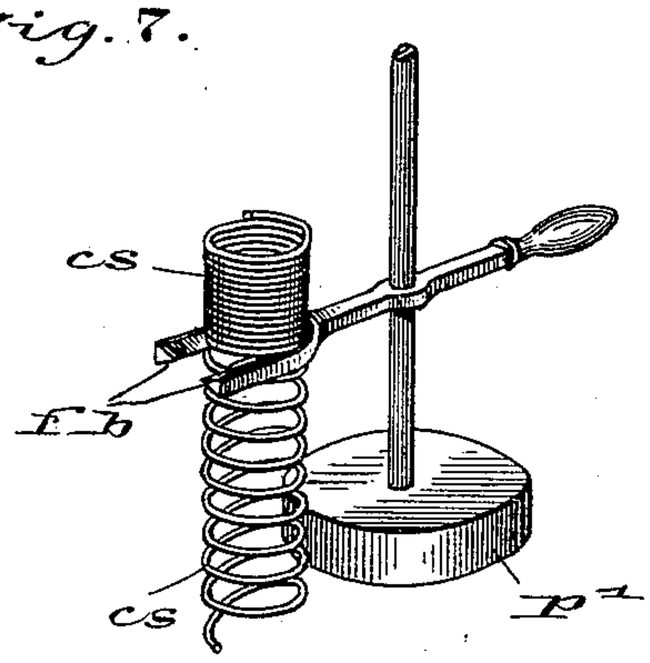
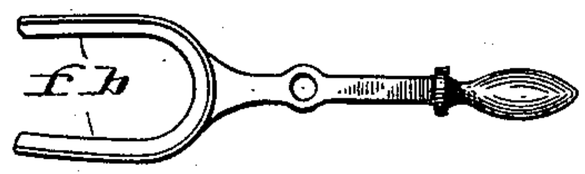


Fig. 8.



Witnesses

J. D. Healy.

E. B. Griffith.

Inventor

Roderick G. Guptill.

By his Attorney.

C. P. Jacobs.

UNITED STATES PATENT OFFICE.

RODERICK G. GUPTILL, OF PENDLETON, INDIANA.

GLASS-PIPE-CASTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 438,807, dated October 21, 1890.

Application filed June 18, 1890. Serial No. 355,820. (No model.)

To all whom it may concern:

Be it known that I, RODERICK G. GUPTILL, of Pendleton, county of Madison, and State of Indiana, have invented certain new and useful Improvements in Glass-Pipe-Casting Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

My invention relates to the construction of mechanism for molding glass pipes and tubes, and belongs to that class known as "hand-machines," and will be understood from the following description.

In the drawings, Figure 1 is a side elevation. Fig. 2 is a section on the line $x\ x$, Fig. 1, the cover of the mold being removed and a part of the floor being broken away, showing the engagement of the gears beneath. Fig. 3 is a detail view of a part of the mold with its slide, the latter partly broken away, showing the stop that locks it to the upright, the dotted lines indicating the position of the cover when thrown up. Fig. 4 is a bottom view of the mold, showing the inner collar in place, the dotted lines indicating the position of the handles when the tube is to be removed, the arrows indicating the direction of movement. Fig. 5 is a perspective view of the collar and the under part of the mold. Fig. 6 is a vertical section on the line of the handles in Fig. 4. Fig. 7 is an enlarged detail view of the plunger and forked bar, showing the connection to the spring. Fig. 8 is an enlarged top view of the forked bar.

In detail the machine comprises a frame-work *f*, to which in connected the rack-bar *rb*.

b is the base mounted upon truck-wheels *w* for convenience in moving about, and beneath this base are gear-wheels $g'\ g$, the latter one rigidly connected to the spindle *s*, which passes through the base and up into the socket of the die *d*, allowing the latter to revolve thereon. The gear-wheel g' is mounted on the lower end of a shaft s', upon the top of which is mounted a hand-wheel hw' for turning it. As this shaft revolves with its pinion, it necessarily revolves the larger gear *g*, with which it engages, rotating the die *d*. Above this die is the divided mold *m*, which is hinged at 1 and 2 to the slide *sl*, and having a cover *c* closing the top of the mold, this cover being hinged at 3 to the same slide. When the plunger p' is used, this cover must be thrown up, uncovering the mold, in the manner shown in the dotted lines in Fig. 3.

The mold is hollow and formed in two parts, each part having its independent hinge, as shown at 1 and 2 in Fig. 2. When the two halves of the mold are brought together by means of the handles h^2, they are locked by means of the bar *lb*, which is pivoted to one handle-bar, and has a projection on its under side which fits in a slot in the other handle-bar, securing them firmly. The hollow opening in the mold is adapted to receive the die below. On the top of the mold are half-rings $r\ r$, which have their inner diameter slightly less than that of the mold, so that the inner edge of the ring projects over the opening in the mold, which is indicated by the dotted lines in Fig. 2, thus partly closing up the space between the die and the inner face of the mold. The bottom of the mold is open (see Fig. 6) and the collar c', having a handle h^3 on each side, is fitted into the bottom of the mold, the handles entering the slots s^3 and being turned secure the collar in place, this collar forming the inside of the flange of the pipe-section of the mold and having an opening through it of the same diameter as the body of the die, as shown in Fig. 5.

A shaft s^2 is journaled in bearings in collar-boxings $b^\times$, rigidly connected to the frame-work of the slide. A pinion *p* is centrally mounted on this shaft, whose teeth engage with those of the rack-bar *rb*, and a hand-wheel *hw* is mounted on the outer end of this shaft, by revolving which the pinion engaging with the teeth of the rack-bar causes the slide to rise, carrying with it the mold. At the side of the mold is fastened a coiled spring *cs*, whose use will now be explained. p' is a plunger suspended from above by a rope, the plunger-rod passing through the top *t* of the frame-work, and secured thereto is a forked bar *fb*, having knife-edges (see Fig. 8) to engage with the coils of the spring *cs*. This plunger is of the same diameter as the mold

and is adapted to enter the latter and descend with it, the lower face of the plunger resting upon the molten metal, and the latter is therefore prevented from rising in the mold, the mass being held between the upper end of the die and the lower end of the plunger, thus equalizing the mass about the die and preventing it from rising upon one side or the other unequally, thus destroying the value of the casting. The plunger is held in close contact with the molten metal by means of the engagement of the spring *cs* with the forked bar *fb*. This spring passing up between the forks of the bar is thrown over, so that both edges of the fork will pass between the coils of the spring. (See Fig. 7.) This forked arm only descends as far as the top of the mold, and the tension of the spring holds the plunger down and the latter recedes out of the mold only as the metal is used in forming the pipe-section. When the latter is completed, the plunger and die come together. When the plunger is to be lifted, the spring is slipped from the arms of the forked bar and the plunger raised by means of a rope to which it is connected, at the other end of which is connected the usual counter-weight, balancing it in its movement in either direction. It must, however, be understood that when the plunger is to be used in connection with the mold the rings *r* are removed and the cover thrown up in the position shown in the dotted lines in Fig. 3. After completing the pipe section, if there be any surplus metal at the top of the mold, the cover *c* is thrown down, chilling this metal so that it may readily be broken off and removed. It will thus be seen that by using the plunger a pipe-section of shorter length than the mold may readily be formed by pouring in only so much metal as is necessary to form a pipe-section of the length required and then allowing the plunger to descend so as to form the pipe-section complete out of the amount of metal in the mold. When, however, a pipe-section of just the length of the mold is desired, and the metal is soft enough, it may be compressed about the die by simply throwing down the cover, and the plunger need not be employed. In such case the rings *r* are put on, and their inner diameter being less than that of the mold, their inner edge projecting over the inside forms a cutting-lip to shape that part of the molten mass which is in contact and allow the die to force any superfluous metal out and above the mold under the cover and thus properly shape the top of the pipe-section. For this purpose the cover *c* has a recess beneath to allow the entrance of the top of the die, as shown in dotted lines in Fig. 1, and a similar recess is formed beneath the plunger.

To the slide *sl* is connected another rope or cord c^2, which has a weight at its other end of sufficient size to counterbalance that of the mold with its casting. As the movement of the truck is intended to be limited, and only a short distance from the furnace, the rope c^2 connected to the slide may be passed over a sheave-wheel fastened to the ceiling above, using a similar mold as a counter-weight.

When it is desired to stop the mold at any point to limit the length of the pipe-section to be formed, the slide may be locked to the upright by means of the spring-stop *st*, (shown in Fig. 3,) which is fastened to the slide and has a pin which passes through the slide into the upright and registers with corresponding holes therein, and these may readily be gaged at set distances apart, so that the operator can tell at once at what point to adjust the stop, so that it will automatically lock the slide to form a pipe-section of the required length. In such case if any surplus metal be left at the top it may be cracked off and removed in the ordinary way.

What I claim as my invention and desire to secure by Letters Patent, is the following:

1. In a glass-molding machine, a truck, a fixed die supported and revoluble thereon, a frame-work carried upon such truck, a slide-frame movable vertically thereon, a sectional mold hinged to such slide, a rack-and-pinion mechanism connected to the frame-work for elevating the slide, a counter-balance connected thereto for sustaining its weight, and mechanism for revolving the fixed die, all combined substantially as shown and described.

2. In a glass-molding machine, a truck supporting a frame-work, a revoluble die secured thereon, mechanism for revolving the die, a sectional mold hinged to a slide connected to the frame-work and movable vertically thereon, a weight and cord for counterbalancing that of the mold mechanism for raising and lowering the mold, also connected to such frame-work, a cap covering the mold, also hinged to such slide, means for locking the parts of the mold together, a plunger sustained above such mold by a cord and weight, adapted to be lowered into the mold for confining the metal between it and the top of the die, and a spring connected to the side of the mold, adapted to engage with a locking device upon the plunger-rod for securing the plunger in position, all combined substantially as shown and described.

3. In a glass-molding machine, a sectional mold hinged to a slide movable vertically upon the frame-work, means for raising and lowering the same, a die located in line below the opening in the mold and supported by and revolving upon a base resting upon trucks, with means for revolving the die when the metal has been poured into the mold, in combination with a plunger supported and balanced above such mold and adapted to enter the same, a spring locking device connected to the mold engaging with a bar on the plunger set at any suitable point for confining the metal between such plunger and the top of the fixed die, all combined substantially as shown and described.

4. In a glass-molding machine, a sectional

mold hinged to a slide movable vertically upon a supporting frame-work and counterbalanced by a suitable weight, a die fixed with reference to such mold and in line therewith, but supported and revoluble upon the base of the frame-work, in combination with a collar fitting into the bottom of such mold and removable therefrom for forming the bell of the pipe-section, substantially as shown and described.

5. In a glass-molding machine, a sectional mold hinged to a slide, the latter movable vertically upon an upright connected with the frame-work and counterbalanced by a suitable weight, means for raising and lowering the slide with its connected mold, the latter provided with a cover also hinged to the slide, means for locking the parts of the mold together, the upper ends of the mold flanged to form a cutting-lip for shaping the top of the pipe-section, all combined substantially as shown and described.

6. In a glass-molding machine, a mold composed of two halves movable vertically upon a frame-work and in line with a fixed die secured to the base thereof and revoluble thereon, such mold provided with flanges or rims at the top of each half-section, whose diameter is less than that of the mold itself, whereby a cutting edge or lip is formed for shaping the top of the pipe-section, substantially as shown and described.

7. In a glass-molding machine, a frame-work, a sectional mold movable vertically thereon and suitably counterbalanced, a die secured to and revoluble upon the base of the frame-work and located in line with the mold, whereby the latter may be lowered over and drawn away from the die for molding glass-tube sections, in combination with a plunger suspended above the mold and in line with the opening therein and adapted to descend into such mold for the purpose of confining the metal between such plunger and the top of the die at any suitable point for forming pipe-sections of various lengths, substantially as shown and described.

In witness whereof I have hereunto set my hand this 29th day of May, 1890.

RODERICK G. GUPTILL.

Witnesses:
H. D. NEALY,
C. P. JACOBS.