DAVID COPELAND, Jr.

Improvement in Machines for Molding Drain and Sewer Pipes.

No. 115,030. Patented May 23, 1871.

Fig 1.

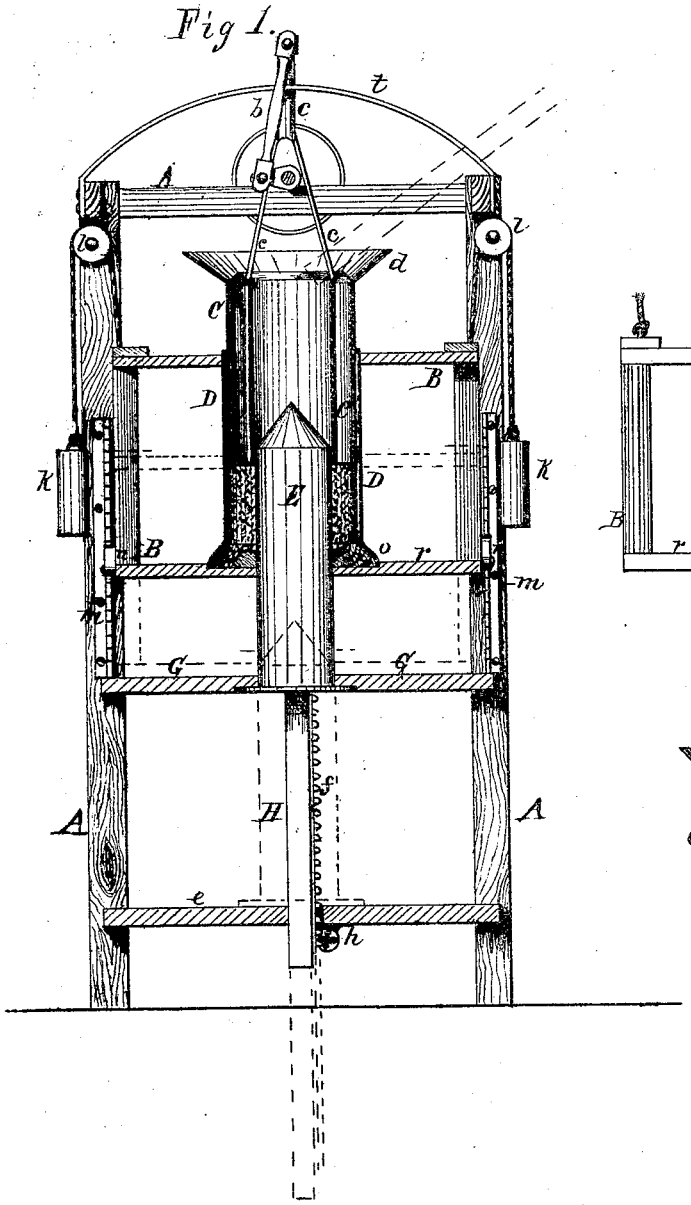


Fig 2.

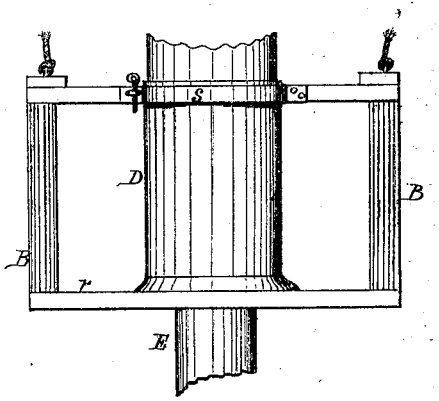


Fig. 3.

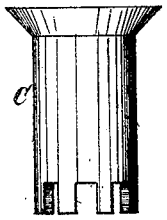
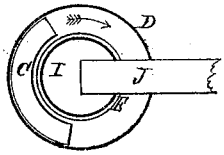


Fig 4.



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DAVID COPELAND, JR., OF ROCHESTER, NEW YORK.

IMPROVEMENT IN MACHINES FOR MOLDING DRAIN AND SEWER PIPES.

Specification forming part of Letters Patent No. 115,030, dated May 23, 1871.

I, DAVID COPELAND, Jr., of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Machines for Molding Drain or Sewer Pipe, of which the following is a specification:

My invention relates to a device for automatically feeding and tamping the cement of which drain and sewer pipe is composed into molds, and also to certain means of removing the mold-case as each length of pipe is finished.

In the drawing, Figure 1 is a vertical central section of my invention. Fig. 2 is a side elevation of the mold-frame removed from the machine. Figs. 3 and 4 show different forms of the rammer.

In general terms, my invention consists of an annular or other similarly-shaped rammer reciprocating within a mold-case and around the central core, the material being introduced through the center of the rammer, and the mold arranged to retreat as it becomes filled.

A is a frame-work which supports the different parts of my invention. B is a smaller frame, which sustains the mold D during the process of filling, and moves vertically upon suitable guides within the frame A. C is an annular rammer having a vertical movement imparted to it by means of a crank, *a*, and link *b*, connected to a projecting arm, *c*, or by other suitable device or devices for reciprocating it. This rammer fits easily within the mold-case D and around the core E, and is provided with a funnel-shaped rim, *d*, at its upper extremity to receive the material prepared for the pipe through a trough, shown in dotted lines in Fig. 1, or by other convenient means, and its spindle or stem *c* passes through a suitable guide, *t*, at the upper part of the machine. The core E is stationary while the mold is being filled, and is held in position by the cross-girt G, firmly secured to the main frame A, and by the steady-bar H, to which an elevating and retaining rack, *f*, is fastened. The core passes loosely through the lower platform *r* of the frame B, upon which the mold D rests, and terminates in a conical or hemispherical cap, as shown, and the steady-bar H is guided below by a girt, *e*, extending across the frame A. Thus the core, the mold, and the rammer are retained in the same vertical line, and concentric with each other. A pinion, *h*, secured to a suitable shaft, having bearings upon the lower portion of the main frame A, meshes into the rack *f* and forms a means of adjusting the core E and retaining it in the required position. The mold-frame B is suspended by means of weights K, the cords of which are secured to two or more corners of the frame, and pass over pulleys *l* upon the main frame A, and the gravity of these weights taken together considerably more than counterbalances the frame B and mold D. It will be observed that by this means the frame B is always drawn up to the upper limit of its movement when free, and also that the degree of compactness with which the material is tamped in the mold is controlled, as hereinafter more fully explained. Ratchet-racks *m* are provided upon those portions of the main frame adjacent to the vertical movement of B, with which pawls *n*, pivoted to the latter, engage, and thus retain said frame at any vertical position below the upper limit of its movement against the action of the counter-weights *k*. For the purpose of forming the joint recess at the end of the length of pipe, the mold D, Fig. 2, is secured to the supporting-frame B by means of a binder or strap, *s*, hinged to the frame, drawn around the mold and locked at the other side of the latter in any convenient manner. Thus the molds may be readily removed by unlocking the strap and lifting them from the socket in the platform *r*, and replaced with others.

The operation and mode of using my invention are as follows: In beginning the formation of a length of pipe, the frame B is drawn down to the position shown in dotted lines, Fig. 1, and the core E lowered by means of the pinion *h* and shaft, as also indicated by dotted lines in the same figure. Sufficient space is thus left between the lower extremity of the rammer C and the upper end of the core to admit the mold-case to its place in the frame B, in which it is locked by the strap, as before described. The pawls *n* are then released, and the frame allowed to rise upon its guides to the upper limit of its movement, the rammer C extending nearly to the platform *r*, and the core E also elevated to the position shown in full lines, Fig. 1.

It will be observed that no matter what the vertical position of the mold-case may be, the rammer and core E are so located with reference to each other that when the rammer is at

the lower extremity of its stroke it passes somewhat below the end of the core, and when at the upper extremity it is sufficiently above said end to admit the material for the pipe from the open center of the rammer into the annular space, the distribution of such material being effected by the conical extremity of the core. The rammer, therefore, by its vertical movement, forces the cement into the annular space between the core and the mold-case, and the compactness with which the material is tamped is regulated by the gravity of the counter-weights *k*, which, if increased, obviously offers more resistance to the downward thrust of the rammer. The ratchets *m* and pawls *n* retain the frame B after each stroke of the rammer, the operation being continued until the mold is filled. The core E is then lowered, the mold removed, and the collar *p* taken from the extremity of the pipe so formed. Another mold may then be put in place, and the above-described operation repeated.

In Figs. 3 and 4 I have shown other forms of rammers which it may be desirable to use in connection with my apparatus. D, Fig. 3, represents one notched upon its lower or working edge, whereby it accommodates itself more readily to the varying mixed sizes of gravel used in the composition. This necessitates a slight circumferential movement of the rammer either backward and forward or continuous at each reciprocation, to equalize its action upon the cement around the mold. In Fig. 4 the rammer is shown as only the section of an annulus, and it will doubtless be found preferable to give it a continuous feed around the core, as indicated by the arrow, to equalize the action. In this case a pipe, I, is introduced directly over the core, which receives the material from the trough J and distributes it around the mold similarly to the entire annulus C, Fig. 1.

I do not mean to be confined to the mechanical means shown for operating the rammer for supporting, adjusting, and securing the mold-case D or core E, as other methods of effecting such purposes may be introduced and not change the general operation of the parts named.

It may in many cases, also, be advantageous to form the joint recess in the pipe at the upper end of the case D, the collar *p* being forced into the material by a stroke from the rammer after the mold is filled.

It is known that filling drain-pipe molds by hand-tamping has not been practically superseded by machinery; but it will be seen that the operation of the apparatus herein described imitates the process of hand-filling in effect, and is automatic in its action and simple in construction.

What I claim as my invention is—

1. In combination with a mold-case, D, and a suitable central core, E, an annular rammer, C, arranged to be operated by power, for the purposes set forth.

2. In combination with an automatically-retreating mold-case, D, a vertically-removable core, E, and a reciprocating rammer actuated by power, arranged to be operated substantially in the manner herein set forth.

3. In combination with a reciprocating rammer, C, the mold-case D, when arranged to retreat at and by the reciprocation of said rammer, for the purposes set forth.

4. In combination with the mold-case D and a reciprocating rammer, the vertically-adjustable supporting-frame B and counter-weights *k*, operating substantially as described.

5. The combination of a core provided with a conical extremity within the mold-case, and a regularly-reciprocating annular rammer, whereby the material is distributed and received under the latter, substantially in the manner set forth.

6. In combination with the vertically-adjustable mold-frame B, case D, and counter-weights *k*, the ratchets *m* and pawls *n*, for the purposes set forth.

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