Hambleton & Herthel, Jr.,

Moulding Clay.

No. 87,043. Patented Feb. 16, 1869.

Fig. 1.

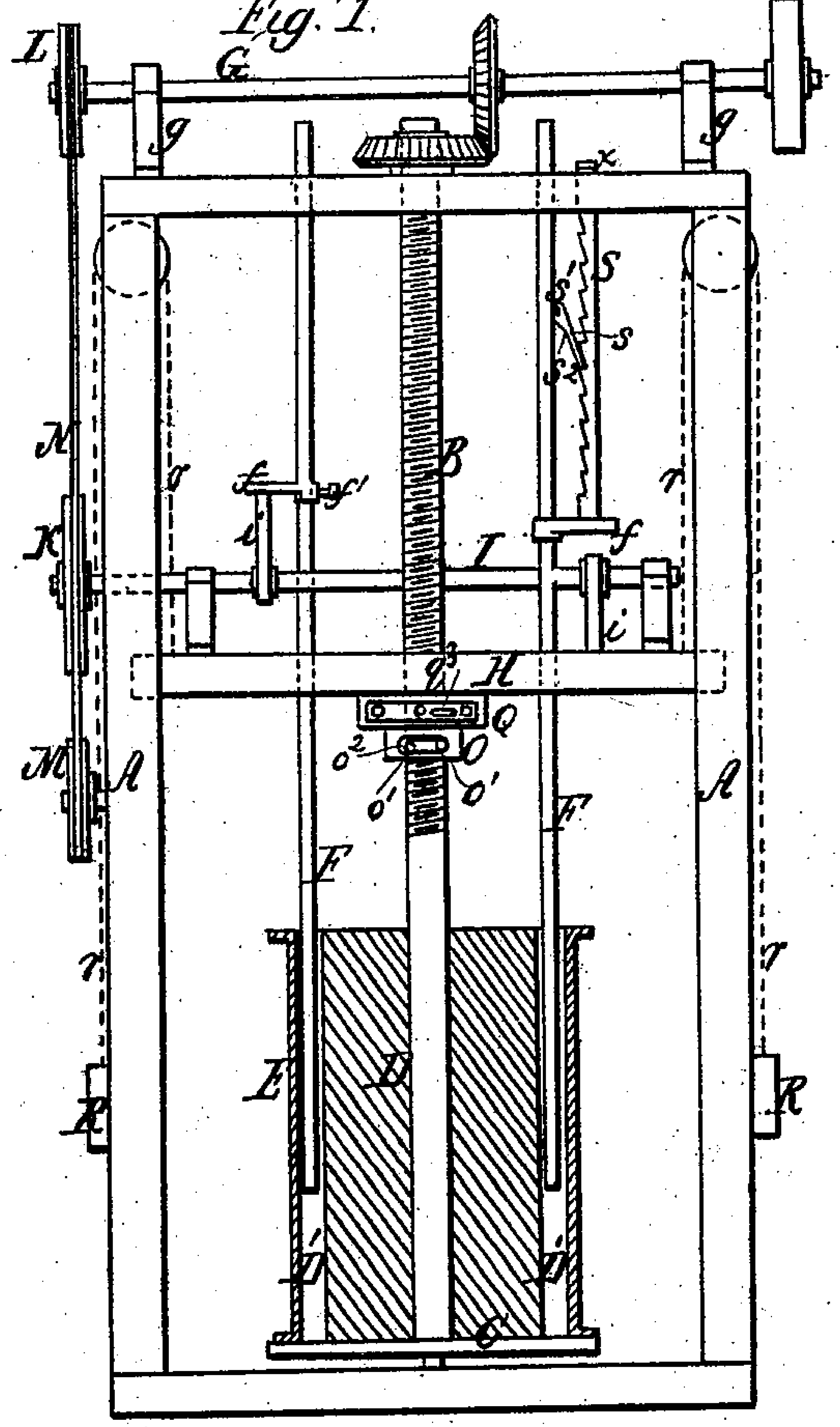


Fig. 2.

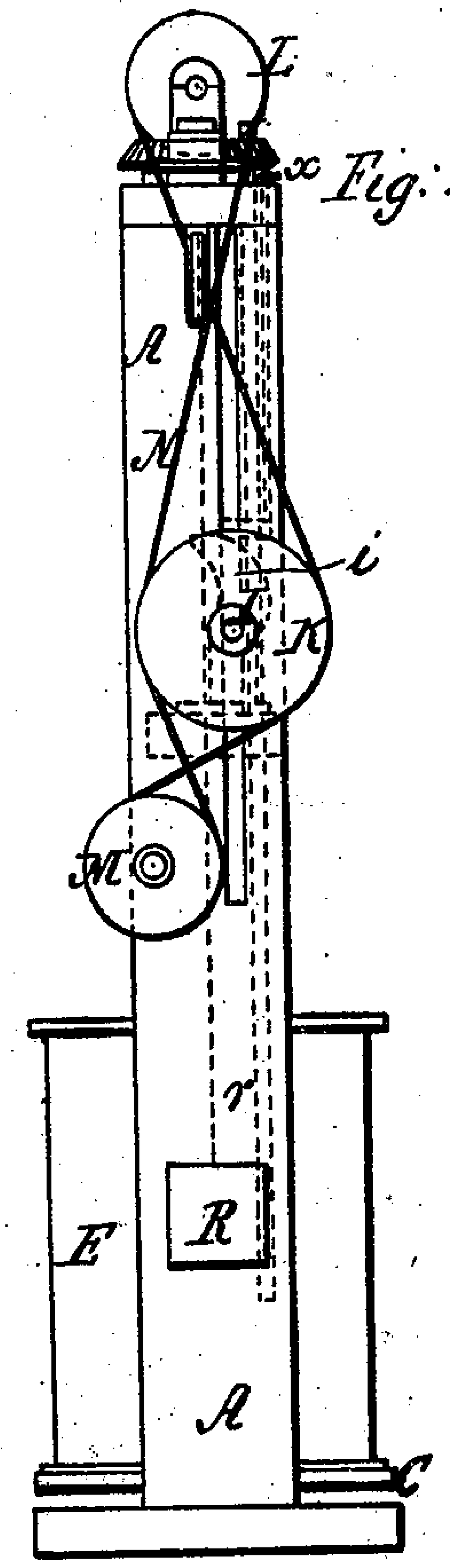


Fig. 3.

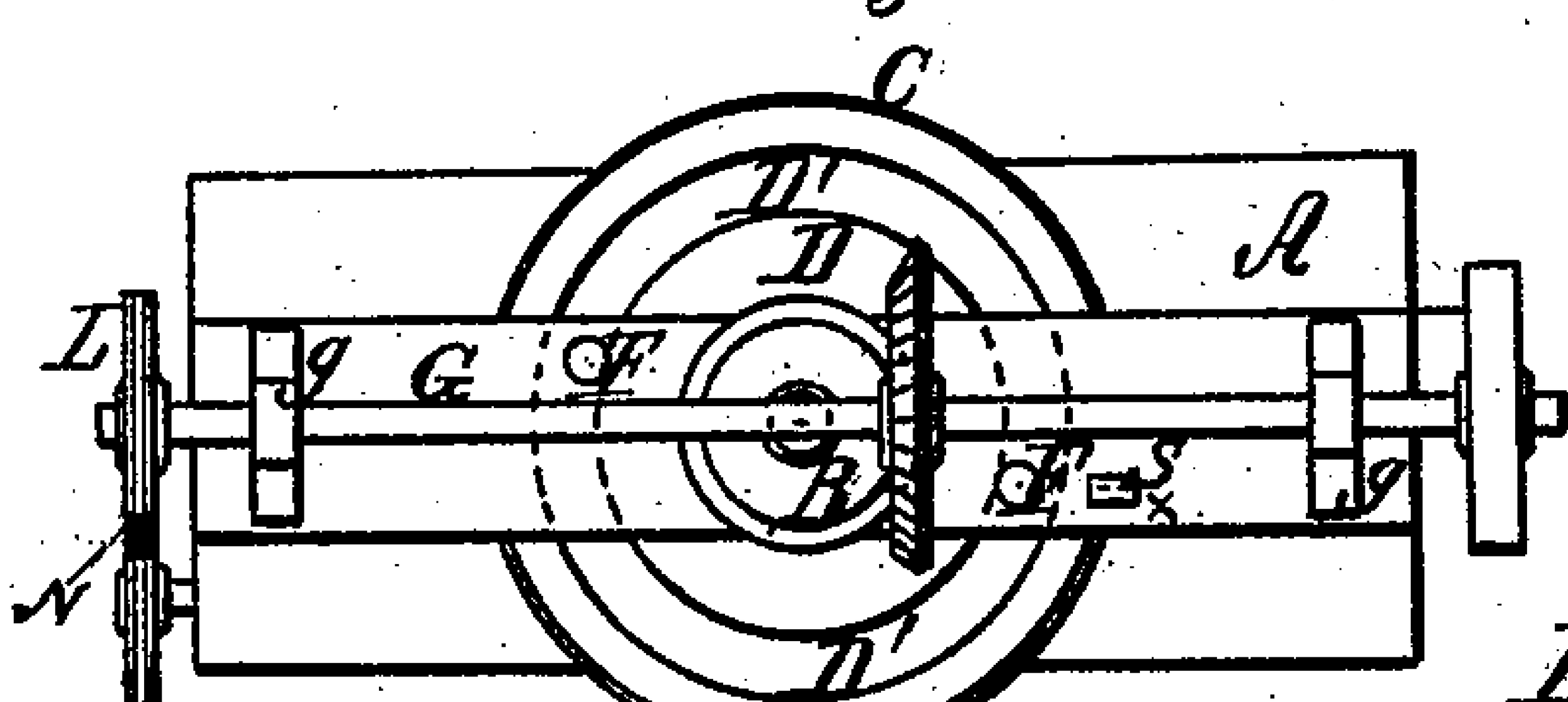


Fig. 4.

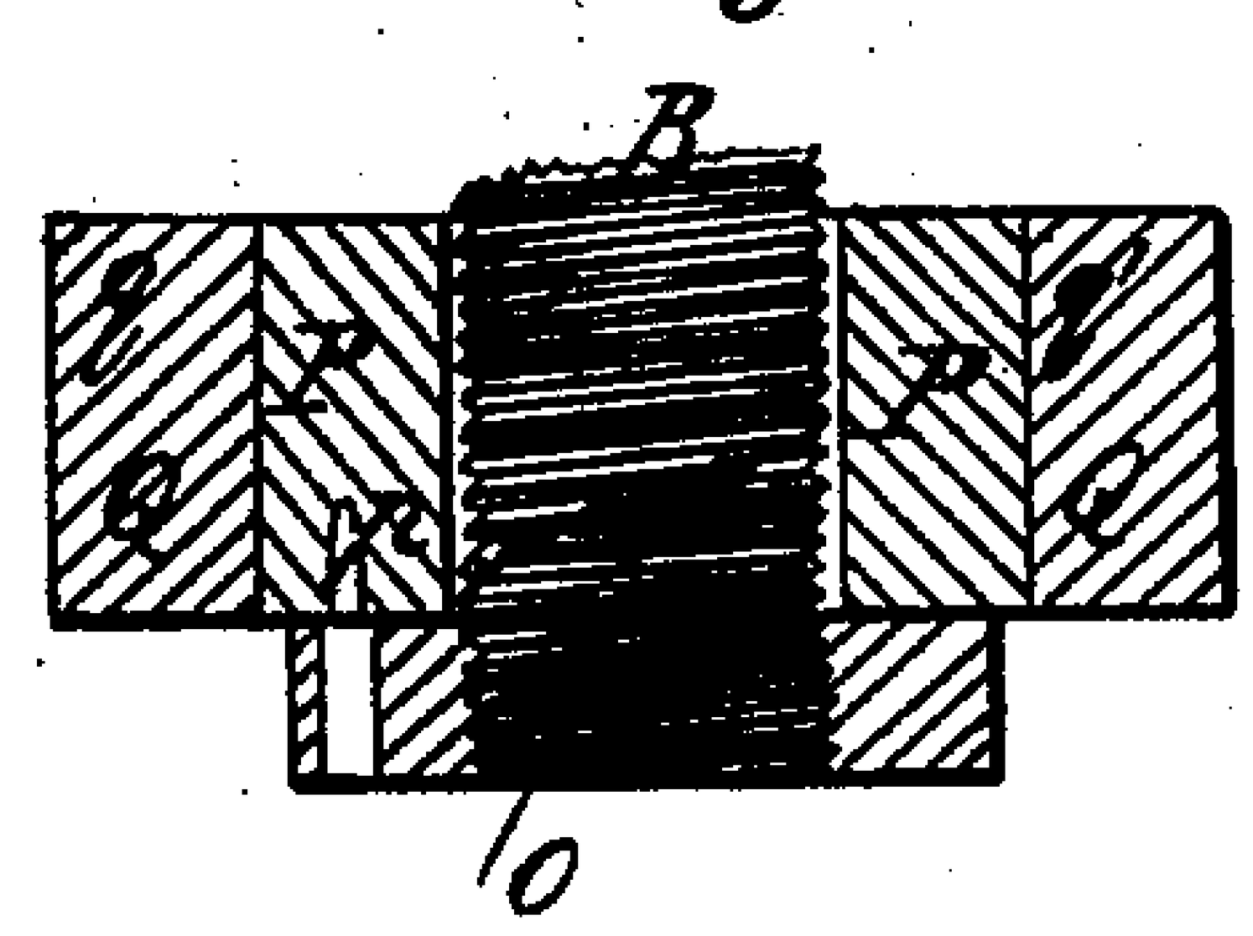
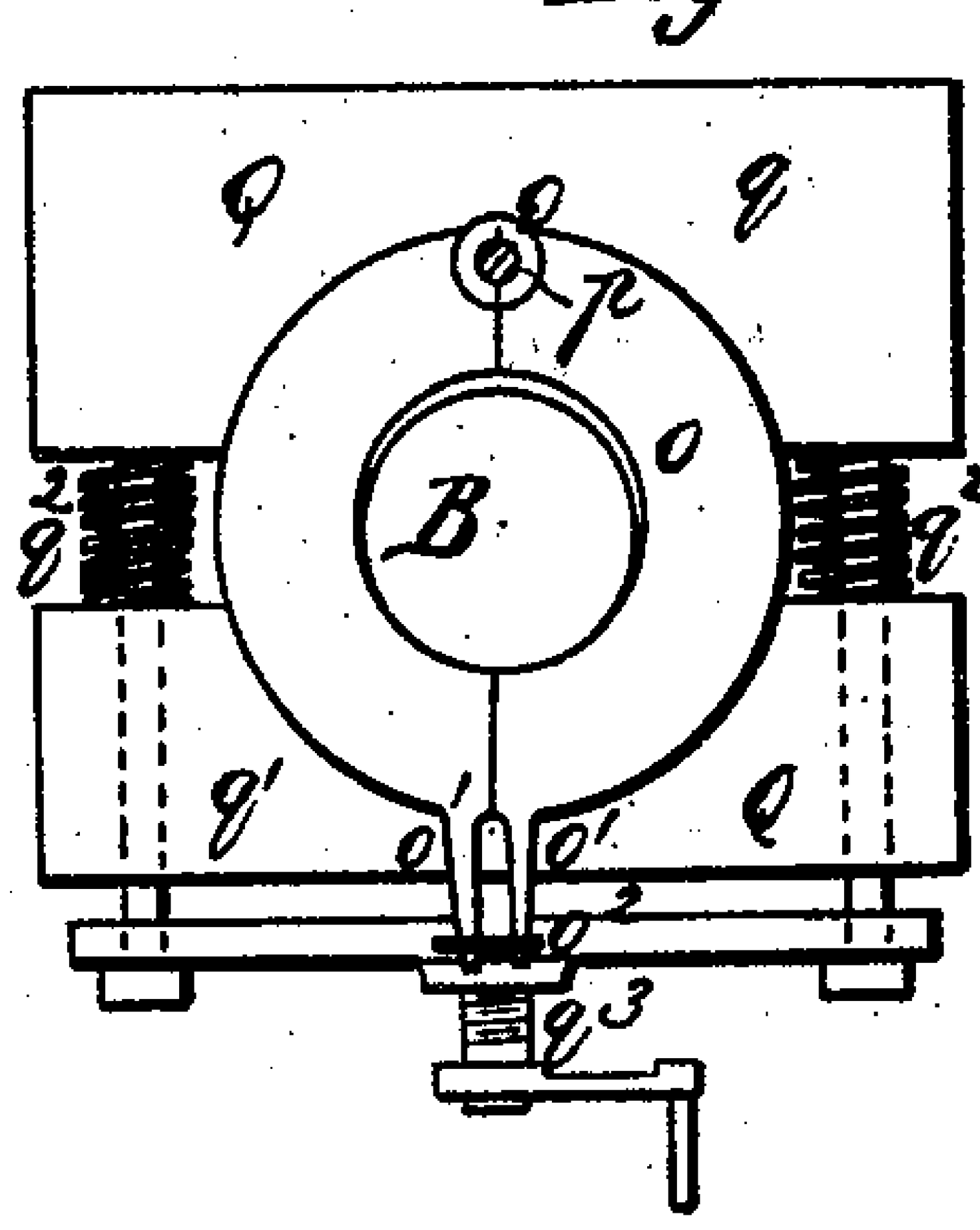


Fig. 5.



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SAMUEL HAMBLETON AND GEORGE P. HERTHEL, JR., OF ST. LOUIS, MISSOURI.

Letters Patent No. 87,043, *dated February* 16, 1869.

IMPROVED MACHINE FOR MOULDING CLAY.

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

To all whom it may concern:

Be it known that we, SAMUEL HAMBLETON and GEORGE P. HERTHEL, Jr., of St. Louis, in the county of St. Louis, and State of Missouri, have made certain new and useful Improvements in Machine for Moulding Clay Retorts, Pipes, and similar articles; and we do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The object of our said invention is to compress and stamp the clay, after it has been fed into a mould, into a compact, homogeneous mass, which shall not blister or crack by unequal expansion in the processes of drying and calcination, and the application of said invention is therefore especially for forming retorts, tiles, crucibles, pipes for drains, sewers, and similar articles which may be subject to great heat or pressure, or be otherwise used to contain gaseous or fluid bodies.

The nature of this invention is in such an arrangement of parts that nothing shall limit the stroke of the rammers but the clay in the mould, thus insuring that the clay shall receive the proper stamping-action; and said nature is also in the construction of certain devices hereinafter more fully described, so that the rammers may always be properly raised, and thus the force of the blow or ramming may be more readily adjusted in accordance with the nature of the clay, or the quantity thereof in the mould.

To enable those skilled herein to make and use our said improvements, we will now fully describe the same, referring to the accompanying

Figure 1 as a front elevation; to

Figure 2 as a side elevation; to

Figure 3 as a top plan; and to

Figures 4 and 5 as sectional elevation and sectional plan, respectively, of the screw-clutch device for raising the cam-devices and their connections, so as to follow the rise of the rammers as the clay is fed into the mould.

We support the operating-devices of our said machine upon a frame, A, which is usually of wood.

In said frame, in a central position thereof, we arrange the screw-shaft B.

At the lower end hereof, we connect to said shaft the turn-table C, said turn-table being supported by a proper bearing upon the base-block of the frame A, and being connected to said screw-shaft B, so as to be turned thereby.

Upon the turn-table C, we support the core D and mould E, the same forming the annular space D′, into which the clay or like substance is to be fed, to form the retort, pipe, or similar article.

The mould E will usually be arranged in halves, which are connected to each other by hinges, so that, upon the completion of retort or pipe, the said mould may be unclasped and removed; and in order that the retort or pipe itself may be removed, the screw-shaft B may be coupled or jointed immediately above the core D, so that when said coupling is disjointed, the core D, and the retort or pipe surrounding the same, may be lifted off, all of which may be done in any of the ways usually employed in similar machines.

We further arrange the stamps, or rammers F, in said frame A, so as to be guided in a motion, in a vertical (or very nearly vertical) direction, said rammers passing into the annular space D′, into which clay is fed.

There may be one, two, or more of said rammers F, which are to be raised by proper machinery, and permitted to drop freely upon the clay in the mould, as aforesaid. In order, however, that all points of the annular space D′ may be subjected to the ramming-action, we rotate the mould E and its connections by the screw-shaft B, arranging herefor the power-shaft G above the frame A, and properly supporting said shaft G by bearing-blocks *g* on said frame.

On said shaft G, we arrange a bevel-gear wheel, or worm, or similar power-transmission devices, connecting by bevel-gear wheel, or by worm-wheel, with the shaft B.

In order to operate the rammers F, we arrange a cross-bar, H, transversely across the frame A, guiding said bar H in said frame.

Upon said bar H we arrange the shaft I, supporting this shaft upon pillow-blocks on said bar H, in the ordinary manner.

At the outer end of said shaft I, we arrange the pulley K; and for the purpose of transmission of power to said shaft I, we also arrange the pulley L upon the end of the main driving-shaft G, and a pulley, M, secured to the side of the frame A.

Now, as the cross-bar H and shaft I are to have a vertical motion, we connect the belt N so as to enclose the running pulley K; then, as the length of the belt N is determined by the distance apart of the pulleys L and M, whatever may be the position of the shaft I and pulley K, the power will be exerted and motion transmitted.

On the shaft I are arranged the cams *i*. These may be single, (one for each rammer, as shown,) or there may be two arranged, with rammer between, to exert an even pressure to raise.

Said cams *i* operate upon the tappets *f*, and as these are secured to the rammers F by the set-screws *f′*, it will be seen that the rammers will thus be raised.

As the operator feeds clay to the mould E, the rammers will rise higher and higher, as in the nature of this invention, and as thus the relative position of the tappets *f* and cams *i* may be changed, we have arranged the set-screws *f′*, for securing the said tappets to the rammers F. By thus resetting the tappets *f*, said parts may be properly positioned.

In order, however, that the cams *i* may follow up as

nearly as possible the upward motion of the rammers and tappets, we have arranged to raise the cross-bar H and shaft I by the revolving screw-shaft B.

About said shaft B we arrange the clutch-nut O, said nut being formed of parts hinged together at *o*, the parts having handles o^1, for opening them, and a sliding clasp, o^2, for tightly holding the handles o^1 together.

Upon said clutch-nut is the washer P, connected with the nut O by the pin *p*.

Said washer is placed between the parts of a compresser, Q, consisting of the board *q*, firmly secured to the cross-bar H, and the moving board q^1.

The springs q^2 keep said boards apart, unless forced together by the compresser-screw q^3.

It will be seen, then, that if, by the compresser Q, the washer P and the clutch-nut O are prevented from turning with the shaft B, then the nut O will rise upon said shaft, and thus elevate the cross-bar H and shaft I, and thus the cams *i* will follow up the upward motion of the rammers and tappets. If, however, the cross-bar H should rise too fast, the cams *i* would be brought too close to the tappets *f*, and the rammers would not be raised high enough to give the proper ramming force. In this case we release the compresser Q, by return motion of the screw q^3, thus permitting the washer P to turn with the screw-nut O and the shaft B, and thereupon the said nut will not rise, and the cross-bar H thus remains stationary.

It is plain, also, that by regulating the pressure of the compresser Q upon the washer P, the speed of the cross-bar H may be somewhat regulated, and in this wise irregularities in the feed of clay, and consequent irregularities in the rise of the rammers F, may be followed up and accommodated.

The weight of the cross-bar H, and the parts supported thereon, may be counterbalanced by the weights R, acting by the ropes *r*.

When the cross-bar H has reached the upper end of its stroke, and a new filling of the mould is to be begun, the operator opens the clutch-nut O, and the cross-bar H and shaft I will then easily move down, whereupon the parts may be readjusted as before.

Lastly, in order that the said rammers F may be limited in downward stroke only by the clay beneath, and that the height of fall may be invariable, we have arranged upon the tappet *f* the rack S, said rack being guided in the frame A.

A detent, *x*, prevents said rack from dropping too low in the downward stroke.

Instead of securing the tappet *f* to the rammer F, as formerly indicated, we connect the tappet *f* and rack S to said rammer by the pawl *s*, secured to the rammer by the pivot s^1.

A spring, s^2, sets the said pawl out firmly to its engagement on said rack S.

It will then be seen that the cam *i* raises the rack S, and by the pawl *s* also the rammer F, and that the stroke of the rack and rammer is thus made invariable. When, now, the feed of clay to the mould increases the height of clay, the said rammer rises, the pawl *s* slipping up higher on the rack S, but on the upward stroke the rack always carries up the rammer the necessary height, equal to the lift of the cam, as heretofore required. By releasing the pawl *s*, the rammer is lowered to its lowest position, and the operation may be renewed.

In this form of our said device, the shaft I may be secured in the frame A, or rested upon a stationary cross-bar, H.

Having thus fully described our invention,

What we claim, is—

1. The shaft I and its cam *i*, operating the tappet *f*, arranged adjustably by set-screw *f''* on the rammer F, when combined with the cross-bar H, clutch-nut O, and screw-shaft B, substantially as set forth.

2. The nut O, washer P, and compresser Q, when combined with the cross-bar H and screw-shaft B, substantially as set forth.

3. The rack S and pawl *s*, in combination with the rammer F and the elevating-device, substantially as set forth.

In witness of said invention, we have hereunto set our hands, in the presence of witnesses.

SAMUEL HAMBLETON.
GEO. P. HERTHEL, JR.

Witnesses:
WM. W. HERTHEL,
ROBERT BURNS.