

J. G. OLIVER.

MACHINE FOR MOLDING CLAY TOBACCO-PIPES.

No. 190,977.

Patented May 22, 1877.

Fig. 1.

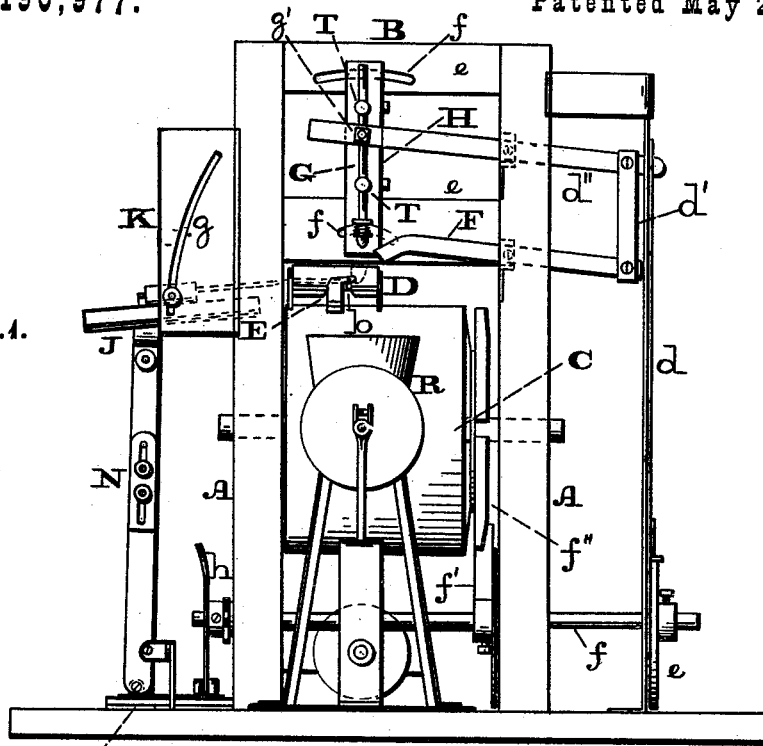


Fig. 7.

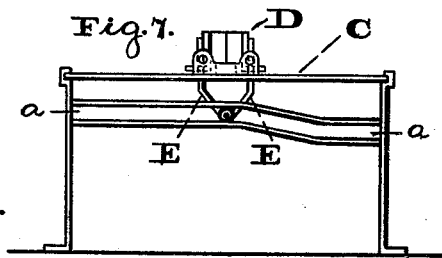
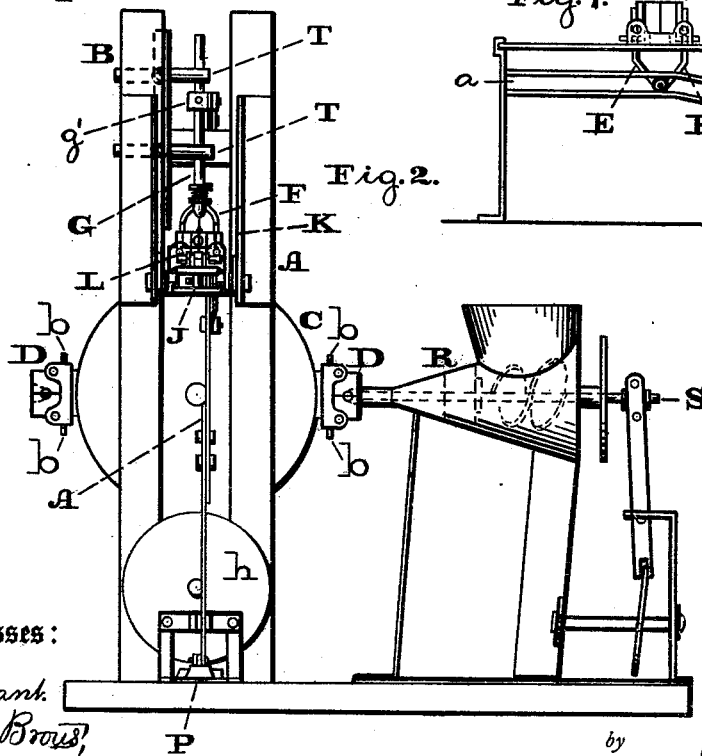


Fig. 2.



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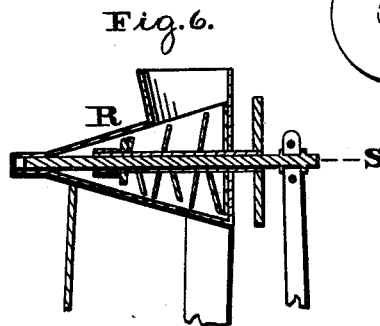
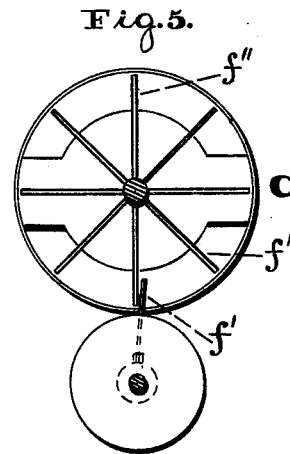
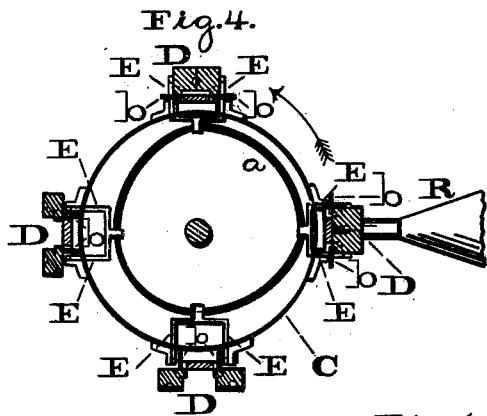
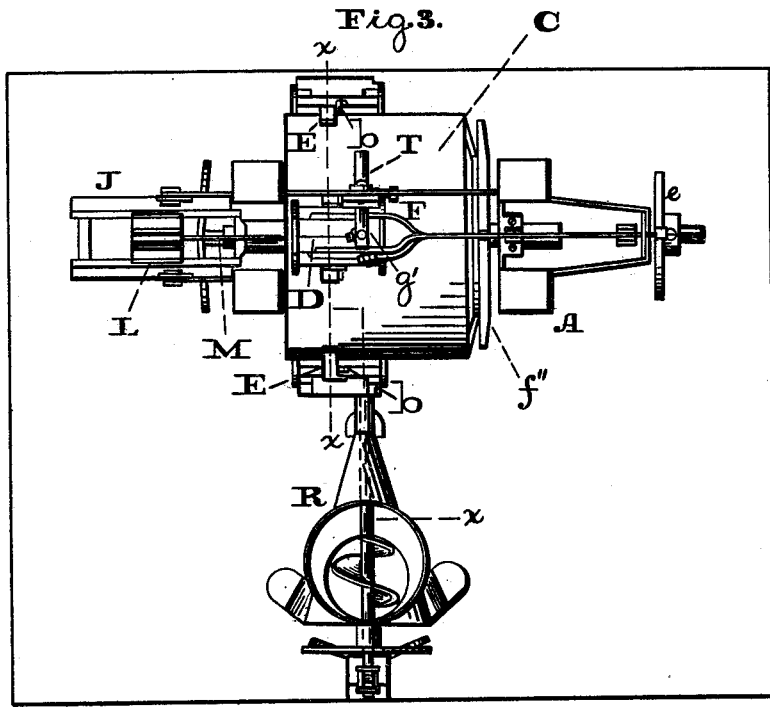
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR MOLDING CLAY TOBACCO-PIPES.

Specification forming part of Letters Patent No. **190,977**, dated May 22, 1877; application filed November 3, 1876.

To all whom it may concern :

Be it known that I, JOSEPH G. OLIVER, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Molding Clay Tobacco-Pipes; and I do hereby declare the following to be a clear and exact description of the nature thereof, sufficient to enable others skilled in the art to which my invention appertains to fully understand, make, and use the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figures 1 and 2 are side elevations of the apparatus embodying my invention. Fig. 3 is a top or plan view thereof. Fig. 4 is a transverse section in line *x x*, Fig. 3. Fig. 5 is an end view of the mold-carrier. Fig. 6 is a central longitudinal section of a portion in line *x x*, Fig. 3. Fig. 7 is a side view of a modification.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a rotary cylinder or table carrying one or more automatically opening and closing molds, which are hinged to the cylinder or table, and operated by embracing and engaging arms. It also consists of novel means for filling or feeding the molds. It also consists of a clamp for holding the molds during the operation of molding the bowl and stem of the pipe. It further consists of means for adjusting the plunger that forms the cavity of the bowl, so that it may be set for pipes of different angles and sizes, and form bowls of uniform thickness. It also consists of means for adjusting the borer that forms the bore of the stem, so that it may be set for pipes of different angles and sizes.

Referring to the drawings, A B represent a frame, on which is mounted a revolving cylinder or table, C, to which is pivoted one or more sectional molds, D, the contour of the working faces of each of which is that of a tobacco-pipe.

Aside of the mold D there are arms E, which pass through the cylinder or table C and receive advancing and receding motion by means of a cam, *a*, which, located adjacent to the cylinder or table, is fixed in position. The upper or outer ends of the arms are hooked

shaped, and they are adapted to engage with pins *b* projecting laterally from each section of the mold.

F represents a forked arm, which is pivoted to the frame A B, and overhangs the mold that is uppermost or presented to it.

Rising and lowering motions are imparted to the arm F by means of arms *d d'*, the arm *d* being operated by a cam, *e*, on the main shaft *f*. To the arm *d* there is also pivoted an arm, *d''*, to which is pivoted a vertically-extending plunger, G, whose lower end is of the contour of the inner face of the bowl of a tobacco-pipe, and it is so located that as it descends it will enter the portion of the mold corresponding to the bowl of the pipe. This plunger G has its bearings on a bar or plate, H, which is fitted to horizontal pieces *e* of the frame A B, said pieces *e* having curved slots *f*, in which are fitted set-screws, by means of which the plunger may be set at various angles and moved in the direction of the length of the apparatus, so as to adapt said plunger for molding pipes of various sizes.

J represents a bed, which is jointed to ears K secured to the frame A B, and located adjacent to the upper face of the cylinder or table C at the end of the mold, where the bore of the pipe is to be formed. In the ears K there are curved slots *g*, in which are fitted the axial bolts or screws of the bed J. On the bed there is mounted and guided a carriage, L, which carries a wire, M, which is adapted to penetrate the clay in the mold D and form the bore of the stem of the pipe. To the carriage L there is pivoted an arm or bar, N, which is formed of a series of jointed sections, and it receives reciprocating motion from a slide, P, with which engages a cam, *h*, secured to the main shaft *f*.

It will be seen that by means of the axial carriage J, slots *g*, and jointed arm N, the boring wire may be adjusted or made to assume various angles, and raised and lowered so as to form bores in the pipe-stems of various angles and various sizes.

R represents a hopper, which is located with its discharge-spout adjacent to the bowl portion of the mold D. In the hopper is a rotary spiral conveyer, and its hub is hollow for the passage of a reciprocating plunger, S,

power being communicated to the plunger and conveyer by means of cams, pulleys, or other proper means.

The cylinder or table C will have an intermittent motion, and power will be communicated thereto in any desired manner. In the present case said power is derived from the main shaft through the medium of a tappet, *f'*, secured thereto and engaging with radial arms *f''* on the cylinder or table, as more readily seen in Figs. 1 and 5.

The operation is as follows: Power will be communicated to the various shafts, and the hopper R properly supplied with clay. The mold adjacent to the discharge-spout will be closed, this being occasioned by the arms E, which, forced out by the cam *a*, embrace the sides of the mold. The spiral conveyer having pressed a quantity of clay to the discharge-spout of the hopper, the plunger S receives motion toward the discharge-spout, and thus injects a quantity of clay into the bowl portion of the face of the mold, said clay diffusing itself through both bowl and stem portions of the face of the mold, and thus receives the outside shape of a pipe. The cylinder or table C, revolving, carries the filled mold to the plunger G, and a fresh mold is presented to the discharge-spout of the hopper. In the meantime the arm F descends and locks the sections of the filled mold, the cylinder or table having ceased its rotation. The plunger G now enters the bowl portion of the filled mold, thus forming the cavity of the bowl, and the carriage L advances the wire M into the stem portion of the filled mold, thus forming the bore of the stem. The plunger, boring-wire, and locking-arm having returned to their normal positions, the cylinder or table continues its rotation, and, owing to the cam *a*, the arms E are drawn inward or downward, thus depriving the filled mold of the support of said arms, and at the same time engaging with the pins *b*, whereby the sections of the molds are separated and the mold is opened, so that the molded pipe may be removed. In the meantime another filled mold has advanced to the plunger G, and a fresh mold is presented to the discharge-spout of the hopper. After a mold has been emptied, the arms E are again operated by the cam *a*, so as to close the sections of the mold when said mold reaches the discharge-spout of the hopper, and it is filled, carried to the plunger and boring-wire, opened and discharged, the operations being repeated and continued, as desired.

It will be seen that the plunger may be set at any angle by properly adjusting the bar H in the slots *f*, and also moved longitudinally or horizontally for pipes of different lengths.

In order to adapt the plunger for bowls of varying depths, the connection between the rod of the plunger and the arm *d''* is by means of a boss, *g'*, through which the rod is passed,

and to which is connected a pin for attachment of the arm *d''*. The plunger may be raised and lowered on the boss *g'*, and, by means of a set-screw, provision is had for holding said plunger in the adjusted vertical position.

The carriage L may also be raised and lowered on the cheeks or ears K, so as to provide horizontal adjustments for the boring-wire, and, owing to the axial connection of the bed J to the cheeks or ears K, the boring wire may be adjusted relatively to the angular set of the stem of the pipe. These adjusting movements will be assisted by the jointed sections of the bar N, as said sections permit the rising and lowering of the carriage L, and also conformation of the bar to the angle imparted to the carriage.

In order to prevent the plunger forming bowls of irregular thicknesses, provision is also made for the transverse adjustment of the plunger. For this purpose the bearings or guides T of the rod of the plunger are movable in the bar H, whereby the head of the plunger may be set true over the mold, and there will be an equal thickness of clay between the face of the plunger and face of the molds, thus making an equally-balanced pipe. Set-screws are passed through the bar H, and, bearing against the bearings or guides T, serve to hold the plunger in its transversely-adjusted position.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a rotary cylinder or table, of one or more automatically opening and closing molds, which are hinged thereto and operated by sliding arms, which embrace and engage with the sides of the molds, substantially as and for the purpose set forth.
2. The hopper provided with a spiral conveyer and plunger, substantially as and for the purpose set forth.
3. An injecting-filling plunger, in combination with molds, substantially as and for the purpose set forth.
4. The combination, with the sectional molds D, of the clamp F, substantially as and for the purpose set forth.
5. The plunger made transversely adjustable by means of the movable bearings or guides T, substantially as and for the purpose set forth.
6. The plunger G, made adjustable angularly, horizontally, and vertically, substantially as and for the purpose set forth.
7. The boring-wire M, made adjustable angularly, horizontally, and vertically, substantially as and for the purpose set forth.

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