

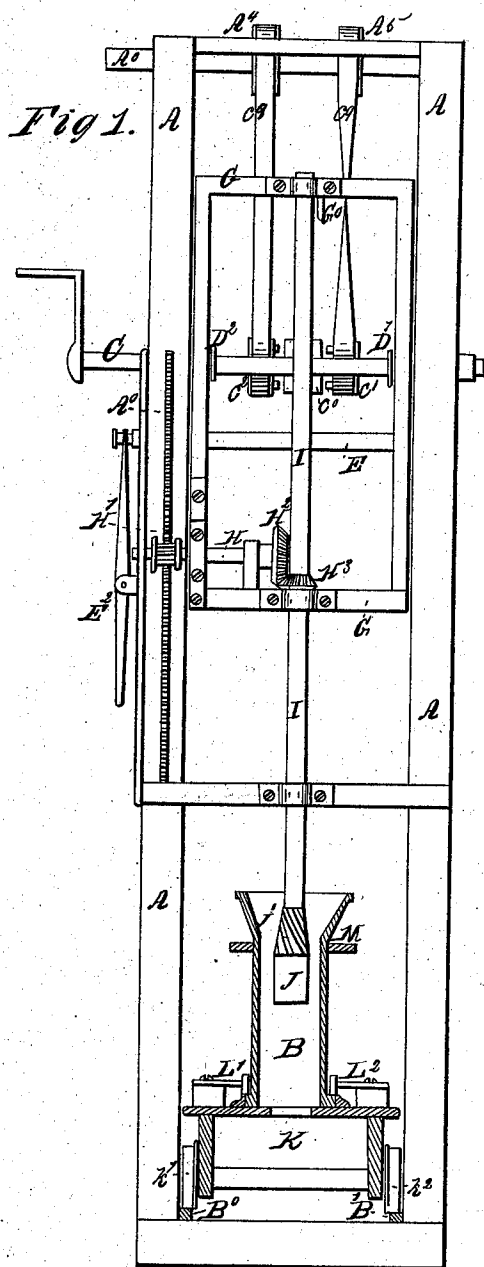
W. Smith,

55 sheets, Sheet 1.

Molding Pipe.

No 83,668.

Patented Nov. 3, 1868.



Witnesses.

Saml Bridge
Percival Beckett

Inventor.

William Smith

W. Smith,

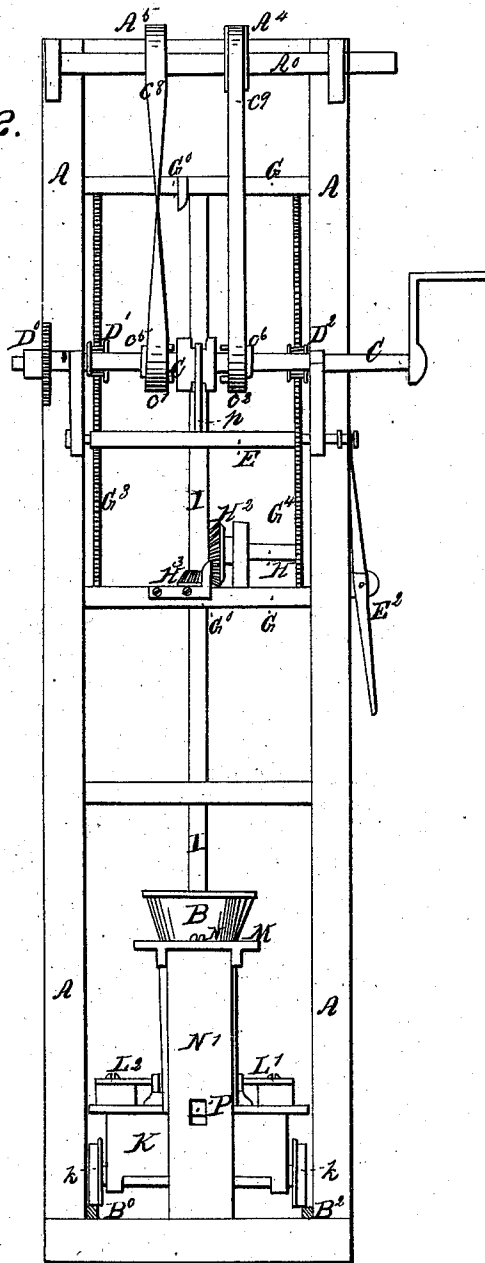
55 sheets, Sheet 2.

Molding Pipe.

N^o 83,668

Patented Nov. 3, 1868.

Fig 2.



Witnesses.

Samuel B. B. B.
Oswald B. B. B.

Inventor.

William Smith

W. Smith,

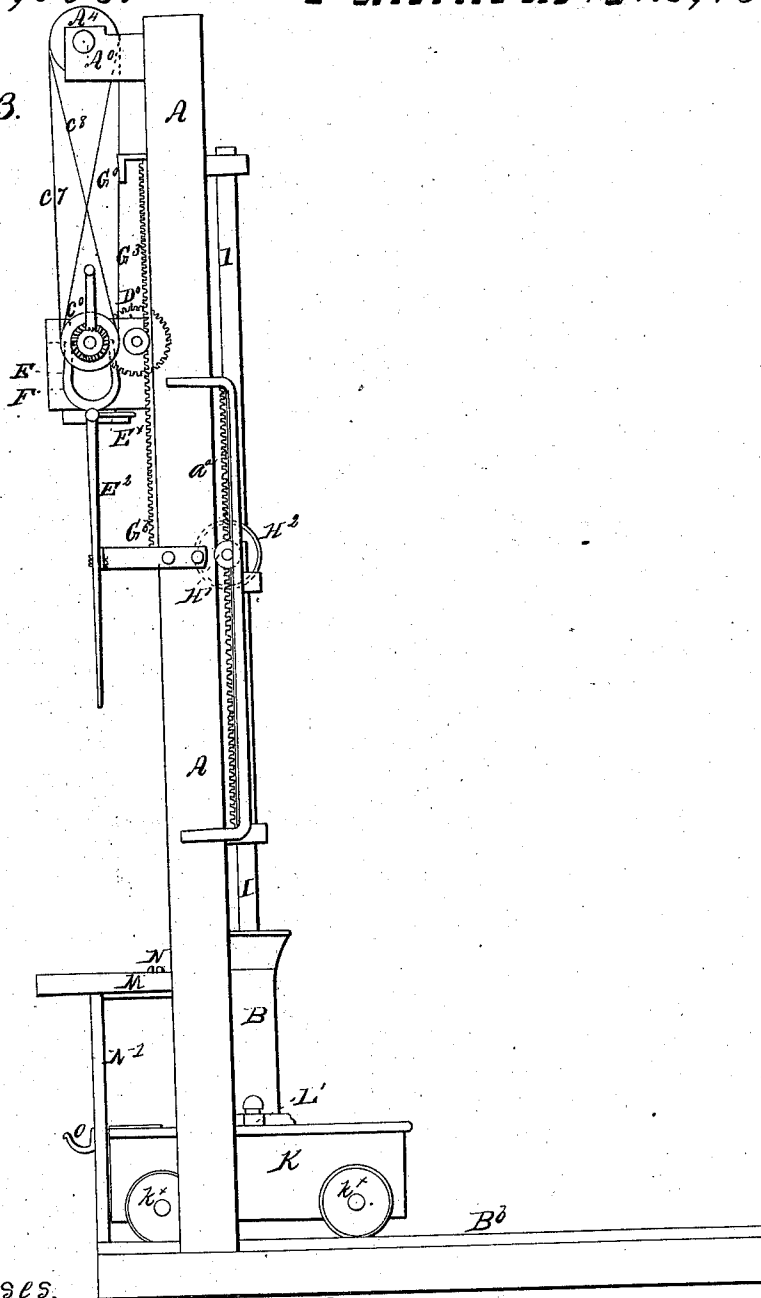
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Molding Pipe.

N^o 83,668.

Patented Nov. 3, 1868.

Fig 3.



Witnesses.

Samuel Bridge Jr.
Oswald Beckett

Inventor.

William Smith

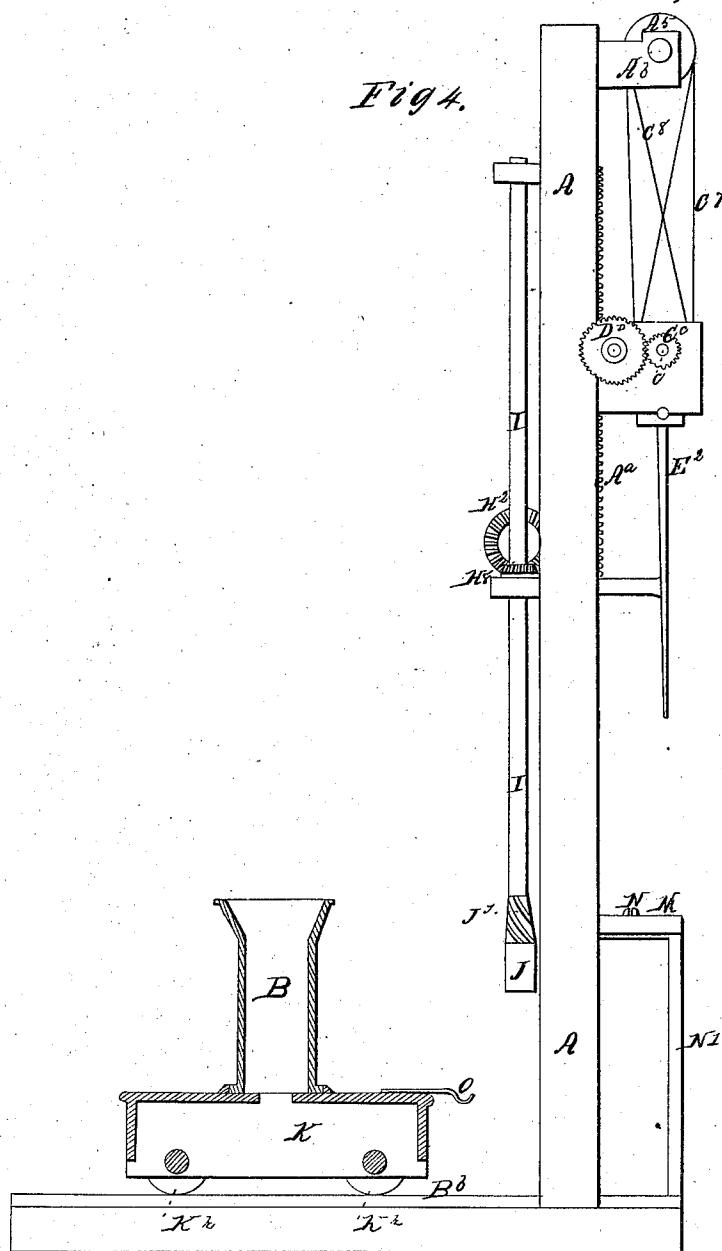
W. Smith,

5 Sheets, Sheet 4

Molding Pipe.

No 83,668.

Patented Nov. 3, 1868.



Witnesses.

Saml Bridge
Lucas Beckett

Inventor.

William Smith

W. Smith,

5 Sheets, Sheet 5.

Molding Pipe.

No 83,008.

Patented Nov. 3, 1868.

Fig 5.

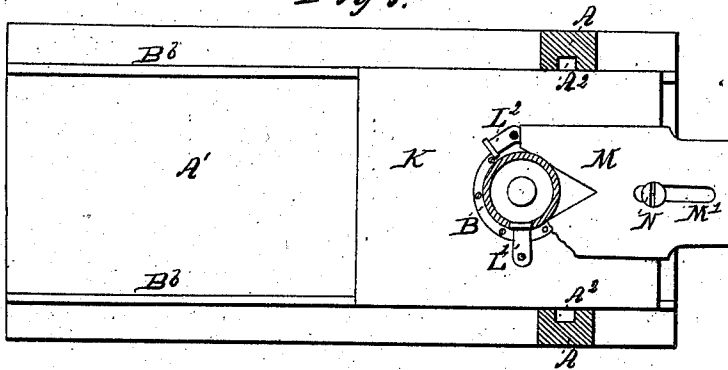


Fig 6.

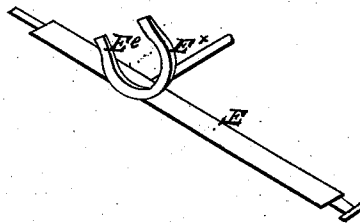
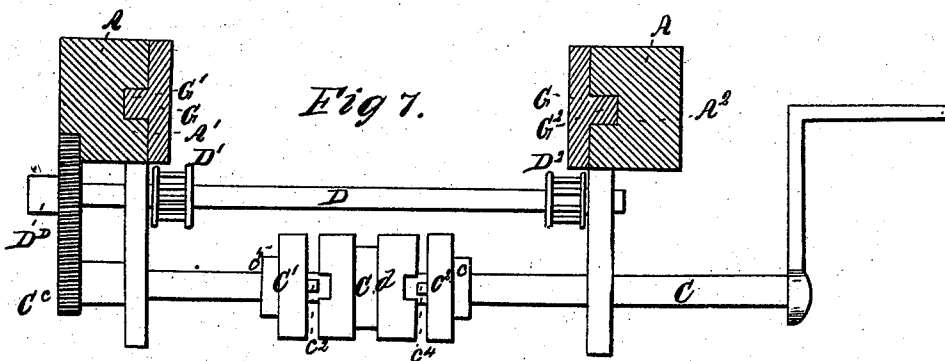


Fig 7.



Witnesses.

Saml Bridge Jr.
Perceval Beckett.

Inventor.
William Smith.

United States Patent Office.

WILLIAM SMITH, OF ALLEGHENY CITY, PENNSYLVANIA.

Letters Patent No. 83,668, dated November 3, 1868.

IMPROVEMENT IN PIPE-MOULDING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM SMITH, of Allegheny City, in the county of Allegheny, and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Moulding Cast-Iron Pipe, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which make part of this specification, and in which—

Figure 1 represents an end elevation of my improved pipe-moulding machine, the flask and carriage being shown in section;

Figure 2, a view in elevation of the same, taken from the opposite end;

Figure 3, a side elevation of the same;

Figure 4, a similar view, taken from the opposite side;

Figure 5, a horizontal section of the same;

Figure 6, a view, in perspective, of the shaft by which the movement of the carriage is reversed; and

Figure 7 a plan view, on an enlarged scale, of a portion of the mechanism, showing the arrangement of the counter-shafts C and D.

My invention relates to that class of pipe-moulding machines in which sand is packed in a vertical flask by a packer attached to the lower end of a shaft, which has a rotary as well as an upward and downward motion, and its object is to provide suitable means for communicating these motions to the packer-shaft, and reversing the vertical motion thereof at the proper periods, as well as to hold the flask firmly in position while the sand is being packed; to which ends my improvements consist in mounting the packer-shaft in bearings on a sliding carriage, which moves vertically in grooves or ways in an upright frame, at or near the top of which is mounted the driving-shaft.

Motion is communicated from the driving-shaft to a counter-shaft, upon which are two loose pulleys connected with pulleys on the driving-shaft by straight and crossed belts, respectively, either pulley of the counter-shaft being made fast thereon, and caused to revolve therewith, at pleasure, by an arrangement hereinafter to be described, so that the counter-shaft will revolve in the same or a contrary direction to the driving-shaft, according as one or the other pulley of the former is made fast thereon.

The counter-shaft is connected by gearing with a second counter-shaft, which carries pinions which engage racks upon the sliding carriage, and thereby impart vertical motion thereto, fixed stops being secured upon the carriage, which throw the pulley of the first counter-shaft out of operation, at each extremity of the travel of the carriage, by causing the former to be loose upon its shaft, and thereby stop the machine at these points.

A horizontal counter-shaft, carrying a spur-pinion upon one end, and a bevel-pinion upon the other, is mounted in bearings on the carriage.

The spur-pinion of this shaft gears with a rack se-

cured upon the upright stationary frame, and the bevel-pinion with a similar bevel-pinion upon the packer-shaft, rotary motion being thereby imparted to the latter during the upward and downward motions of the carriage.

The flask, which is borne upon a car running on rails at the base of the apparatus, is held thereon by means of pivoted clamps, having friction-rollers upon their free ends, which friction-rollers press upon a flange at the bottom of the flask, said flange resting within a circular flange upon the carriage, the carriage being held in position by a bent spring attached thereto, which enters a slot in a stationary rest or standard secured to the base of the machine.

In the accompanying drawings, which show a convenient arrangement of parts for carrying out the objects of my invention, A A represent a stationary vertical frame, to which the mechanism is attached. In this instance, the frame is shown as erected upon a base-plate, A¹, but in practice it is usually set up in a pit, to the floor of which the top of the base-plate corresponds, and the depth of which is about equal to the distance between the floor and the top of the flask.

A driving-shaft, A², upon which pulleys, A⁴ A⁵, are keyed or otherwise secured, is mounted in bearings at or near the top of the frame A, and a counter-shaft, C, is likewise mounted in bearings thereon, some distance below it.

The counter-shaft C carries two loose pulleys, C¹ C², which are prevented from moving endwise by collars, C³ C⁶, secured upon the shaft, and by shoulders thereon.

The counter-shaft C likewise carries a clutch, C⁴, which is placed between the pulleys C¹ and C², and can be moved longitudinally upon a feather formed on the shaft, but not rotated independently thereof.

A groove is formed all round the periphery of the clutch C⁴, and slots are made in each of its ends.

Pins or keys, C⁵ C⁷, are inserted into and project from the inner sides of the pulleys C¹ C², toward the clutch, in such manner that when the latter is moved along the counter-shaft into sufficiently close proximity to either of the pulleys, the pins thereof engage the slots upon the adjacent side of the clutch, and the pulley is thereby rendered fast upon the shaft.

When the clutch is thrown into connection with the pulley C², the counter-shaft will rotate in the same direction as the driving-shaft by means of the straight belt C⁷, and when thrown into connection with the pulley C¹, it will rotate in a contrary direction by means of the crossed belt C⁸.

The clutch is shifted, when necessary, by means of a yoke, E⁶, upon a horizontal shaft, E, mounted in bearings upon the frame, which yoke enters the groove in the clutch, and moves the latter in either direction, according to the movement of a shipper, E³, pivoted to the frame, and having its upper end suitably connected with the shaft E, so as to move the latter longitudinally in its bearings.

The shaft E is likewise provided with a horizontal arm, E², the object of which will be hereinafter described.

The counter-shaft C carries a spur-pinion, C², upon one of its ends, which gears with a similar pinion, D¹, secured upon a second counter-shaft, D, rotating in bearings upon the frame.

I represents a vertical packer-shaft, the bearings of which are secured to a sliding carriage, G, which moves up and down in the frame A, its motion being guided by tongues or projections, G¹ G², upon its sides, which enter corresponding grooves or ways, A¹ A², upon the frame, (figs. 5 and 7.)

The counter-shaft D carries pinions, D¹ D², which engage racks, G³ G⁴, upon the carriage, and thereby impart upward or downward motion thereto, according to the direction of rotation of the counter-shaft.

A catch, G⁵, is secured to the upper portion of the carriage G, and another catch, G⁶, to the lower portion, the working-faces of each being inclined planes, and set in such position that when the carriage has reached the lower extremity of its travel, the inclined face of the catch G⁵ strikes the yoke E², and throws the clutch C⁴ out of connection with that pulley of the counter-shaft C with which it may at the time be operating, and thereby stops the carriage. At the upper extremity of its travel, the carriage is stopped in a similar manner by the face of the catch G⁶ striking the arm E² of the shaft E.

A horizontal counter-shaft, H, is mounted in bearings upon the carriage G, having secured upon one of its ends a bevel-pinion, H², which gears with a similar pinion, H³, upon the packer-shaft I, and a spur-pinion, H¹, upon its opposite end, which gears with a rack, A³, upon the frame A.

By this means rotation is imparted to the packer-shaft during the upward and downward movements of the carriage.

J represents a cylindrical packer secured to the lower end of the packer-shaft, and having its upper portion made in the form of a frustum of a cone, with flukes, J¹, running spirally around it.

The flask B, of ordinary construction, is borne upon a car, K, running upon rails, B², upon the base-plate A¹, or, in practice, upon the floor of the pit.

The flask B rests within a circular flange upon the car and is held firmly in position for packing by means of clamps, L², pivoted to the car, and having friction-rollers upon their free ends, which, when turned into position, press upon a flange at the bottom of the flask, and hold it firmly down upon the car. The latter is held in position, while the sand is being packed in the flask, by a bent spring, O, secured to its top, which passes through an opening in a vertical standard, N², upon the base-plate, and holds the car in connection therewith, releasing it when raised.

A rest, M, is attached to the top of the standard N² by a set-screw, N, passing through a slot, M¹, in the rest. The latter has an angular opening in its end, against the sides of which the upper portion of the flask rests, and, by means of the slot M¹ and set-screw N, its position can be regulated to suit the diameter of the flask employed.

The operation of the machine is as follows:

The carriage G being at the upper end of its path

or travel, the flask B is placed upon the car K, and fastened thereon by the clamps L². The car is then pushed along the rails B² until the flask stands beneath the packer-shaft, and concentric therewith, in which position it is fastened by the bent spring O and standard N², the upper part of the flask resting in the opening of the rest M. The clutch C⁴ is then thrown into connection with the pulley C¹, and motion imparted to the driving-shaft in the direction of the arrows, which being communicated to the carriage G through the counter-shafts C D, pinions C² D¹, D² D¹, and racks G³ G⁴, as hereinbefore described, the carriage moves downward until the packer J reaches the bottom of the flask B, when the catch G⁵ strikes the yoke E², and, throwing the clutch C⁴ out of connection with the pulley C¹, stops the movement of the counter-shaft, and consequently that of the carriage. A sufficient quantity of sand being then put into the flask B, the clutch C⁴ is thrown into connection with the pulley C² by means of the shipper E².

The carriage G then commences its upward motion, the packer-shaft being rotated by means of the pinions H² H³ H¹, and rack A³, as before described. This operation continues until the packer has been raised clear of the flask, when the catch G⁶ strikes the arm E² of the shaft E, and again stops the carriage.

During the upward and rotary motion of the packer, its flukes, J¹, wedge the sand above them against the inside of the flask, while the lower cylindrical part of the packer smooths the sand upon the inside of the mould.

When the packer is raised clear of the flask, the car is released from the standard N², and pushed away, to allow of the removal of the flask, after which another can be clamped upon it, and the operation repeated.

I do not claim packing the sand in a flask by means of the rotation and upward movement of a packer, nor the particular form of packer employed, such improvements being comprehended in Letters Patent granted to me, October 15, 1867, and numbered 69,854; neither do I broadly claim the use of a vertically-moving carriage, nor a clutch engaging pins upon the sides of loose pulleys, as such devices have been heretofore known and used; but having thus fully described my invention,

What I claim therein as new, and desire to secure by Letters Patent, is—

1. A packer-shaft, mounted in bearings on a vertically-moving carriage, arranged and operating so as to communicate rotation to the packer-shaft during its vertical movements, substantially in the manner described.

2. The carriage G and racks G³ G⁴, in combination with the pinions D¹ D², counter-shafts D C, gear-wheel D⁴, pinion C², loose pulleys C¹ C², clutch D⁴, and driving-shaft A³, arranged and operating substantially as described, and for the purposes set forth.

3. The pivoted clamps L², having friction-rollers upon their ends, in combination with the car K and flask B, as set forth.

In testimony that I claim the foregoing as my own, I affix my signature, in presence of two witnesses.

WILLIAM SMITH.

Witnesses:

SAM'L BRIDGE, Jr.,
PERCEVAL BECKETT.