(No Model.) 2 Sheets—Sheet 1.

J. J. POWERS & R. VAN BUREN.

CLAY CONDUIT MACHINE.

No. 478,462. Patented July 5, 1892.

Fig. 1

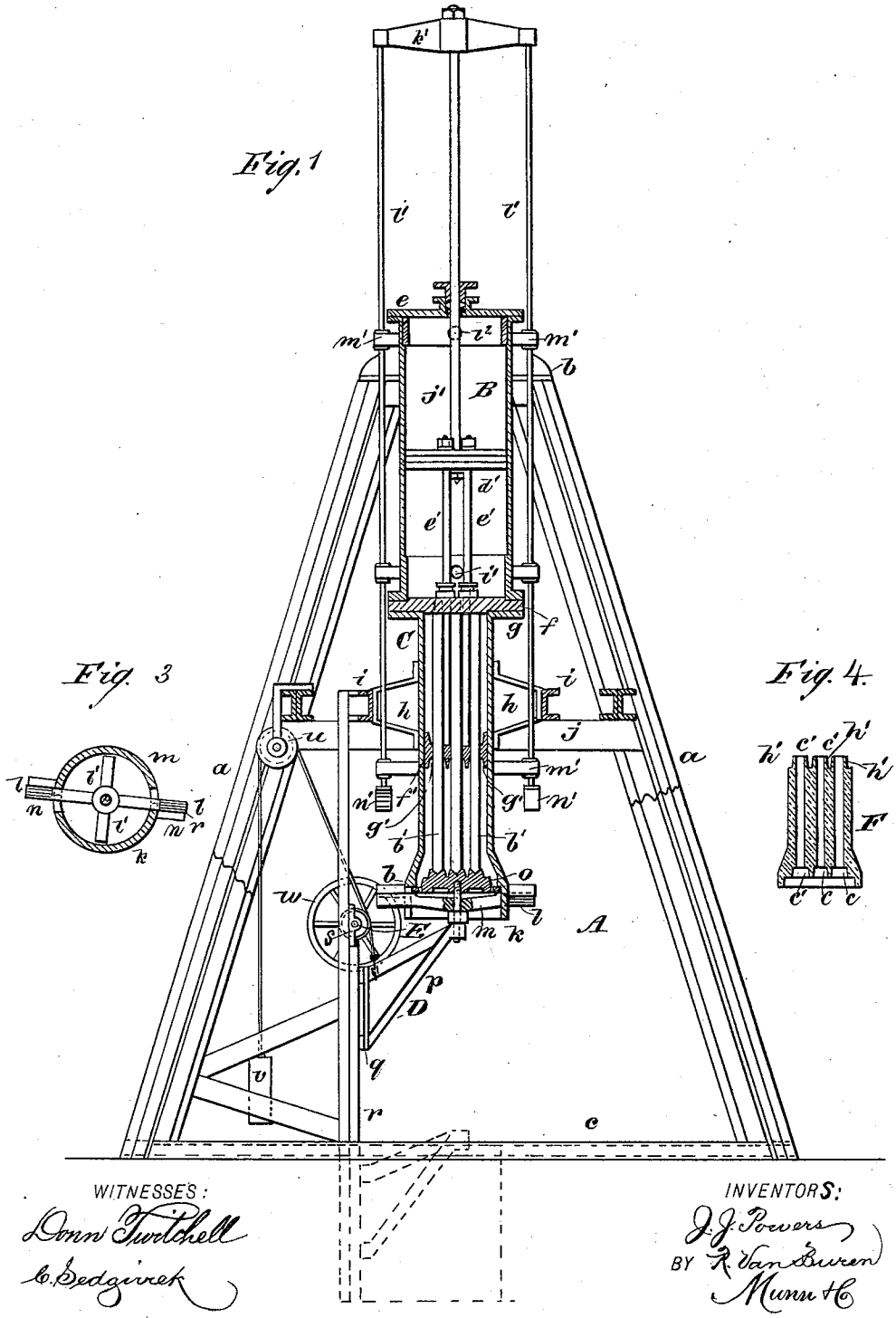

Fig. 3

Fig. 4.

WITNESSES:

Donn Twitchell

C. Sedgwick

INVENTORS:

J. J. Powers

BY R. Van Buren

Munn & Co

ATTORNEYS

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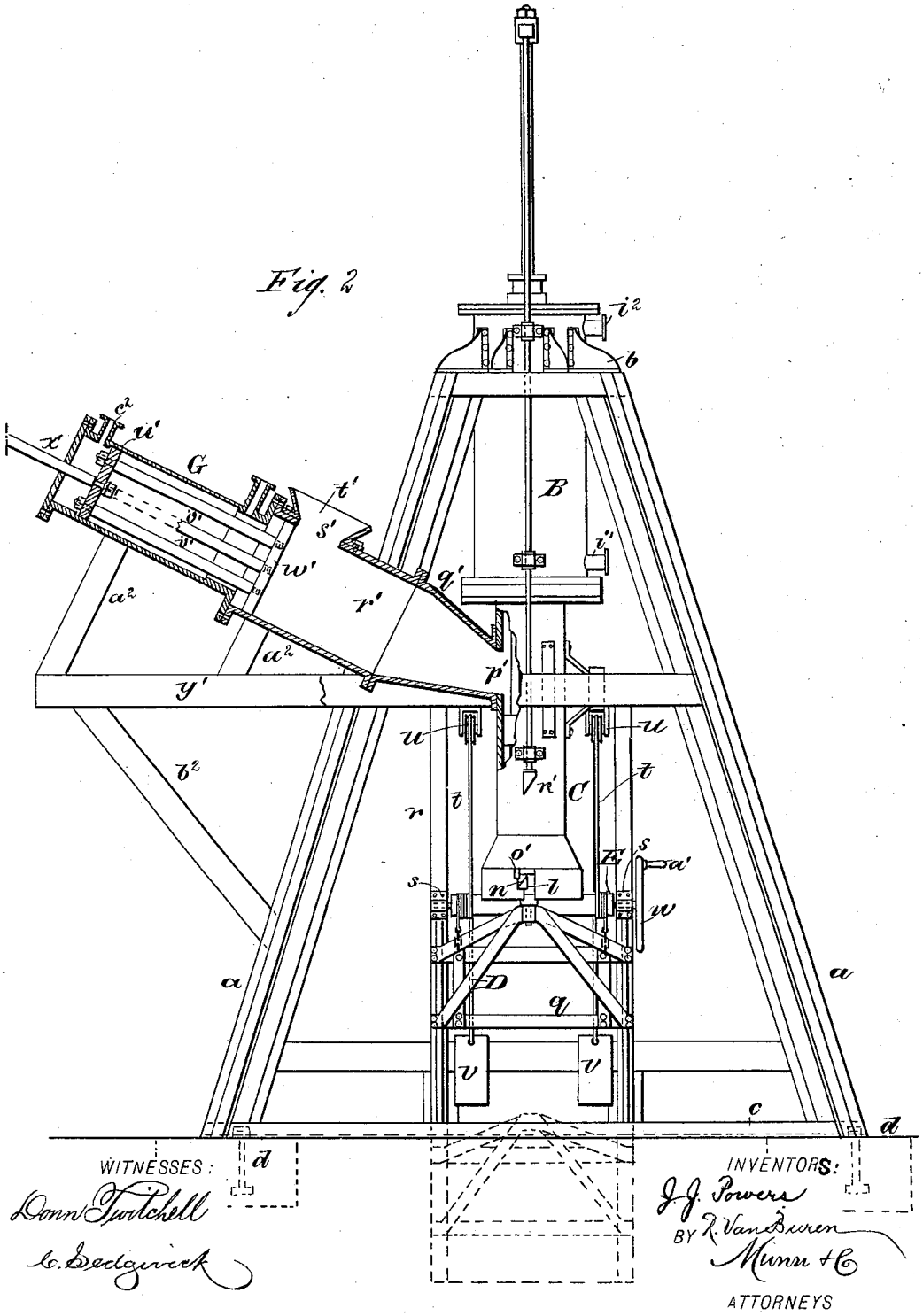
Fig. 2



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UNITED STATES PATENT OFFICE.

JAMES J. POWERS AND ROBERT VAN BUREN, OF BROOKLYN, NEW YORK.

CLAY-CONDUIT MACHINE.

SPECIFICATION forming part of Letters Patent No. 478,462, dated July 5, 1892.

Application filed October 15, 1891. Serial No. 408,758. (No model.)

To all whom it may concern:

Be it known that we, JAMES J. POWERS and ROBERT VAN BUREN, both of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Machine for Making Clay Conduits, of which the following is a specification, reference being had to the annexed drawings, forming a part thereof, in which—

Figure 1 is a side sectional elevation of our improved machine. Fig. 2 is a front elevation partly in section. Fig. 3 is a plan view of the head-supporting spider, and Fig. 4 is a longitudinal section of one section of the conduit.

Similar letters of reference indicate corresponding parts in all the views.

The object of our invention is to construct a simple and efficient machine for the economical working of clay conduits for electrical wires and other uses.

The invention consists in the peculiar construction and combinations of parts as hereinafter described, and pointed out in the claims.

The frame A of the machine consists of the four corner-posts *a*, attached to a collar *b* at their upper ends and secured to a base-plate *c* and girders *d* at their lower ends. The corner-posts *a* are inclined inwardly at the top, giving the frame a pyramidal form. In the collar *b* is placed the hydraulic cylinder B, which is flanged at its upper and lower ends. To the upper end is attached the head *e*, and to the lower end is secured the head *f*, to which is attached the flange *g* of the molding-cylinder C.

The molding-cylinder C is provided at opposite sides with brackets *h*, to which are attached angle-beams *i*, which rest upon cross-beams *j*, attached to the corner-post *a* of the frame A. The lower end of the molding-cylinder C is flared and terminates in a short cylindrical section *k*, of larger diameter than the body of the cylinder. In the section *k* are formed angled notches for receiving the arms *l* of the spider *m*. The said spider consists of the arms *l* and *l'*, the arms *l* extending beyond the periphery of the part *k* and being provided with inclined faces *n*, as shown in Fig. 2. The fastening of the spider in the lower end of the molding-cylinder is of the kind known as the "bayonet-joint." The spider *m* supports the resistance-head *o*, and the spider itself is supported by an elevator D, consisting of the bracket *p*, attached to the slide *q*, traveling upon vertical guides *r*. The windlass E, journaled in boxes *s* on the vertical guides *r*, receives a pair of ropes or chains *t*, which are attached to the slide *q*, wound around the drum of the windlass, and extend over pulleys *u*, supported by the frame A, and are attached to the counterweights *v*. The windlass E is provided with a hand-wheel *w*, having a crank-handle *a'*, by which it may be turned.

In holes in the head *f* are inserted rods *b'*, which extend downwardly toward the lower end of the cylinder and are provided with conical ends which enter corresponding cavities in the resistance-head *o*, and in the said head around the cavities are made angular spaces for forming recesses *c'* in the end of the conduit-section F. (Shown in Fig. 4.

In the hydraulic cylinder B is placed a hydraulic piston *d'*, which is connected by two piston-rods *e'* with the piston *f'* in the molding-cylinder C. The said piston *f'* is provided with angular recesses *g'* for forming the tubulated ends *h'* of the conduit-section F. The hydraulic cylinder B is provided with lateral pipe connections *i'* *i²*, for receiving water under pressure. The piston-rods *e'* are made to pass through stuffing-boxes on the head *f*, to allow water to enter underneath the piston *d'* without escaping to the molding-cylinder. The piston-rod *j'*, connected with the center of the piston *d'*, extends through a stuffing-box in the head *e* of the cylinder B, and is connected with a yoke *k'*, which carries the rods *l'*, extending downwardly through guides *m'* on the sides of the cylinders B C. The lower ends of the rods *l'* are provided with beveled blocks or wedges *n'*, which, as the hydraulic and molding pistons descend, enter the space between the beveled ends *n* of the spider-arms *l* and the lugs *o'*, projecting from the sides of the molding-cylinder C, thereby turning the spider and releasing the arms.

In the side of the molding-cylinder C is formed an opening *p'*, which is covered by the flaring tube *q'*, to the outer and larger end of which is attached the filling-cylinder *r'*, the said filling-cylinder being provided with an opening *s'* in its upper side and with

a hopper t', communicating with the said opening. To the upper end of the cylinder r' is secured a hydraulic cylinder G, containing a piston u', which is connected by rods v' with the follower w' in the filling-cylinder r'. The piston u' is provided with a piston-rod x', which extends through the upper head of the cylinder G. The filling-cylinder r' and the hydraulic cylinder G are supported by beams y' and struts a^2, the beams y' being stayed by braces b^2.

The operation of our improved machine is as follows: The piston d' being forced into the upper part of the cylinder B, drawing the piston f' above the opening p', and the resistance-head o being in place and sustained by the arms l in the manner already described, and the piston u' being drawn up into the upper end of the cylinder G, with the follower w' in the upper part of the filling-cylinder r', the prepared clay is introduced into the cylinder r' through the hopper t' until it is entirely filled with the loose material, when water under pressure is admitted to the upper end of the cylinder G through a pipe attached to the tube c^2, forcing the piston u' and the follower w' downward toward the molding-cylinder C, thereby delivering the material to the molding-cylinder. Water is introduced into the upper part of the cylinder B through the tube i^2, thereby forcing the piston d' downward, thus carrying the piston f' downward and causing it to exert a pressure upon the clay contained in the molding-cylinder, so that it is forced around the rods b' and into the spaces in the piston and resistance-head o. When the piston f' approaches the completion of its downward stroke, the wedges n' enter between the beveled ends n of the arms l and the lugs o', causing the spider m to turn sufficiently to release the arms l from the angled notch in the lower part of the molding-cylinder C. The pistons d' f' continue their downward motion, thus discharging the molding-cylinder C. The holes left by the rods b' form the longitudinal passages of the electrical conduit, and when the compressed clay is discharged from the molding-cylinder C it has the form indicated in Fig. 4, requiring only drying, baking, and glazing to render it a perfect conduit-section. The unfinished section is then removed from the head o and the head is returned to its position in the molding-cylinder C, and secured by turning the arms l in the manner already described.

The movement of the spider m and the resistance-head o is effected by the elevator D and windlass E. By admitting water to the lower end of the cylinder B through the tube i', the pistons d' f' are raised and the machine is ready to receive another charge of material. The head f is adapted to receive the rods b', of different sizes and different diameters, and different heads are supplied for conduits of different forms.

The molding-cylinder C may be round in cross-section, as shown in the drawings, or it may be square or made in any other desired form.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a machine for making clay conduits, the combination, with a power-cylinder, a molding-cylinder below the same, pistons in the said cylinders and connected together, a spider locked to the lower end of the cylinder by a bayonet-joint, and means for releasing the spider by the descent of the said pistons, of an elevator connected to the spider and sliding on the frame, a drum, and ropes or chains connected to the elevator, wound on the drum, passed over guide-pulleys, and having weights at their ends, substantially as herein shown and described.

2. In a machine for making clay conduits, the combination, with a supporting-frame, a power-cylinder mounted in the upper part of the frame, a molding-cylinder below the power-cylinder and having a flaring lower end, pistons in the said cylinders and connected together, a spider locked to the flaring end of the said cylinder by a bayonet-joint, and means for releasing the spider by the descent of the said pistons, of the elevator D, sliding on vertical guides r on the frame, the windlass E, mounted on the said guides and provided with the handle a', guide-pulleys u on the frame, and ropes t, secured to the elevator, wound around the windlass, passed over the guide-pulleys, and provided with the weights v, substantially as herein shown and described.

3. In a machine for making clay conduits, the combination, with a vertical molding-cylinder, of an inclined filling-cylinder communicating with the molding-cylinder near the top and provided with a hopper, a follower in the filling-cylinder, a hydraulic cylinder connected with the filling-cylinder, and a piston in the hydraulic cylinder and connected by rods with the follower in the filling-cylinder, substantially as herein shown and described.

JAMES J. POWERS.
ROBERT VAN BUREN.

Witnesses:
HENRY STORY,
HENRY A. MEYENBORG.