

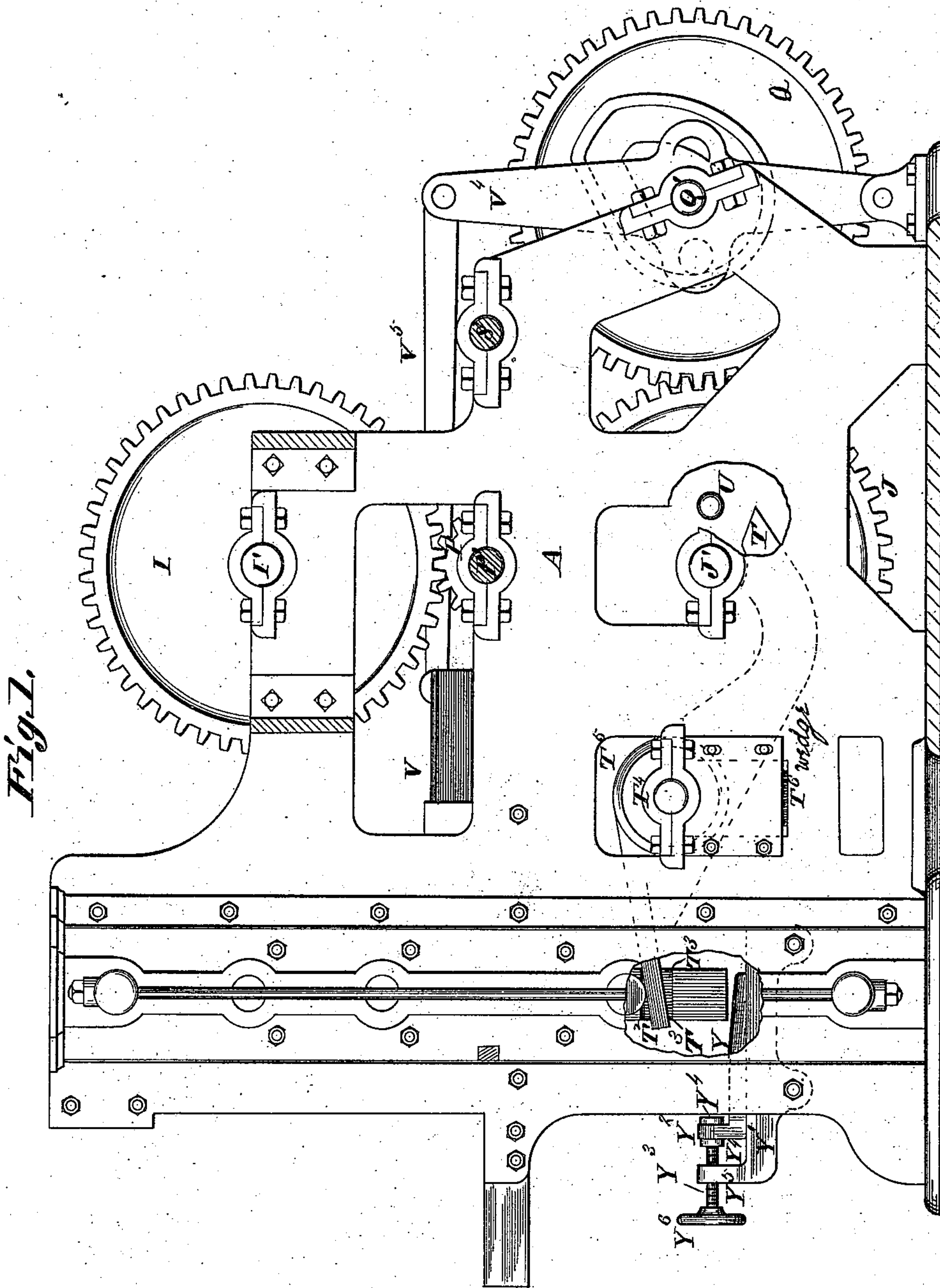
(No Model.)

4 Sheets—Sheet 1.

R. N. ROSS.
BRICK MACHINE.

No. 377,778.

Patented Feb. 14, 1888.



Witnesses

F. A. Soper King.

J. C. Knight.

Inventor

Robt N. Ross

By His Attorneys

Knights Bros

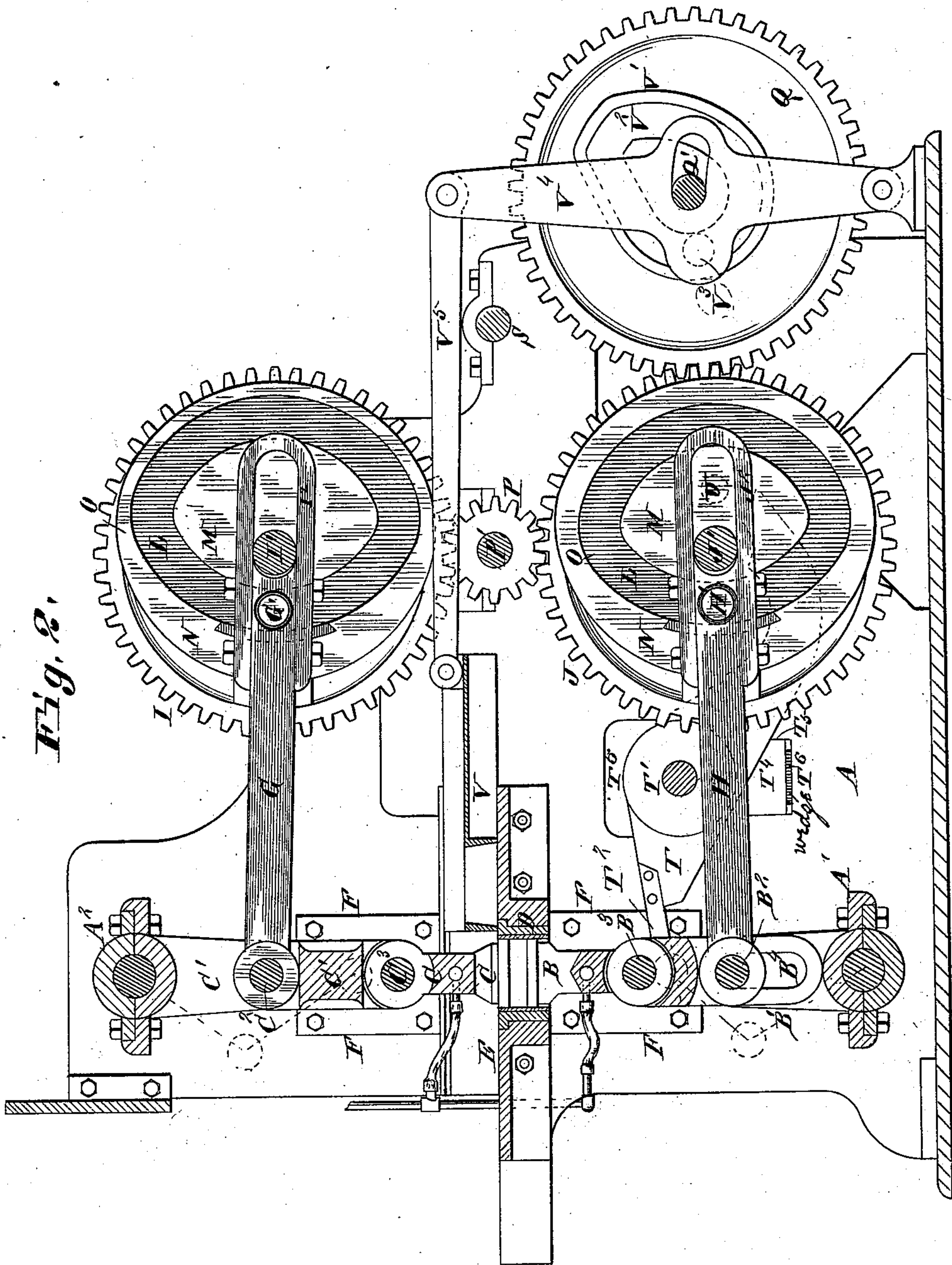
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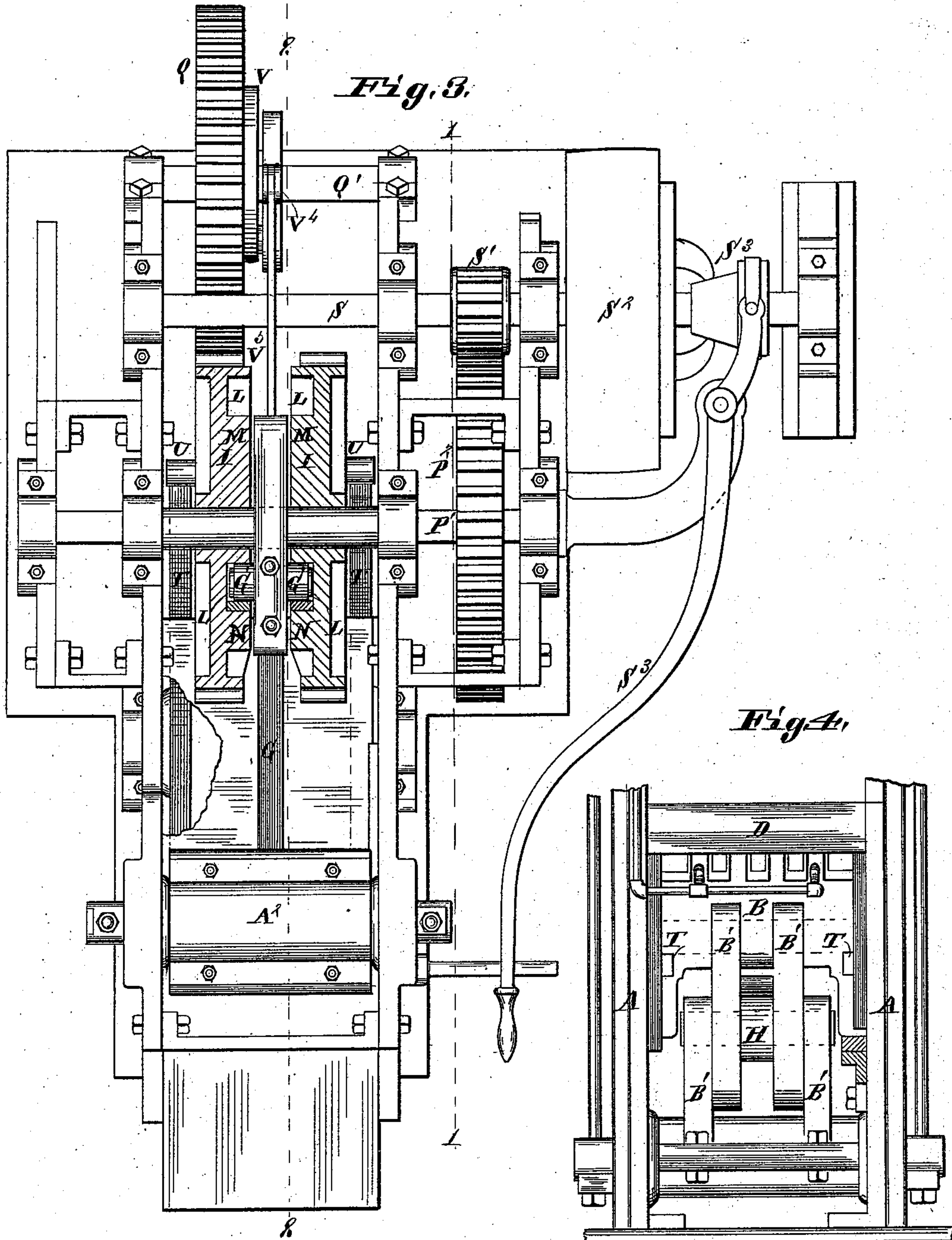
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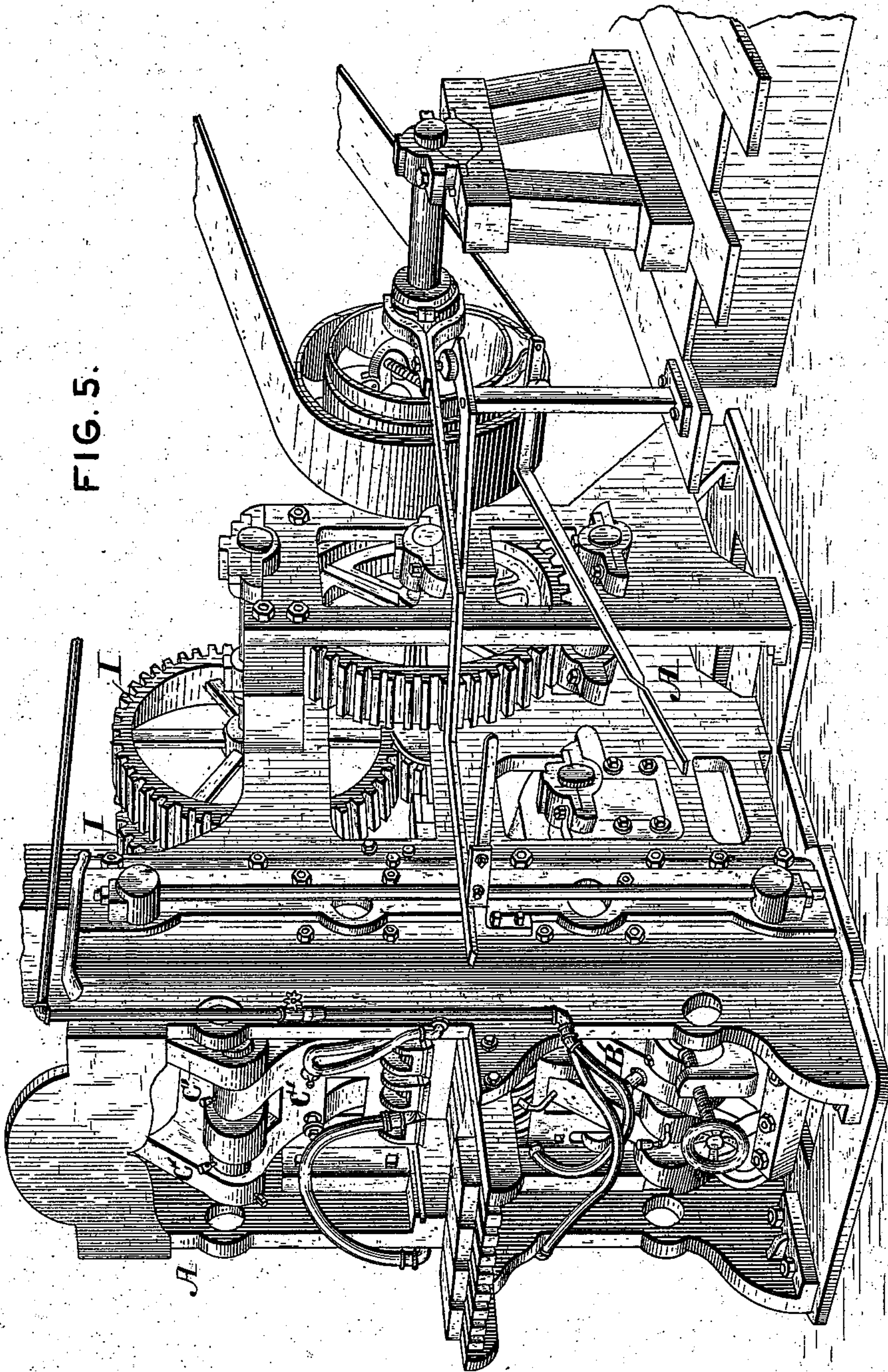
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ATTEST.

H. B. Knight
Edmund Steer
"

INVENTOR

Robert N. Ross
By Knight & Co
Attys

UNITED STATES PATENT OFFICE.

ROBERT N. ROSS, OF ST. LOUIS, MISSOURI.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,778, dated February 14, 1888.

Application filed June 28, 1886. Serial No. 206,408. (No model.)

To all whom it may concern:

Be it known that I, ROBERT N. ROSS, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Brick-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

10 Figure 1 is a vertical longitudinal section of my improved machine, taken on line 1 1, Fig. 3. Fig. 2 is a vertical longitudinal section taken on line 2 2, Fig. 3. Fig. 3 is a top view with the upper cam-wheels in section. Fig. 4
15 is a detail front elevation showing the lower part of the machine. Fig. 5 is a perspective view of the machine.

The object of my present invention is to overcome certain difficulties existing in brick-machines covered by various patents already issued to me—as, for instance, No. 293,596, dated February 12, 1884. The principal objection referred to is the crank (which was in the form of a wheel with a pin in one of the spokes) and
25 slotted pitman for operating the upper and lower plungers, respectively, the result of this slotted pitman and crank being that upon each operation of the plungers a jar or jerk would be given to the machine as the crank struck
30 the opposite ends of the slot in the pitman. This resulted in a disastrous wear and tear of the machinery; and, in addition to this objection, there existed another in the form of lost power, which was due to the bearing between
35 the crank and pitman being so far removed from the operating-shaft of the crank, the result being that an insufficient pressure was obtained to properly compress the clay in the mold.

40 As already stated, the object of my present invention is to overcome these difficulties; and to this end my present invention consists in features of novelty, hereinafter fully described, and pointed out in the claims.

45 Referring to the drawings, A represents the frame of the machine.

B represents the lower, and C the upper, plunger of the machine arranged to enter the mold D, located in a table, E. The lower
50 plunger is connected to the frame A, or other fixed object, at A', by means of toggle-bars B',

hinged or pivoted together at B², and the upper plunger is connected to the frame or other fixed object at A² by means of toggle-bars C', hinged or pivoted together at C². The upper
55 plunger is pivoted or hinged at C³ to the lower toggle-bar, C', and the lower plunger is hinged or pivoted at B³ to the upper toggle-bar, B'.

To compress the bricks, the toggle-bars move from the position shown in dotted lines, Fig. 60 2, to the position shown in full lines, same figure. The plungers are held and guided vertically during this movement of the toggle-bars by means of guides F, secured to the frame of the machine at each side of the re-
65 spective plungers.

G H represent upper and lower pitmen, connected, respectively, to the upper and lower toggle-bars at the pivot-points C² B², and they are preferably connected to the toggle-bars by
70 the pins that join the respective bars, as shown in Fig. 2. These pitmen act to force the toggle-bars from the position shown in dotted lines, Fig. 2, to the position shown in full lines, same figure, and vice versa, and in doing this the plungers are made to approach
75 and recede toward and from each other. The power is supplied to the pitmen to thus move them by means of cam-wheels I J, the cams acting directly upon the pins or projections G' H' on their respective pitmen, the pins or projections fitting in eccentric-grooves L of the wheels, and preferably being provided with friction-rollers. (See Fig. 3.) Inside the grooves
85 of the wheels are portions M, that force the pitmen and toggle-bars forward to elevate the plungers, and outside the grooves are portions N, that force or pull the pitmen and toggle-bars back to depress the plungers. There are preferably two of the wheels I, one acting
90 upon a projection, G', on each side of the pitman G, (see Fig. 3,) and in like manner there are preferably two of the wheels J, one acting upon a projection, H', on each side of the pitman H, the cams being on the adjacent faces
95 of the wheels and corresponding in form and shape. The outer ends of the pitmen are supported by the journals or axles I' J' of the wheels I J, to which they are connected by straps or yokes I² J², or to which they may be
100 connected by slots formed in the pitmen, if desired. These straps or yokes allow the throw

of the pitmen, at the same time holding them in their horizontal positions.

It will now be seen that when the machine is put in operation the portions N of the cam-wheels will, through means of the pitmen, force the plungers together to compress the material in the mold; and it will also be seen that as the plungers approach each other the point of bearing of the parts N of the wheels against the projections G' H' comes near or approaches the centers of the wheels—that is to say, when the plungers start to move toward each other, the parts N of the cams (indicated by the letter O) bear against the projections G' H', and as the plungers approach each other this point of bearing between the parts N of the wheels and the projections G' H' becomes nearer the centers of the wheels, so that the last part of the movement of the plungers is caused when the parts N of the wheels nearest the centers are bearing upon the projections G' H', as shown in Fig. 2. Thus it will be seen that as the demand for power increases it increases, in fact, because when the greatest power is needed the projections G' H' come close to the centers of the wheels.

The parts M of the wheels bearing against the projections G' H' cause the toggle-bars to be forced outward into the position shown in dotted lines, Fig. 2, and thus the plungers are caused to recede from each other. At the time that the parts N of the wheels cease to operate upon the projections G' H' the parts M commence to operate, causing the movement of the pitmen in the other direction, and as there is no lost motion, because of a contact always between the projections G' H' and the respective parts N M of the wheels, any jarring or jerking of the parts is effectually overcome and avoided.

The cam-wheels are preferably driven through means of cogs formed thereon, which mesh into pinions P, located on and secured to a shaft, P', which is also provided with a cog-wheel, P², meshing into a pinion, S', on the main driving-shaft S, provided with a driving-pulley, S², and clutch mechanism S³, such as is shown, described, and claimed in Patent No. 298,708 issued to my assignee May 13, 1884. There are preferably two of the pinions P—one for each pair of the wheels I J—one of them being shown in Fig. 2 and the other in Fig. 1. The cam-wheels could, however, be operated by a different system or train of gearing.

In order that the lower plunger may be made to follow the upper a distance after each pressure upon the bricks, for the purpose of ejecting the bricks from the mold, I extend the lower end of the upper toggle-bar, B', beneath the pivot-pin B², as shown in Fig. 2, and make a slot, B⁴, therein, so that the lower plunger may be raised without interfering with the operation of the toggle-bar. It is thus raised by levers T, hinged to the frame of the machine at T', the ends T² of which extend beneath the lower plunger, entering notches T³ of the lower

plunger, (see Fig. 1,) and the outer ends of the levers extend beneath the axle or bearing J' of the lower cam-wheel. After the bricks are pressed projections U on the lower cam-wheels, J, come against the outer ends of the levers T, and by depressing them cause the upward movement of the lower plunger to eject the bricks, and when the projections U leave the inner ends of the levers the weight of the plunger causes it to recede to its lower position, the slot B⁴ working on the connecting-pin B².

The levers T are arranged upon a shaft, T', journaled in boxes T⁴, fitting in openings T⁵ in the frame A of the machine. These boxes are capable of being moved vertically, as shown in Fig. 1, and this is done by means of a wedge, T⁶, driven between each and the bottom of the opening T⁵, in which the box fits and moves. The object of thus making the box adjustable, and consequently the levers T, is to regulate the vertical movement of the lower plunger effected by the levers in ejecting the bricks. Thus supposing the plunger is not raised quite far enough to eject the bricks from the mold, it is only necessary to drive the wedges T⁶ inward a little, which will lift the levers, so that when they are operated upon by the pins U their outer ends will lift the plunger a greater distance than before.

V represents the charger. It is operated by a cam, V', on a cog-wheel, Q, on the shaft Q', and meshing into one of the wheels J. The cam has a groove, V², in which fits a pin, V³, on an arm or lever, V⁴, connected by a pitman or link, V⁵, to the charger. The cam is of such a shape that it will cause the forward movement of the charger at the proper time to shove the bricks from the mold, and recharge the mold with clay and then recede to its normal position.

To regulate the amount of clay that enters the mold, I limit the downward movement of the lower plunger by means of a sliding wedge, Y, located beneath the lower plunger and supported by a fixed plate, Y', bolted to the frame of the machine. The wedge Y has an up-turned outer end, Y², with which is connected a set-screw, Y³, by means of collars or projections Y⁴, the screw Y³ passing through an up-turned projection, Y⁵, on the plate Y', and is provided with a hand-wheel or similar turning device, Y⁶, on its outer end. Thus it will be seen that by turning the set-screw to move the wedge Y in or out the fall of the lower plunger will be regulated, and consequently the amount of clay entering the mold, the lower plunger forming the bottom of the mold.

I have shown the machine constructed so that both the upper and lower plungers are operated by means of my improved device. It is evident, however, that either one of these could be operated by my improved device, and the other either be arranged stationary or be made to be operated by different means. I have also shown and described my machine for use in pressing clay in the manufacture of bricks; but it might be used, with slight modi-

fications, for pressing other material—as, for instance, tobacco in the manufacture of plug-tobacco.

I claim as my invention—

5 1. In a brick-machine, the combination, with the plunger, of toggle-bars for operating it, a pitman connected to the toggle-bars, and a cam for imparting reciprocating motion to said pitman, said cam and the other parts being so
10 disposed that the point of contact between the pitman and cam approaches the center of motion of the cam as the toggle-bars move into line, substantially as set forth.

2. In a brick-machine, the combination, with
15 the plunger and toggle-bars for operating it, of a pitman connected directly to said toggle-bars and having a lateral projection therefrom, and a wheel having a cam-groove in which said projection fits, the cam-groove and
20 the toggle-bars being so disposed that the projection will be moved toward the center of motion of the wheel as the toggle-bars move into line and pressure increases, substantially as set forth.

25 3. In combination with the plunger of a brick or similar machine, the toggle-bars connecting the plunger to a fixed object, pitman connected to the toggle-bars, a projection on the pitman, and cam-wheel for operating the
30 pitman, the bearing of the cam upon the projection of the pitman approaching the center of the wheel as the plunger enters the mold, as set forth.

4. In combination with the plunger of a
35 brick or similar machine, the toggle-bars connecting the plunger to a fixed object, pitman connected to the toggle-bars, projections on the pitman, and cam-wheels arranged side by side and bearing upon the projections on the
40 opposite sides of the pitman, substantially as and for the purpose set forth.

5. In combination with the upper and lower plungers of a brick-machine, toggle-bars connecting the plungers to the frame of the machine, pitmen connected to the toggle-bars,
45 projections on the pitmen, twin upper and lower cam-wheels provided with grooves to receive the projections, and which act to operate the pitmen and toggle-bars, substantially
50 as shown and described.

6. In combination with the upper and lower plungers of a brick or similar machine, toggle-bars connecting the plungers to the frame of the machine, pitmen connected to the toggle-

bars, upper and lower twin cam-wheels pro- 55
vided with grooves to receive the projections on the pitmen, and which act to operate the pitmen and toggle-bars, and straps connecting the pitmen to the axles or journals between each upper and lower pair of wheels, substan- 60
tially as shown and described, for the purpose set forth.

7. In combination with the plungers of a brick or similar machine, toggle-bars connect- 65
ing the plungers to the frame of the machine, one of the toggle-bars being provided with a slot, B⁴, pitmen connected to the toggle-bars, cam-wheels for operating the pitmen, adjust-
able levers pivoted to the frame of the machine and engaging beneath the lower plun- 70
ger, and pins on the lower cam-wheels for coming against the levers and lifting the lower plunger to eject the bricks from the mold, substantially as shown and described, for the purpose set forth. 75

8. In combination with the plungers of a brick or similar machine, toggle-bars connect-
ing the plungers to the frame of the machine, pitmen connected to the toggle-bars, upper
and lower combined cog and cam wheels for 80
operating the pitmen and toggle-bars, combined cog and cam wheel meshing into one of the pitman-wheels, charger, and arm or lever connected to the charger and operated by the charger cam-wheel, substantially as and for 85
the purpose set forth.

9. The combination, with the plungers and means for operating them, of the pivoted lever T, engaging at one end with the lower plunger and engaged at the other by a moving part for 90
rocking it on its fulcrum, and a vertically-adjustable block to which said lever is fulcrumed, substantially as set forth.

10. In combination with the plunger of a brick or similar machine, toggle-bars connect- 95
ing the plungers to the frame of the machine, one of the toggle-bars being provided with a slot, B⁴, mechanism for operating the toggle-bars, levers secured to a shaft made vertically adjustable by sliding boxes and wedges and 100
engaging beneath the lower plunger, and mechanism for operating the levers to lift the plunger and eject the bricks from the mold, substantially as set forth.

ROBT. N. ROSS.

In presence of—

MOSES N. SALE,
GEO. H. KNIGHT.