

(No Model.)

W. HAMLET.

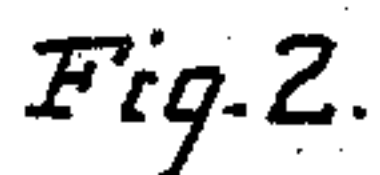
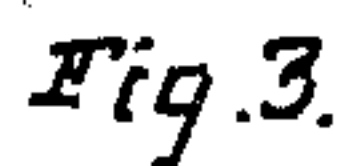
Machine for Forming and Laying Continuous Drain
Pipes.

No. 231,908.

Patented Sept. 7, 1880.

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UNITED STATES PATENT OFFICE.

WILLIAM HAMLET, OF MERCED, CALIFORNIA.

MACHINE FOR FORMING AND LAYING CONTINUOUS DRAIN-PIPES.

SPECIFICATION forming part of Letters Patent No. 231,908, dated September 7, 1880.

Application filed May 27, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HAMLET, of the city and county of Merced, in the State of California, have invented an Improved Machine for Forming and Laying Continuous Drain-Pipe; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to certain improvements in that class of machines for forming and laying cement pipe in which the machine is made to move over the ground on which the pipe is to be laid, so as to make a continuous pipe without breaks or joints.

Usually a trench or ditch is first made, and the machine operated in it so as to make and lay the pipe in the ditch. In this class of machines the pipe is formed by means of a piston working in a cylinder in which the cement is supplied. A core in the cylinder forms the hole in the center of the pipe, and the pressure of the piston, as fresh cement is added, forces the machine forward, leaving the complete solid pipe lying in the track of the machine.

Heretofore a simple lever has been used for giving to the piston the required reciprocating motion in the cylinder, and no means were provided for giving a positive feed of cement into the cylinder.

The first of these devices I have improved, and the latter I have provided, and in addition to these I have made several important and valuable improvements, which are calculated to facilitate the operation and improve the character of the pipe, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is a vertical longitudinal section. Fig. 3 is a transverse section across the end of the machine through the line *x x*, Fig. 2.

Let *A* represent the tube or cylinder in which the pipe is formed.

B is the feed-tube, through which the cement is conducted into the tube in front of the reciprocating piston *C*.

The core *d*, which forms the central hole in the cement pipe, is permanently secured in the center of the cylinder *A*, in front of the opening through which the cement enters the cyl-

inder, by means of thin plates *e e*, which stand lengthwise of the tube, so that as the cement is forced through the tube by the piston it will surround the core, and after it passes the thin connecting-plates *e e* the pressure will cause it to unite and form a solid pipe with a central hole.

It will be noticed that when the piston is drawn back a clear and unobstructed space is left between it and the core for the cement to drop into from the feed-tube above, so that the next stroke of the piston will force the cement directly through the tube and against the core. The end of the core is made conical, so as to facilitate the passage of the cement.

Having described the first feature of my improvement, I will now describe the other feature, which relates to the device for reciprocating the piston and applying the power for condensing the cement and forming the pipe.

For this purpose I employ jointed or toggle levers *f g*, which are operated by two cranks, *h*, and a crank-shaft, *I*. The forward end of the toggle-lever *f* is pivoted to the center of the piston, while its rear end is pivoted to the lever *g*, which is pivoted to the head of the tube *A*. A pitman or connecting-rod, *j*, connects the crank with the toggle-levers at the joint or middle, so that at each revolution of the crank-shaft the piston is drawn back and forward.

By this means I operate the piston by a rotary or crank motion, which is much easier operated than a reciprocating lever, and I employ two cranks for the application of the power. By interposing the toggle-lever between the crank and piston I provide a gradually-increasing leverage as the piston moves forward, so that the latter end of the stroke is capable of exerting an immense power for condensing the cement and forcing the machine forward. This is a great improvement in this class of machines.

For convenience in operating this crank-shaft I provide a seat, *K*, for the operator, and foot-rests *l l*, on the machine, in a convenient position, so that the operator can ride and turn the cranks, thus adding his weight to the pressure of the machine. In order to steady the machine when it is thus operated, I hinge to each side of the cylinder *A* a thin runner, *m*, which can be turned down to steady the ma-

chine when the operator is riding, or turned up over the cylinder when the operator desires to walk and operate the machine.

In making small-sized pipe the operator will have to walk, as the pipe will not be strong enough to sustain the extra pressure, but in making large and heavy pipe his weight will be an advantage. This, however, will be regulated by the character of the pipe to be laid and the nature and character of the ground over which the machine is to pass.

O is a curved bar which is hinged to the frontend of the machine, which can be dropped upon the ground in front and serve as a brake to prevent the machine from moving too fast and breaking the pipe, and to increase the pressure upon the piston. This brake is used when the operator is walking and working the machine, and when not required is turned up over the front of the machine. By pressing his foot upon this brake when it is turned down on the ground the friction can be increased at will, so as to increase the pressure upon the piston.

Another difficulty heretofore encountered in this class of machines is that the cement would not feed quick enough through the feed-pipe B when the piston was withdrawn. To remedy this I make a slot in the tube near its lower end, through which a cutter-plate, *p*, passes. This plate I secure in the slot by a pin, and I connect it by a lever, *q*, with the pitman *j*, so that as the pitman is moved up and down by the crank the cutter-plate will be simultaneously operated up and down in the feed-tube by the same movement. This cuts the cement in the tube, the downward motion of the cutter occurring as the piston recedes, so that it not only keeps the cement loose but also forces it down into the cylinder. By means

of the above improvements I render the machine much more effective and more convenient to operate.

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

1. The combination, with the cylinder A, having a feed-tube, B, and a fixed cone or core, *d*, disposed centrally in the cylinder, of the piston C and cutter *p*, connected to the piston-operating mechanism, substantially as and for the purpose set forth.

2. The combination, with the cylinder A, of the piston C, the crank-shaft I, with its cranks, connecting-rod *j*, and toggle-levers *f g*, substantially as specified.

3. The combination of the crank-shaft I, with its cranks *h*, the piston C, the toggle-levers *f g*, the connecting-rod *j*, the cutter *p*, and the lever *q*, substantially as specified.

4. In a machine for making and laying in place a continuous cement pipe, the combination, with the cylinder A, of the hinged side boards or runners, *m*, for the purpose set forth.

5. The tube or cylinder A, provided with siderunners, *m*, and having the seat K and foot-rests *l l*, in combination with the cranks *h h* and intermediate connections for operating the piston to condense the cement and force the machine forward, substantially as specified.

6. In a machine for making and laying in place a continuous cement pipe, the hinged brake or shoe O, for the purpose described.

In witness whereof I have hereunto set my hand and seal.

WILLIAM HAMLET. [L. S.]

In presence of—

WM. F. CLARK,

WM. F. SMITH.