

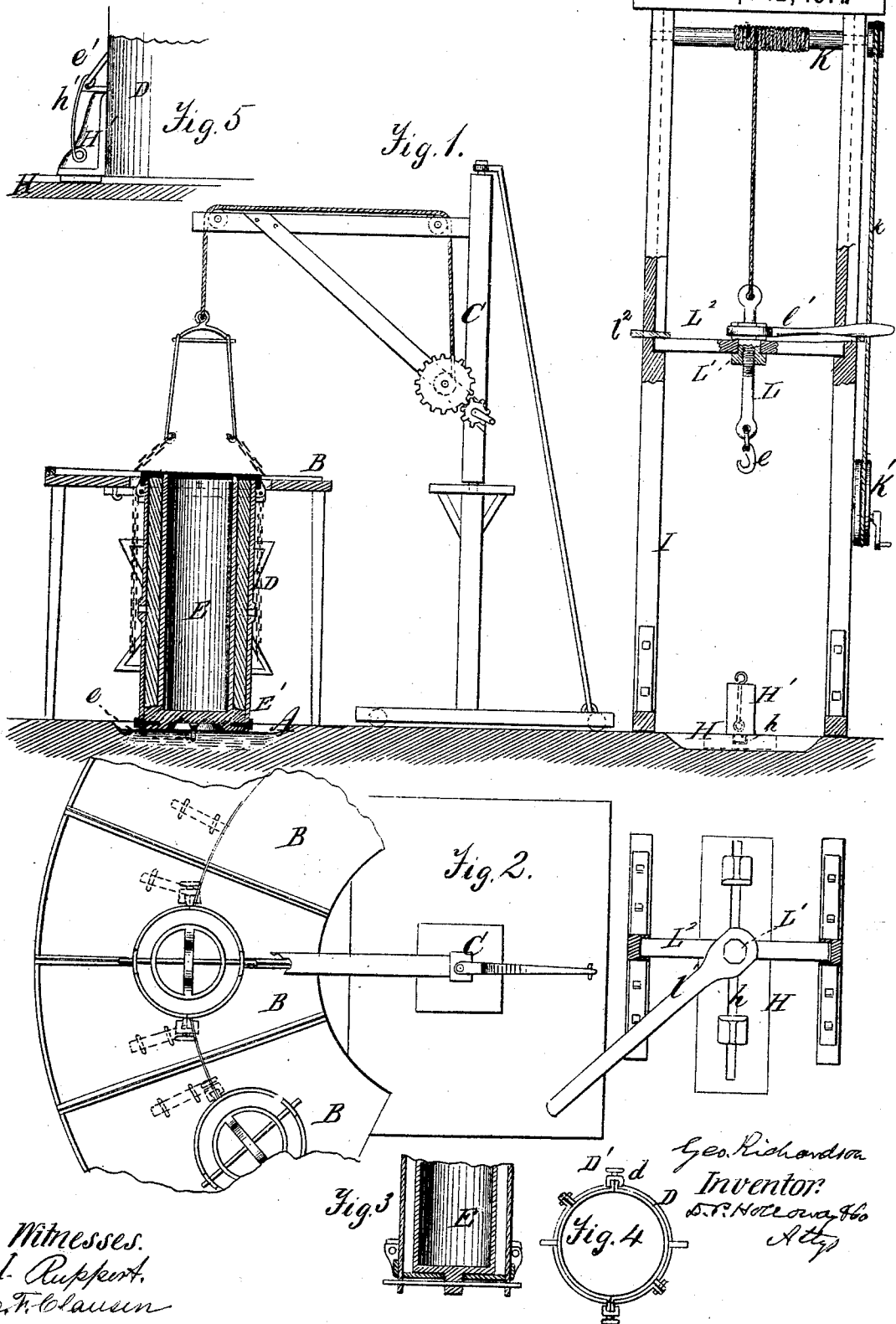
GEORGE RICHARDSON.

2 Sheets--Sheet 1.

Improvement in Drain Pipe Machines.

No. 118,880.

Patented Sep. 12, 1871.



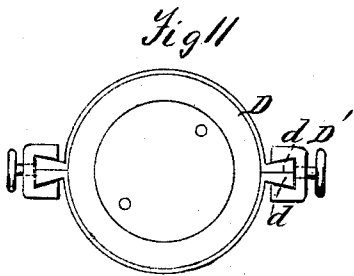
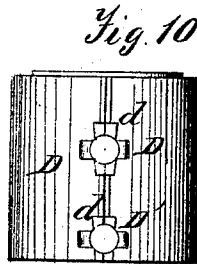
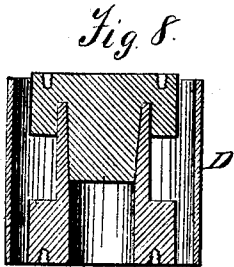
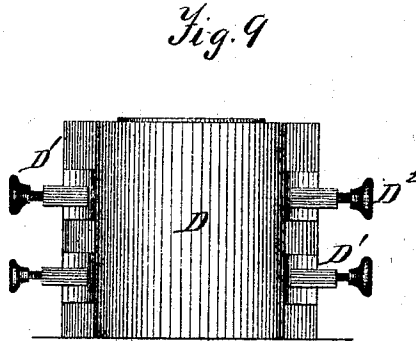
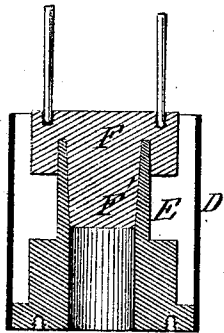
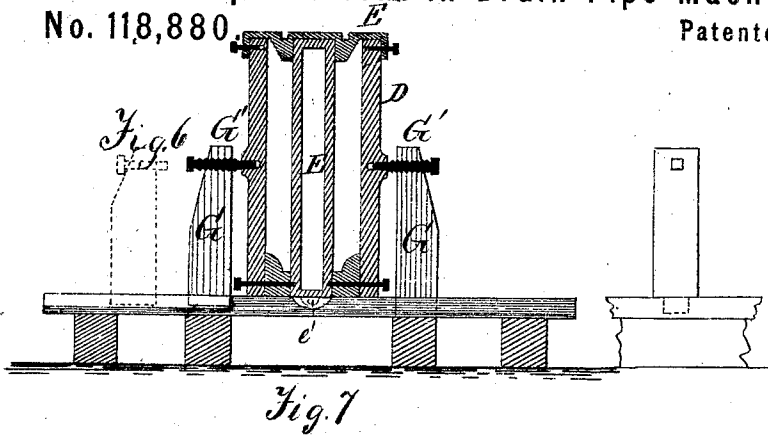
Witnesses.
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C. F. Clausen

Geo. Richardson
 Inventor
D. P. Holloway & Co
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Improvement in Drain Pipe Machines.

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Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE RICHARDSON, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN DRAIN-PIPE MACHINES.

Specification forming part of Letters Patent No. 118,880, dated September 12, 1871.

To all whom it may concern:

Be it known that I, GEORGE RICHARDSON, of the city and county of Milwaukee and State of Wisconsin, have invented certain Improvements in Machines for Molding Cement-Pipes, of which the following is a specification:

The nature of my invention consists in the construction, combination, and arrangement of certain parts of the apparatus, to be generally explained in the following description and specifically pointed out in the claims.

Fig. 1 represents a sectional elevation of an apparatus for molding cement-pipes, embodying my improvements. Fig. 2 is a plan view thereof. Figs. 3 to 13 represent views of details of the machine, which will be more specially referred to in the body of the following description.

The same letters of reference are employed in all the figures in the designation of identical parts.

The machine or apparatus is composed, in the main, of three parts—a platform, with suitable tables for sustaining the molds while the cement, clay, or other earthy matter is tamped into them; a crane for removing the mold-case, core, and pipe bodily from the platform and carrying them to a device for clamping the mold-case to the floor; and an elevated windlass for withdrawing the core out of the pipe and case.

The platform A, which supports the tables B, may be formed by the floor of the building in which the manufacture is carried on, or superimposed thereupon. In the latter case it is made of a sectoral shape and the tables arranged around upon it from one end to the other, the post of the crane C standing in the center of the arc, as shown in Fig. 2. The mold-cases are placed on end and steadied at the upper end by the respective tables, in which a suitable aperture is formed for that purpose. Where the leaf of the table surrounds the case upon all sides, such leaf should be made in two parts, the division line running diametrically through the aperture receiving the case; but in most cases it will be quite sufficient to steady the mold half-way around only, when the leaf of the table may be made in one piece, with a semicircular recess. The tables may be stationary and not touch the upper part of the mold, which latter, in such case, will be steadied near the top by a device such as shown in Fig. 13, similar to the one I

use to steady the core as it is being withdrawn from the pipe and mold-case, and which will be more fully described hereinafter. The mold-cases D are composed of two sections of required length, and upon each section tapering lugs *d d* are formed on each side, corresponding with similar lugs upon the other section, as best seen in Figs. 4, 10, and 11. These lugs are widest at the top and gradually diminish in width toward the lower end, as best illustrated in Fig. 10, so that the clamps *D*¹, slipped over the lugs from the bottom and firmly secured thereto by set-screws *D*², can be used in connection with such set-screws as handles for manipulating the mold-case. The lugs are also of dovetailed form in cross-section, so that the clamps corresponding to that form, as shown in Figs. 11 and 12, cannot be removed by a lateral or horizontal pull. The core E I prefer to construct with a circumferential flange, *E'*, at the lower end, as shown in Fig. 1, of equal diameter with the aperture of the mold-case which encompasses it, and may be secured to the flange during the molding process by screws. This flange will steady the core and case, with reference to one another, at the lower end, and at the upper end a notched cross-bar or other suitable device may be employed for that purpose. The flange also forms and supports the lower end of the pipe while in the mold. Other devices, such, for instance, as are shown in Fig. 3, may be employed for forming the lower end of the pipe and holding the case and core centrally with reference to each other; and where one end of a pipe must be reduced in size so as to allow it to enter a socket in another, a device like that shown in Fig. 6 may be used to form this tenon or smaller end of the pipe. In forming pipes of this kind a socket must be made in the other end, and this I accomplish by the use of a plate, *E*², with an annular bead or collar in form like the socket to be made, by impressing it in the mortar upon its under side, as shown in Fig. 6, and with a shoulder or series of projections for embracing the mold-case. It will be observed that the depth of the socket, in using this form of core *E*², will always be uniform, which result cannot be obtained by means of a simple ring without any provision for stopping its entrance into the mortar. In making couplings, which are simply short ends of straight pipe with a square socket in each

end, I intend using a core such as shown in Figs. 7 and 8 for forming one of the sockets. This core F has a central shank, F', which enters the bore of the hollow core E, the upper end of which passes into an annular groove in the under side of the core-piece F, as clearly shown. The core I propose drawing out and upward from the bottom of the mold-case, and it becomes necessary, therefore, to turn the latter upside down. To this end I hang it on trunnions G', which have their bearings in suitable standards, G, as seen in Fig. 6. The standards are adjustable, so as to admit different sizes of molds. In the bottom end of the core E a bail or ring-bolt, e, is securely fastened, to serve for the attachment of the hook of the crane C in removing the mold to the place where the core is to be withdrawn, and also as a device for hooking onto in pulling out the core. The mold-case, with the pipe and core in it and closed at each end, as shown in Fig. 6, is carried by the crane to the platform H and deposited thereon, bottom side up, between adjustable standards H', which slide in a guide, h, as shown in Figs. 1 and 2. Each mold-case is constructed with a perforated ear or hook, e', as seen in Fig. 5, upon each side with which it rests upon the top of the standards H', and is firmly secured thereto by a staple-hook, h', so as to hold the mold-case firmly down while the core is being withdrawn. Instead of resting the mold-case on the standards H' it may be placed directly upon the platform or base H, and the hooks h' fastened to the latter; but the preferred method is that heretofore explained. Over the platform H a frame-work or gallows, I, is erected, carrying in the upper part a windlass, K, which may be operated from a pulley, K', by means of a belt, k, or in any other preferred manner. From the drum of the windlass a rope or chain is suspended and fastened at the lower end to a bolt, L, which, after passing through a nut, L', in a cross-head, L², terminates in a hook, l, with which to take hold of the ring-bolt e on the core E. It is exceedingly difficult to start the core from the pipe by a direct pull; and, in order to thus start the core, I form a screw-thread on the bolt or bar L, taking into the female threads in the nut L'. The latter is revolved in the cross-head L² by means of a wrench, l', or other device, but has no vertical motion, and the cross-head being also held stationary while the nut is operated, it will draw the bar L up, and, as thus a great power can be exerted, the core may be readily started. The cross-head L² slides with its ends in guides cut in the timbers of the frame I, and may be

held stationary, during the operation of starting the core, by pins l², as shown, or by any other convenient means. In the act of pulling out the core the lower end of the mold will be steadied by the platform and standards to which it is secured; but it is also desirable to steady the core as it is withdrawn. This I accomplish by means of a ring, M, Fig. 13, constructed with arms m m', which ring is slipped over the core—a series of rings being kept in reserve to fit different-sized cores—its arms projecting into grooves or guides cut in the upright timbers of the frame I. When the core is constructed with a flange it will be necessary to make this ring in two parts, hinged together, so that they may be opened and clasped around the core below the flange as soon as it is drawn out far enough to receive the ring.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement of the mold-case D, core E, trunnions G', and adjustable standards G upon a suitable base, in the manner and for the purpose set forth.

2. The combination of mold-case D, core E, and end-inclosing and securing devices, substantially as and for the purpose set forth.

3. The combination, with the mold-piece D, of the shanked core-piece F F' and hollow core E, operating substantially in the manner set forth.

4. The arrangement, upon the sectional mold-case D, of the dovetailed tapering lugs dd, clamps D¹, and set-screws D², in the manner and for the purpose set forth.

5. The mold-case, constructed with ears e', in combination with the adjustable standards H' and hooks h', substantially as set forth.

6. The combination, with core E, of the cross-head L², screw-threaded bolt or bar L, and nut L', constructed and arranged to operate substantially as and for the purpose set forth.

7. The combination, with core E, of the standards H' and hooks h' for securing the mold-case, the windlass K with rope or chain, frame I, bar L, and cross-head L², all arranged to operate substantially as set forth.

8. The ring M with arms m m', in combination with the frame I and core E, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. RICHARDSON.

Witnesses:

D. P. HOLLOWAY,
B. EDW. J. ELLS.

(15.)