

(No Model.)

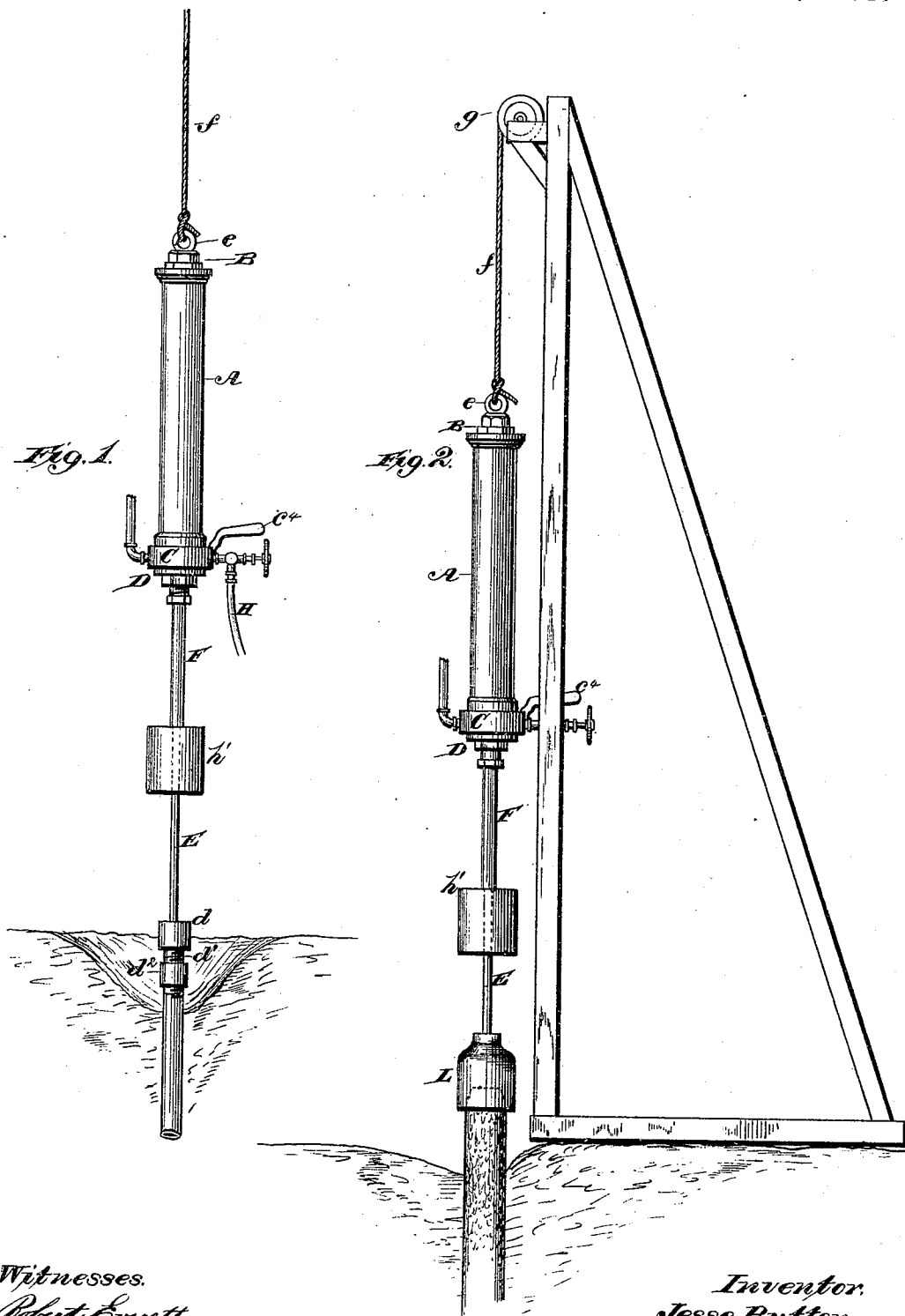
2 Sheets—Sheet 1.

J. BUTTON.

STEAM PIPE AND PILE DRIVER.

No. 248,702.

Patented Oct. 25, 1881.



Witnesses.

Robert Emmett.

J. A. Rutherford

Inventor.
Jesse Button.

By James L. Norris.
Atty.

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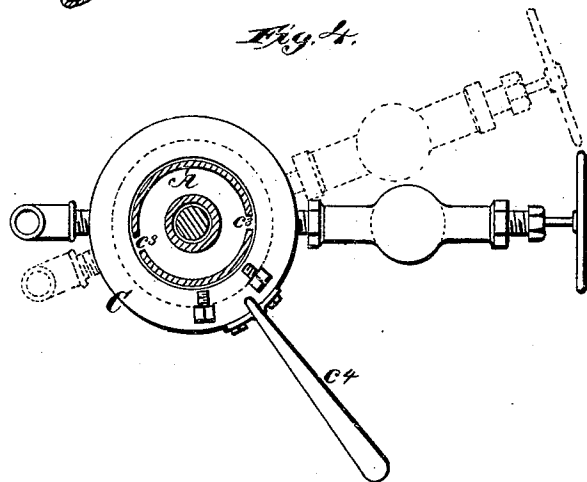
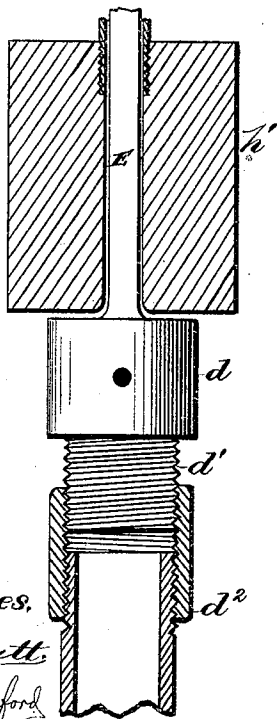
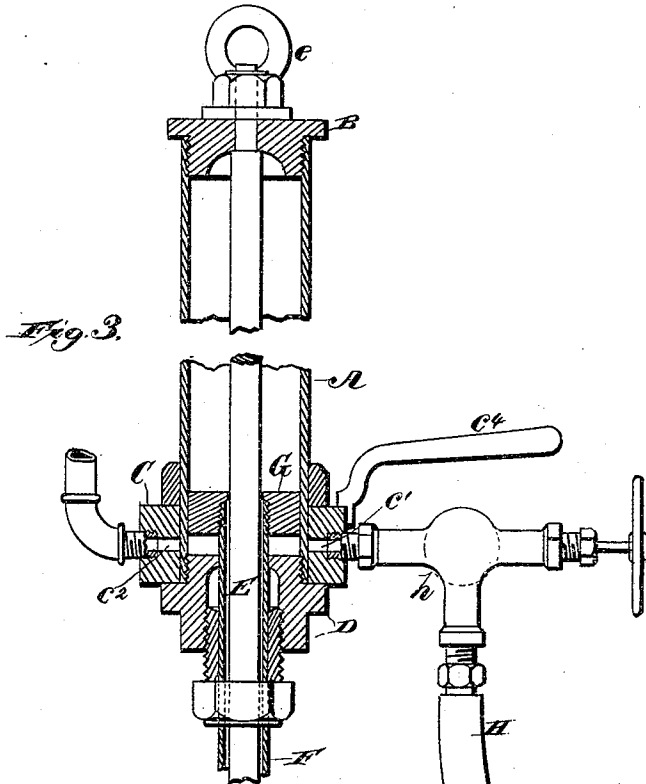
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UNITED STATES PATENT OFFICE.

JESSE BUTTON, OF NEW YORK, N. Y.

STEAM PIPE AND PILE DRIVER.

SPECIFICATION forming part of Letters Patent No. 248,702, dated October 25, 1881.

Application filed May 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, JESSE BUTTON, of the city, county, and State of New York, and a citizen of the United States, have invented a new and useful Improvement in Steam Pipe and Pile Drivers, of which the following is a specification.

My invention relates to apparatus employed either for driving pipes or piles in the ground, and it is chiefly designed to facilitate the driving of pipes for Artesian wells, although, as will be seen hereinafter, the apparatus can, with but slight changes, be employed for pile-driving.

In the drawings, Figure I is a side elevation of my apparatus adapted for driving pipe. Fig. II is a side elevation of the apparatus adapted for driving piles. Fig. III is a vertical section, on an enlarged scale, of the apparatus adapted for driving pipe; and Fig. IV is a horizontal section taken on a plane above the induction and eduction pipes.

A indicates a cylinder, provided at its upper end with a suitably-constructed adjustable head, B, and at its lower end with a surrounding ring-valve, C, and stuffing-box D, which latter is fitted to the end of the cylinder below the ring-valve. This ring-valve is provided with the inlet c^1 and with the exhaust c^2 , the cylinder being provided with openings c^3 , corresponding with the passages of the valve. Said valve is arranged to turn upon the cylinder, in order to bring one of its passages into register with one of the passages through the cylinder, and, to facilitate the operation of the ring-valve, it is provided with a handle, c^4 .

H indicates a steam-hose, by means of which steam is fed through the valve to the cylinder, said hose connecting with a suitable inlet-pipe, h , that is provided with a valve for cutting off the supply of steam.

E indicates a rod, which is provided at its lower end with a strong shoulder, d , said shoulder or enlarged end of the piston-rod having a screw-threaded portion, d' , to admit of the same being coupled with the pipe to be driven, by means of a coupling, d^2 , as illustrated in Figs. I and III, the said shoulder constituting a cushion to receive the blows of the hammer.

In the modification shown in Fig. II the shoulder d is dispensed with and a cup, L, adapted to fit over the end of a pile, as illustrated in

said figure, is secured to the rod. The rod E extends up through the head B of the cylinder, and is provided with a hoop or ring, e , to which the rope or chain f is attached, for the purpose of suspending the apparatus when desired, as illustrated in Fig. II.

F indicates a tubular piston-rod passing through the stuffing-box, and having the head or piston G secured to its upper end. To the lower end of the hollow piston-rod is secured a suitable weight or hammer, h' . The rope or chain which suspends the apparatus passes over a suitable pulley, g , and is held in any suitable manner, so that it will yield as the tube or pile is being driven, in order to admit of the descent of the apparatus.

When it is desired to operate the mechanism the same is suspended by suitable means, and the pipe that is to be driven is secured by means of coupling to the screw-threaded end of the rod E. The attaching may be facilitated by means of notches or projections provided in the screw-threaded coupling, with the aid of proper wrenches, or by means of notches for engaging an iron bar. The steam is allowed to pass in under the piston-head G, and the piston-rod and weight consequently raised. To allow the steam to pass into the cylinder it is necessary to turn the ring-valve by means of the handle c^4 until the valve meets a corresponding opening in the cylinder, and the steam is thus allowed to enter the cylinder until the weight is raised to the requisite height. When the ring-valve is turned to allow the entrance of the steam or compressed air under the head G the exhaust will be closed. When the proper time arrives for dropping the weight it will be only necessary to turn the ring-valve until the opening in the outlet or exhaust registers with the corresponding opening in the cylinder, at which juncture the weight immediately drops, (forcing the steam or compressed air out of the cylinder,) strikes the shoulder d , and drives the pipe home.

It is obvious that the stroke and consequent force of the weight may be greatly increased by means of a similar ring-valve provided at the upper end of the cylinder, and compressed air or steam be allowed to enter the cylinder above the head G at the proper moment to force down the hammer.

It is obvious that the stroke can be varied as often and rapidly as may be desired, and I have found in practice that in an apparatus constructed in accordance with my invention
5 I can drive a four-inch tube five inches each stroke, or a distance of one hundred feet in an hour where the soil is favorable, of course allowing time for coupling. When it becomes necessary to attach another joint of pipe the
10 shoulder can be simply uncoupled from the driven tube and another joint attached.

When I desire to drive piles I attach the cap L, as shown in Fig. II, and set the cap over the head of the pile. By this means the pile
15 will not be splintered and shivered, since the stroke is on the cap all the time and the head of the pile thus protected.

It is obvious in driving pipes for iron piers the same will be driven quicker and with better results than with the present system, in
20 which they suck the sand from around the tube to allow the same to sink, and by that means to loosen the walls around the same. When it becomes inconvenient to carry a very heavy
25 drop the force of the blow can be greatly increased by means of a compression of steam or air between the tubular piston-head and the head of the cylinder.

It is obvious that the ring-valve can be caused
30 to act automatically, and that either steam or compressed air can be employed.

To avoid the shock of the drop or hammer while being raised, I propose providing a rubber or other spring between the hammer and
35 cylinder.

From the foregoing it will be seen that either the cap or the shoulder at the lower end of the rod E constitutes a bed or cushion which receives the blows of the hammer, thereby avoiding all injury to the articles which are being
40 driven.

Having thus described my invention, what I claim is—

1. In a pipe or pile driving machine, a rod having a shouldered cap adapted to be secured
45 to the end of the pipe or pile to be driven, in combination with a suspended steam or air cylinder provided at one end with a controlling-valve, a piston within said cylinder, and a piston-rod having attached to its outer end a ham-
50 mer which is guided by the rod carrying the shouldered cap, substantially as described, for the purposes set forth.

2. The combination, with the cylinder, of the valve for admitting and exhausting steam or
55 compressed air into or from said cylinder, the tubular piston-rod and its piston within the cylinder, the hammer secured upon the tubular piston-rod, the rod passing through the tubular piston and provided with a shoulder or cushion
60 ion below the same, and at its upper end connected with the cylinder, substantially as described.

It witness whereof I have hereunto set my hand this 1st day of March, 1881.

JESSE BUTTON.

Witnesses:

CHAS. F. KOEHLER,
JOHN E. BURKE.