

(No Model.)

3 Sheets--Sheet 1.

M. E. SMITH & A. M. GLAZE.

Rotary Brick Machine.

No. 232,769.

Patented Sept. 28, 1880.

Fig. 1.

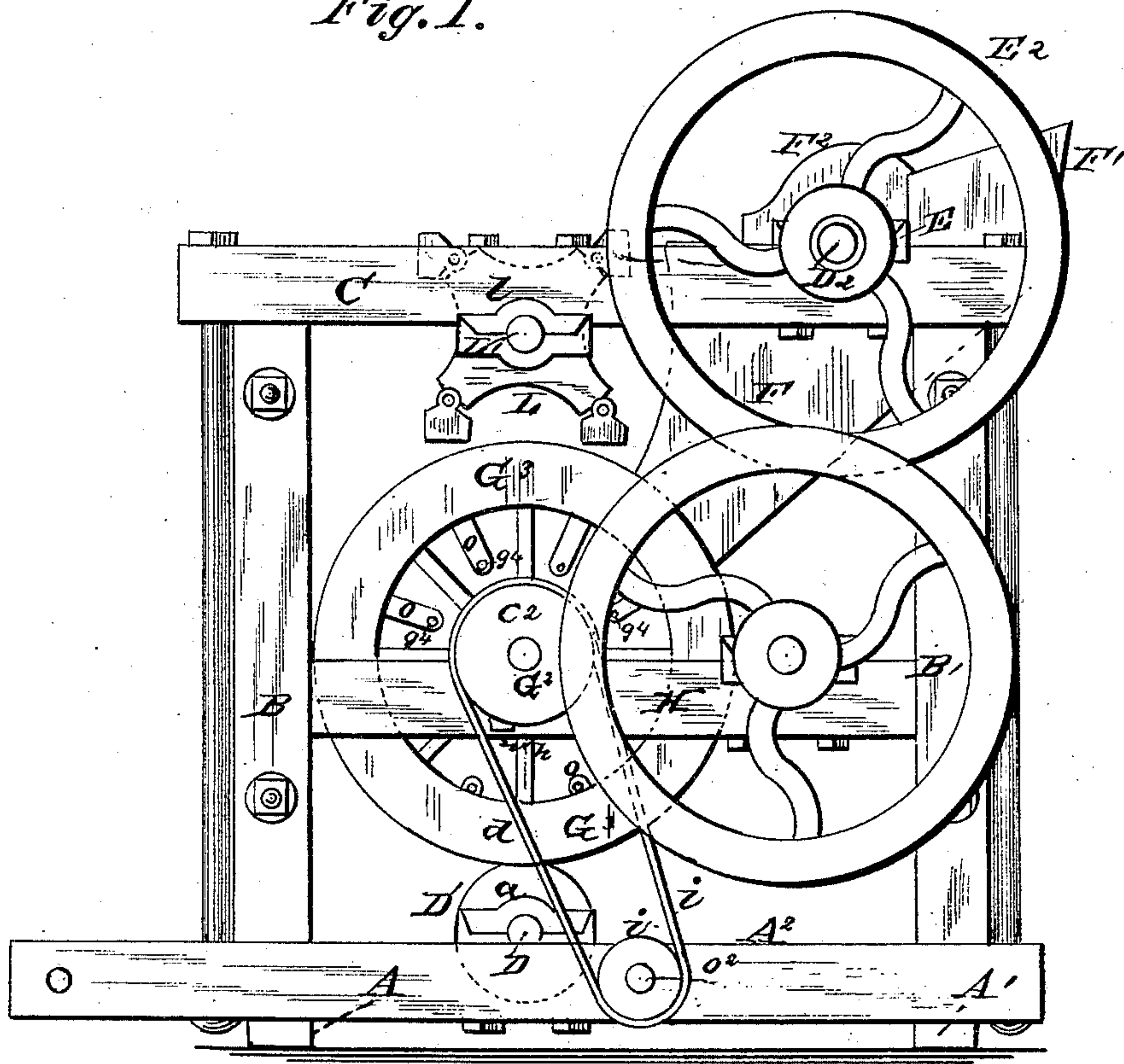
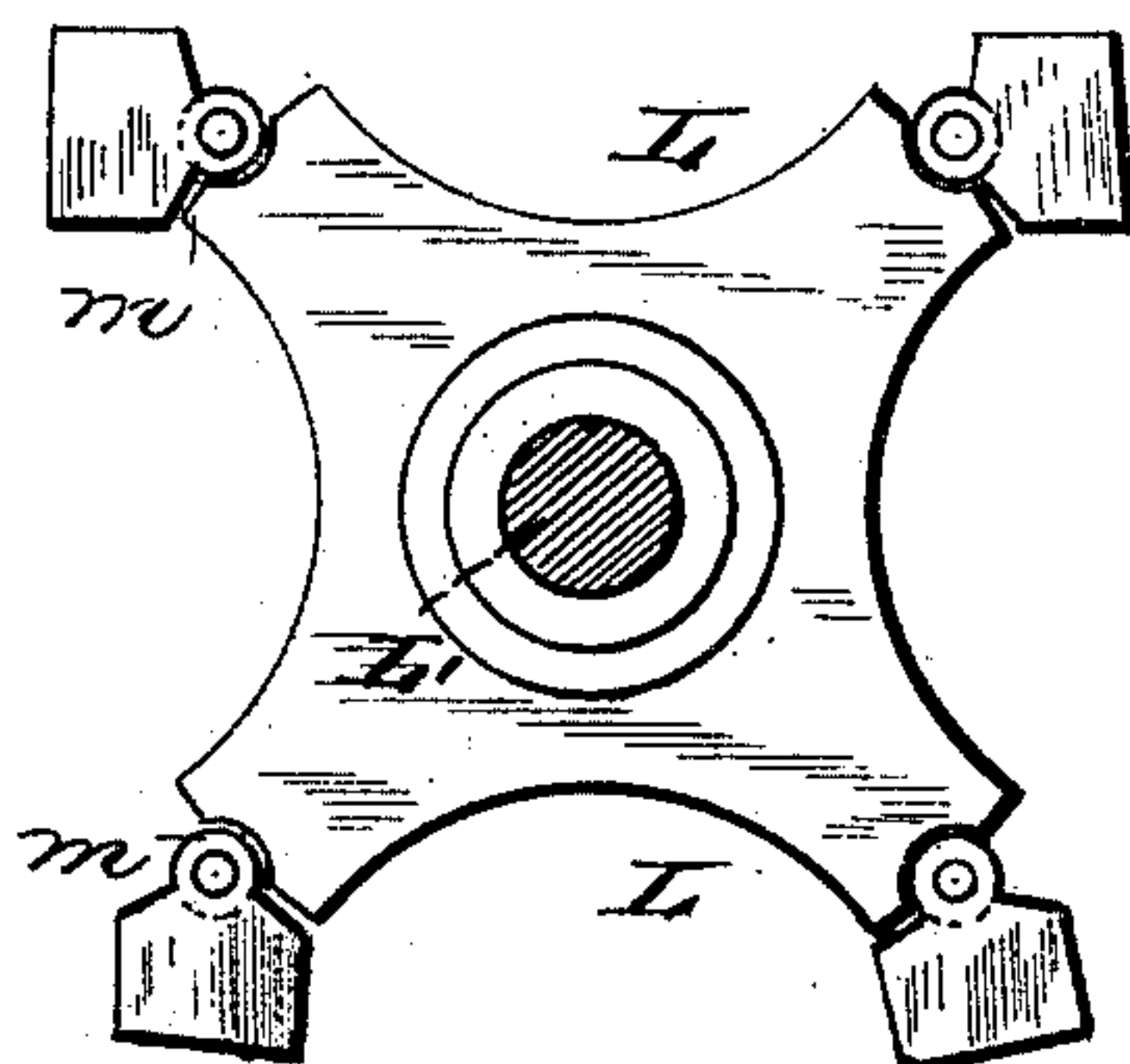


Fig. 2.



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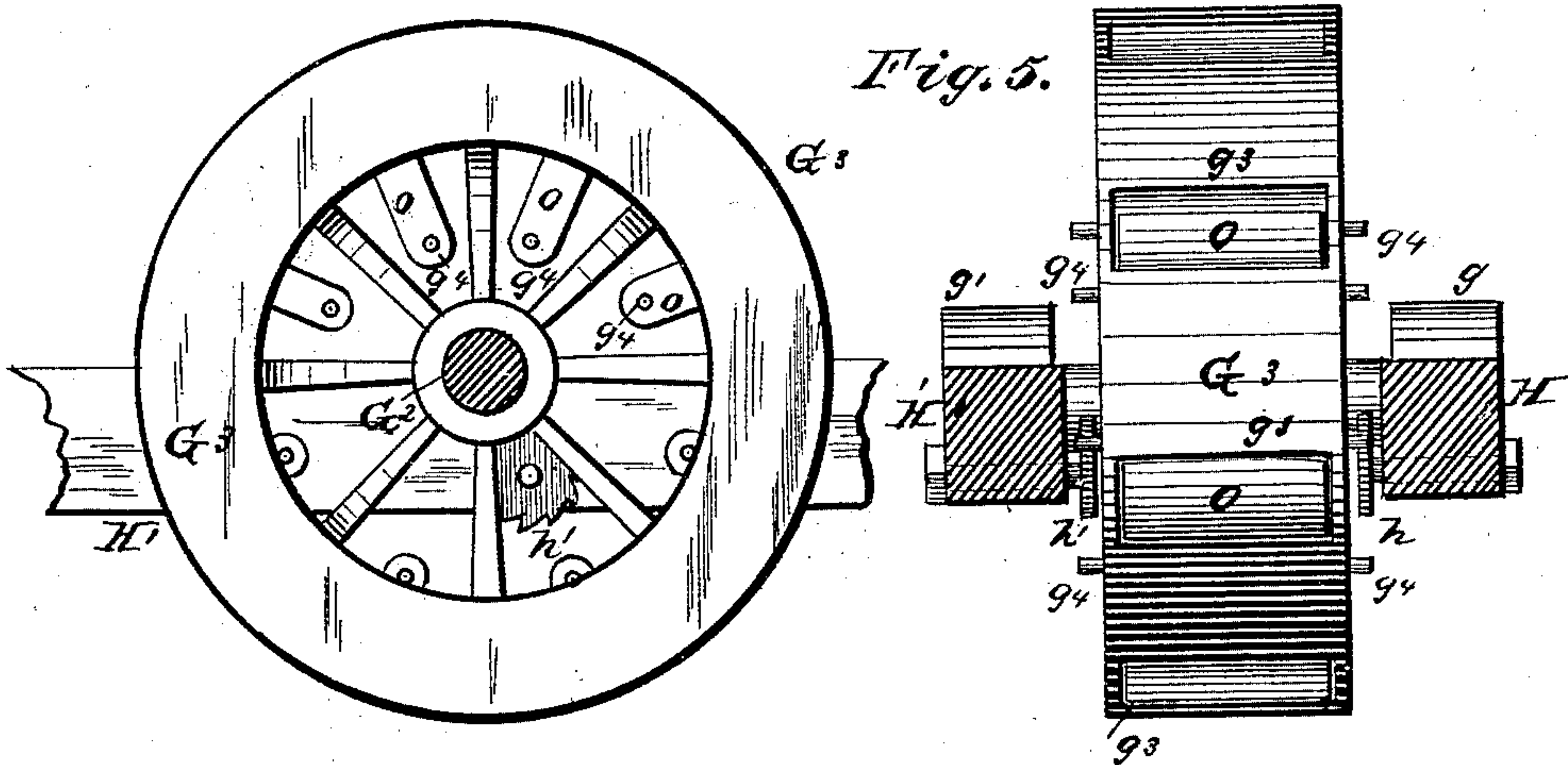
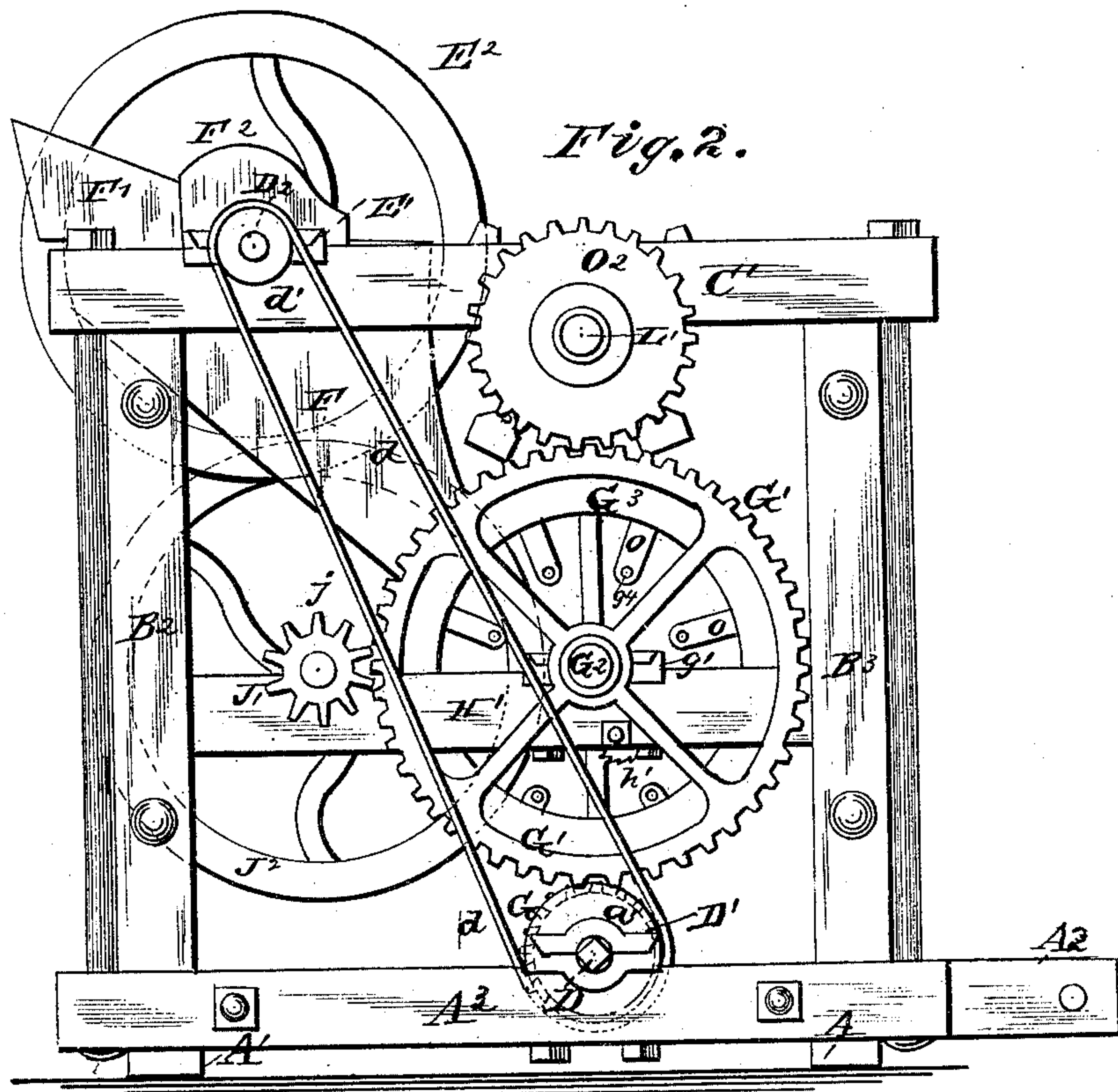
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Patented Sept. 28, 1880.



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3 Sheets--Sheet 3.

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UNITED STATES PATENT OFFICE.

MICHAEL E. SMITH AND ALEXANDER M. GLAZE, OF TRAER, IOWA; SAID
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ROTARY BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 232,769, dated September 28, 1880.

Application filed April 5, 1880. (No model.)

To all whom it may concern:

Be it known that we, MICHAEL E. SMITH and ALEXANDER M. GLAZE, of Traer, in the county of Tama and State of Iowa, have invented certain new and useful Improvements in Rotary Brick-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to an improvement in rotary brick-machines, the object being to provide a machine of this character in which the molds are located on the periphery of a revolving wheel and receive their charge of clay from a hopper or pug-mill above the same, and in which the clay, after it has been passed into the molds, is compressed by the application of force communicated thereto by a press-wheel situated directly above the mold-wheel, said press-wheel being provided with outwardly-projecting arms furnished with laterally-hinged blocks or compressors corresponding and registering with the depressions in the periphery of the mold-wheel, which latter are provided with movable bottoms or plungers adapted to be forced outwardly, thereby discharging the green bricks upon an endless apron or track by two wheels placed on each side of, beneath, and a little to the right of, the metallic packing-boxes in which the mold-wheel shaft runs.

In the accompanying drawings, Figure 1 is a front view in side elevation. Fig. 2 is a rear view in elevation. Fig. 3 is a plan view of our improvement. Fig. 4 is a view in longitudinal section. Fig. 5 is a detached view of the mold-wheel. Fig. 6 is a detached view of the press-wheel with laterally-hinged arms attached.

A A' represent the main sills supporting the frame-work of the machine. A² is a supplemental supporting-frame, having a supplemental sill, A³. This supplemental frame is designed to provide suitable bearings for the main shaft, through which actuation is imparted to the machine from the motor. B B' B² B³ are the

four uprights attached to the sills A A', and further held in rigid position by the end cross-bars, b b' b² b³, placed between them, and respectively near their upper and lower ends. C C' are the longitudinal frame-pieces placed upon and secured to the uprights. The whole frame is further strengthened and given rigidity by a series of vertical and horizontal tie-rods securely bolted to the frame-work.

To the sills A A² are secured the journal-bearings a a', in which are journaled the opposite ends of the main shaft D, on which is secured a pulley, D', over which is placed a belt, d, encircling a pulley, d', secured to the shaft D², having the stirrer of the hopper or pug-mill connected therewith.

Shaft D² is journaled in the journal-bearings E E', secured to the longitudinal frame-pieces C C', and projects through and beyond the journal-bearings to admit of the attachment of the pulley d' and the fly or balance wheel E², and is prevented from longitudinal movement in its bearings by the annular rings or flanges e e'.

To the shaft D² are secured three or more sets of stirrers, e², preferably detachable that they may be the more easily removed when worn, which act with arms e³, attached in rigid adjustment in a concave in the pug-mill or hopper F to break up and knead the clay before it passes into the brick-molds in the periphery of the mold-wheel.

The hopper F is provided with a clay-receiving receptacle, F', with outwardly-flaring sides, and adapted to convey the clay thrown there- in directly onto the stirrers e², by which it will be thrown over onto and broken up by the rigid arms e³, located in the concave d⁴ of the hopper. The hopper is further provided with a cover or protector, F², of suitable shape, and adapted, by recesses in its side walls, to be set down upon the stirrer-shaft D², the recesses fitting over the shaft. This cover prevents the flying clay and clay-dust, when the stirrer is rapidly revolving, from clogging up and obstructing the free operation of the mold and press wheels. The walls of the hopper converge as they approach the mold-wheel, forming a trough of the same width as the wheel, the front wall, e, thereof being adapted to scrape

the superfluous clay from the wheel, thereby leaving the brick-mold or depression therein just even full as it passes on for the compressing action of the press-wheel.

5 To the rear end of the shaft D^2 is attached a balance or fly wheel, E^2 , which serves to give increased overcoming power to the machine, and also renders it steady and even in its operation.

10 To the main shaft D is secured a cog-wheel, G , which meshes with the large gear-wheel, G' , which latter is attached to the mold-wheel shaft G^2 , journaled in the journal-bearings g g' , respectively, secured to the upper face of the
15 longitudinal cross-pieces H H' . On this mold-wheel shaft G^2 the large mold-wheel G^3 revolves from left to right. The periphery of this wheel is provided with any desired number of brick-molds or depressions, g^3 , the dimensions whereof are exactly the same as those
20 of the brick which it is desired to manufacture. These brick-molds or depressions are provided with false bottoms or plungers o , which have free movement therein, and are furnished with horizontal releasing-arms g^4 ,
25 which arms engage with the small wheels or cams h h' , pivoted or secured in equivalent manner to the inside faces of the longitudinal cross-pieces H H' , their office being to force
30 the false bottoms or plunger of the brick-molds out even with the periphery of the wheel, thus discharging the molded brick.

Midway of that portion of the sills A A' which comes between the uprights is journaled
35 a drum or cylinder, I , which is connected with another similar drum or cylinder, I^2 , journaled between the projecting ends of the main sills A A' , by an endless track or apron, o' , encircling both said cylinders or drums, I I^2 . This apron
40 o' is actuated, in rotation from left to right, by a belt, i , passed over a pulley, i' , attached to the shaft o^2 , on which the drum I revolves, and over a pulley, c^2 , secured to the rear end of the mold-wheel shaft G^2 .

45 In journal-bearings J J' , secured to the longitudinal cross-pieces H H' , is journaled the fly or balance wheel shaft, to one end of which is attached a cog-wheel, j , meshing with the large gear-wheel G' , and to the other and rear end
50 the balance-wheel J^2 , which latter is designed to give increased power and evenness of motion to the machine.

Press-wheel L is mounted on the press-wheel shaft L' , said shaft being journaled in the
55 journal-bearings l l' , respectively, suspended from the lower face of the longitudinal frame-pieces C C' . The press-wheel here shown is formed with four outwardly-projecting arms, but more may be made use of if desired. To
60 each of these arms is attached a compressor or block of substantially the same measurement in every dimension, and a counterpart of the brick-molds or depressions in the periphery of the mold-wheel, being just enough
65 smaller to be admitted therein with close connection. The blocks or compressors are se-

cured to the arms of the wheel by broad hinge attachment, which provides a very simple and firm bearing. In order to give the block
greater freedom of motion the ends of the 70 outwardly-projecting arms of the press-wheel are beveled, as at m' in the drawings.

The press-wheel L is actuated in motion by a cog-wheel, O^2 , attached to that end of the press-wheel shaft L' which projects through 75 the suspended journal-bearing l , said wheel meshing with the large gear-wheel G' .

The frame-work, consisting of the sills, end pieces, longitudinal frame-pieces, uprights, &c., of my brick-machine is preferably of 80 wood, strengthened and made rigid, and therefore capable of withstanding great strain by the use of vertical and longitudinal tie-rods securely bolted to the frame.

The hopper or pug-mill may be built of 85 sheet or cast iron, or iron in combination with wood, and the mold-wheel, press-wheel, and cogs may be either of cast metal or steel, that metal offering the greatest resistance to the wearing action of clay being most desirable. 90

Instead of forming the molds as described and shown, we may insert suitably-arranged steel boxes in the periphery of the mold-wheel. A cast-iron wheel might be thus provided with steel molds or boxes, and thereby be made 95 equally as efficient and lasting as a wheel of solid steel.

Having described our invention in detail, we will now proceed to describe the operation thereof. 100

The dry clay is first thrown into the hopper or pug-mill, where it is thoroughly kneaded and freed of lumps by the outwardly-flaring arms on the revolving stirrer-shaft, acting in connection with the arms in rigid adjustment 105 situated in a concave formed therefor in the hopper, the clay so manipulated descending by its own gravity, and crowded down by the ever inpouring supply at the mouth of the pug-mill, falls into the brick-mold or depression presented at that moment by the mold-wheel, and is pressed therein with a force equal to its own gravity and the weight of the mass above. As the mold-wheel revolves all 110 superfluous clay on the wheel will be removed 115 and the mold left even full with clay by the front piece or scraper of the pug-mill. As the press-wheel revolves the compressors or blocks will of their own gravity, as they pass a vertical position, fall over from the right to 120 the left, resting for a short time on the beveled edge of the projecting arm of the press-wheel, to which the said compressor-block is hinged, and at length hang perpendicularly down. The revolutions of the mold and press wheels 125 are so timed that as soon as a mold or depression in the periphery of the mold-wheel is filled even full with clay and passed from under the scraper it is immediately presented to the compressing action of one of the hinged 130 blocks or compressors on the press-wheel G . These blocks have broad hinged bearing on

the projecting arms of the press-wheel, and are direct and uniform in their compressing action, the force being equally distributed over the whole surface of clay in the mold.

5 The bricks so produced will be uniform in texture and density. The clay in the mold having thus been subjected to the action of the compressing-block, the wheel meanwhile passing through but a small arc of a circle,

10 the block will, by reason of the free swinging movement which it has on its pivoted bearing, be lifted from the mold without disturbing the molded brick. The mold-wheel revolving from left to right will carry the molded

15 bricks around until the horizontal releasing-arms g^4 , passing through the false bottom or plungers of the brick-molds, come in contact with the peripheries of the two small wheels or cams, which are pivoted or secured in equivalent manner to the inside faces of the lower

20 longitudinal cross-pieces and a little to the right of the journal-boxes in which the mold-wheel shaft is journaled. These wheels or cams, acting through the medium of the longitudinal releasing-arms, force the plunger or

25 false bottom of the brick-mold out even with the periphery of the mold-wheel. The bricks in the molds being so displaced will fall on the apron or track underneath, from which they

30 may be removed and carried to the burning-kiln.

Hitherto brick-making machines have been exceedingly complicated in structure, large, unwieldy, and hence difficult of transportation, and very expensive as to first cost and

35 operation. This is especially true of rotary machines, the revolving mold and press wheels being provided with much fine mechanism, and the systems of cams and springs employed

40 for actuating the plungers render great care necessary to their successful operation.

It must follow, as a natural consequence, that in the operation of brick-machines a large amount of clay will fall on and over the mechanism, which, being in rapid revolution, will

45 become much worn by the cutting action of the fine clay and clay-dust; hence the fewer parts and the greater their simplicity of form and adjustment the less will a machine be

50 open to this objection.

By our invention many of these difficulties are obviated, having produced a machine simple and compact in construction, thus enabling it to be transported from one clay-field to another, composed of few parts, and therefore

less liable to become worn, and requiring few hands while being operated, adapted to run at a high rate of speed, and to turn out daily a large number of bricks, uniform in texture, regular in shape, and at a comparatively light 60 outlay.

We would have it understood that we do not limit ourselves to the exact construction and arrangement of parts shown and described, but will hold ourselves at liberty to make such 65 slight changes as come within the spirit and scope of our invention.

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

1. In a brick-machine, the combination, with 70 a mold-wheel, of a press-wheel having any desired number of compressors or blocks pivoted or hinged thereto, substantially as set forth.

2. In a brick-machine, the combination, with 75 a mold-wheel, of a press-wheel formed with radial arms having compressors pivotally attached to their extremities, substantially as set forth.

3. In a brick-machine, the combination, with 80 a mold-wheel, of a press-wheel having compressors pivotally secured thereto and furnished with rocking bearings the full width of the press-wheel.

4. In a brick-machine, the combination, with 85 a mold-wheel, of a press-wheel having a series of radial arms formed solid therewith, said arms having compressors pivoted or hinged to their outer ends, substantially as set forth.

5. In a brick-machine, the combination, with 90 the plungers having laterally-projecting arms, of toothed wheels for actuating said plungers in ejecting the molded brick from the molds of the mold-wheel, substantially as set forth.

6. In a brick-machine, the combination, with 95 a mold-wheel having a series of molds and plungers located therein, of a press-wheel elevated in vertical line over the mold-wheel, said press-wheel provided with hinged compressors, substantially as set forth. 100

In testimony that we claim the foregoing we have hereunto set our hands this 18th day of March, 1880.

MICHAEL E. SMITH.

ALEXANDER M. GLAZE.

Witnesses:

W. H. CROSS,

R. H. MOON.