

C. Collier,

Tile Machine.

N<sup>o</sup> 63,784.

Patented Apr. 16, 1867.

Fig. 2.

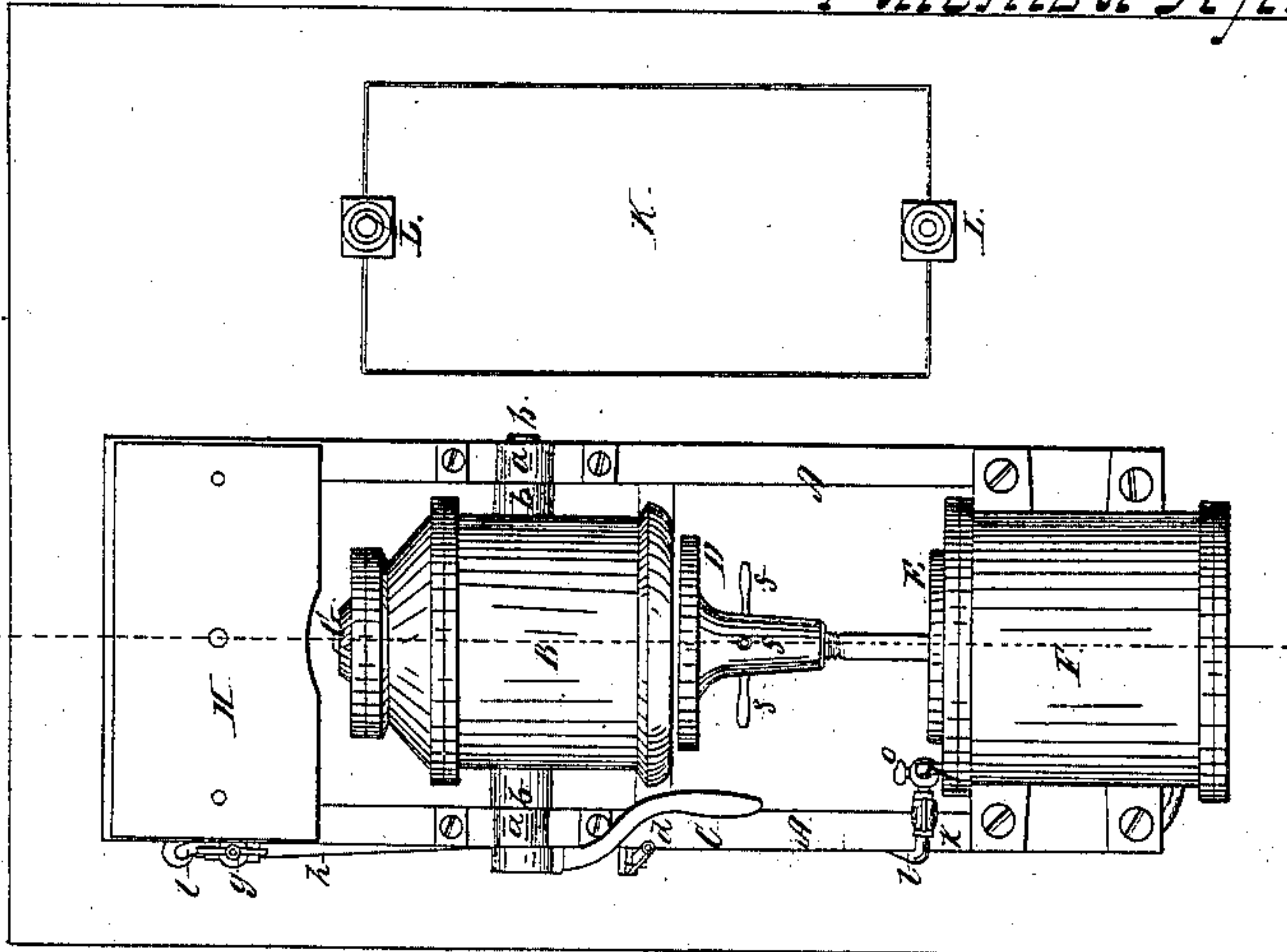
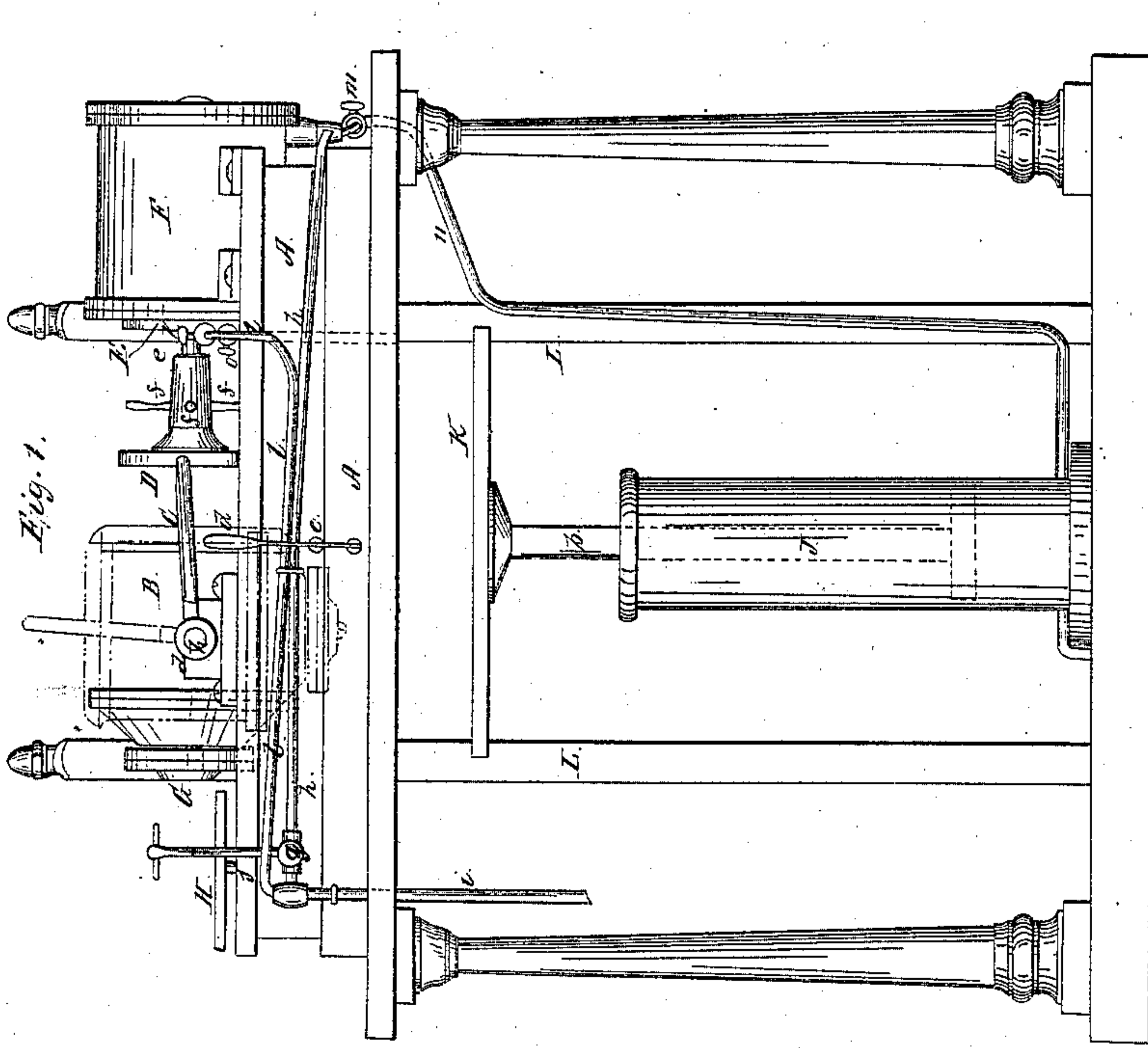


Fig. 1.



Witnesses:  
R. H. Sturges  
W. W. Stearns

Inventor:  
Charles Collier

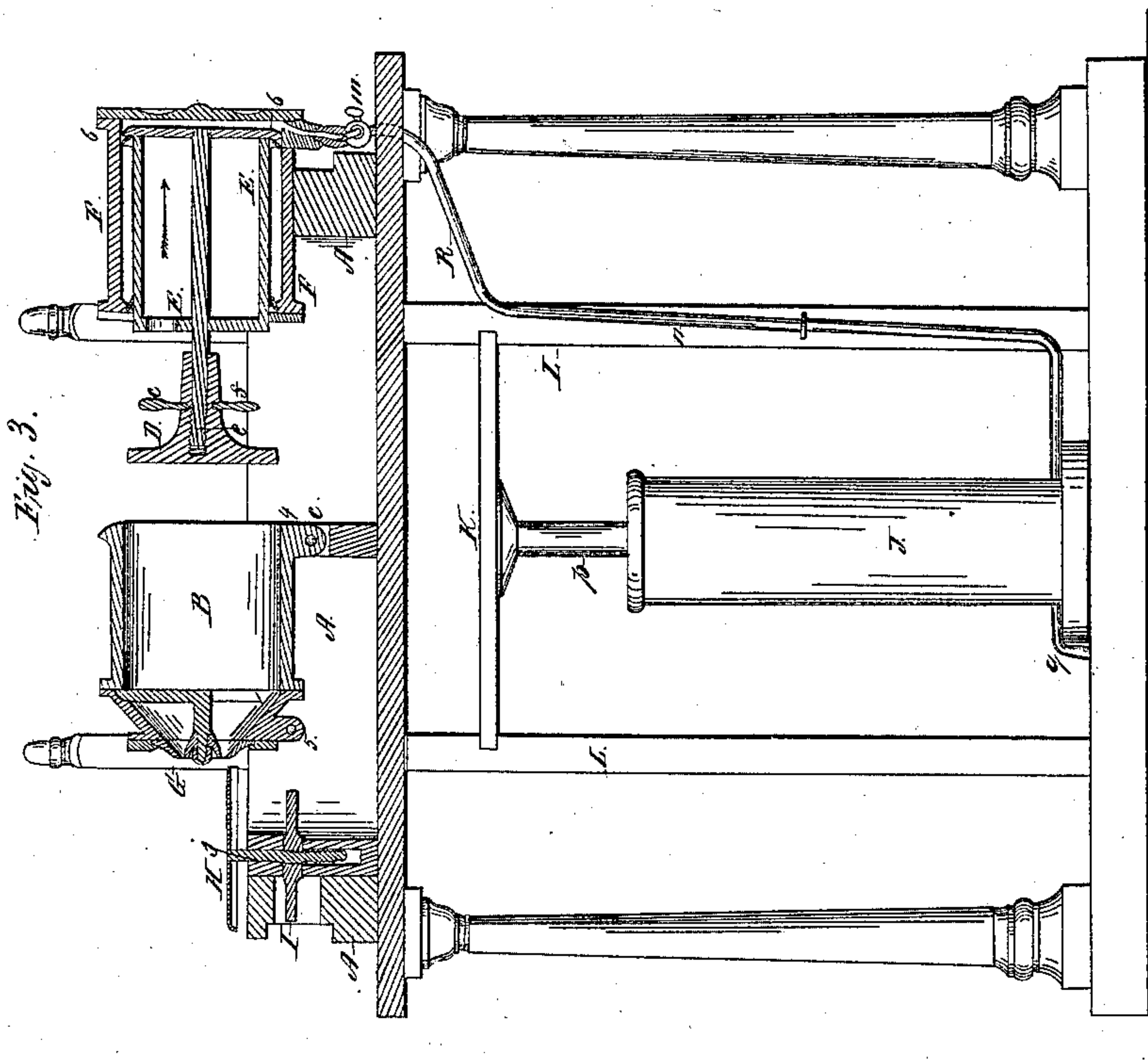
2 Sheets. Sheet 2.

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Witnesses:  
P. C. Toolemacher  
N. W. Stearns

Inventor:  
Charles Collier



# United States Patent Office.

CHARLES COLLIER, OF CHARLESTOWN, MASSACHUSETTS.

*Letters Patent No. 63,784, dated April 16, 1867.*

## IMPROVED MACHINE FOR MAKING DRAIN WATER PIPES.

*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, CHARLES COLLIER, of Charlestown, in the county of Middlesex, and State of Massachusetts, have invented a Hydraulic Machine for Making Drain, Soil, and Water Pipes or Tiles from clay, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of my improved machine.

Figure 2 is a plan.

Figure 3 is a longitudinal vertical section through the centre of the same on the line *xx* of fig. 2.

My invention consists in a new machine for manufacturing drain, soil, and water pipes or tiles from clay, which is operated by means of hydraulic pressure, the details and construction of which I will now proceed to describe in such terms that others skilled in the art may understand and use my invention.

In the said drawings, A is the bed of the machine, in bearings *a*, on which are placed the trunnions *b* of a cylinder, B, which receives the prepared clay from which the pipes are to be made. This cylinder may be turned on its trunnions, so as to bring it into a convenient position to receive the clay, as seen in red, fig. 1, by means of the handle C, and it is locked both in a vertical and horizontal position by means of a sliding-bolt, *c*, which passes through one of the projections 4 or 5, and is operated by the hand-lever *d*. D is a piston or plunger, which is turned to fit the interior of the cylinder B, and is screwed on to the end of a rod, *e*, which projects from the piston E of a hydraulic ram secured to the bed A. This piston is made hollow, and extends beyond the end of the cylinder F, being provided with a flange, 6, fig. 3, against which the water acts to force the piston in the direction of the red arrow. The piston D is revolved by means of the handles *f*, so as to run it back on the screw-rod *e*, as seen in figs. 1 and 3, to allow the cylinder B to be raised into an upright position, as seen in red, fig. 1, when it is to be filled with clay; and when it is returned into a horizontal position, as seen in black, the piston D is moved forward on the rod *e* into contact with the clay, this arrangement enabling me to shorten the hydraulic cylinder, and thus economize water. The cylinder B having been filled with clay and returned to its horizontal position, the operator opens the valve *g* in the pipe *h*, which admits water under pressure from the supply pipe *i* into the cylinder F behind the piston E, forcing the piston or head D against the clay in the cylinder B, which is thus ejected through the orifice or mould G at its rear end, the form of which is such as to make the pipe or tile of the required shape. The pipe thus formed is delivered on to a table, H, which is supported by a rod, *j*, on which is cut a screw-thread; and this rod is raised or lowered by turning a wheel, I, so as to adjust the height of the table in accordance with the size of the pipe or tile being made. When the clay cylinder B is emptied the valve *g* is closed, and the valve *k* in the pipe *l* opened, which admits water from the pipe *i* into the cylinder F in front of the flange 6 of the piston E, to drive it back, as required, the valve *m* being first opened to allow the water behind the piston to pass into the pipe *n*, by which it is carried off as required. On the return stroke, the water in front of the flange 6 is exhausted through the pipe 7, figs. 1 and 2, which is commanded by the valve *o*. The pipe *n* leads from the cylinder F to the lower end of a cylinder, J, within which works a piston (seen dotted in fig. 1) to the upper end of the rod P of which is secured a platform, K, which slides on guide rods L, and is employed as an elevator to raise the clay from the floor below to that on which the machine is placed; the force of the water discharged from the cylinder F being sufficient for this purpose. *q* is a waste pipe, through which the water is discharged from the cylinder J, and the water from the several waste pipes may be conducted over the building or elsewhere, and used for a variety of purposes. If desired, a waste pipe may be connected with the pipe *n*, through which the water from the cylinder F may be allowed to escape, when it is not required to operate the elevator.

The employment of hydraulic power in machines of this description is exceedingly economical, as they can be operated at much less cost than when steam power is employed, and the services of a skilled engineer are not required.

### *Claim.*

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

A clay cylinder or receiver, B, in combination with a hydraulic cylinder operating a piston or plunger, D, for ejecting the clay from the receiver in the required form for a pipe or tile, substantially as described.

I also claim connecting the head or plunger D with the piston E of the hydraulic apparatus, by means of a screw, *e*, so that it may be moved toward and from the clay cylinder by hand, for the purpose specified.

CHARLES COLLIER.

Witnesses:

P. E. TESCHEMACHER,

N. W. STEARNS.