(No Model.)

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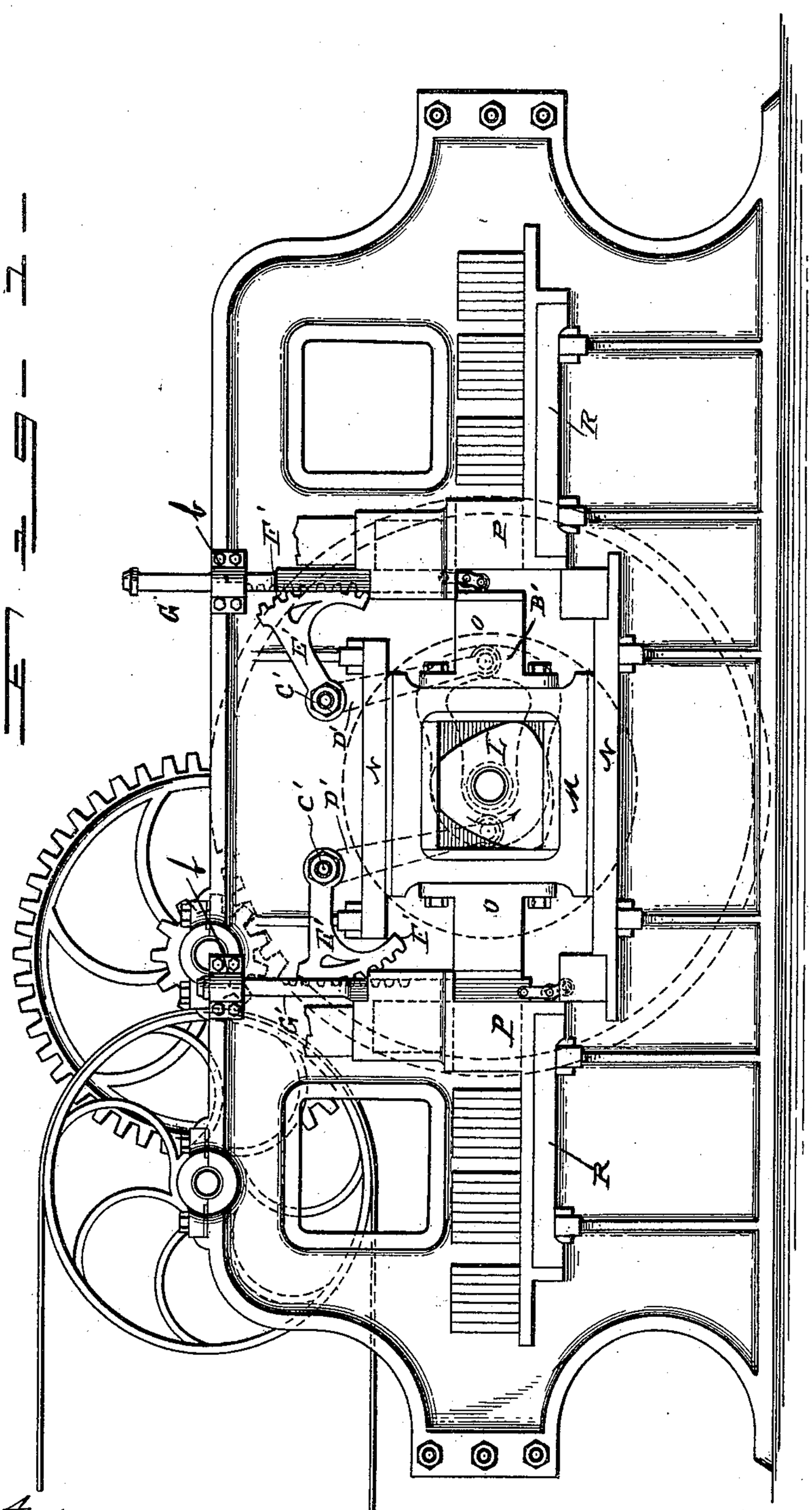
J. C. ANDERSON.

BRICK MACHINE.

No. 406,414. Patented July 9, 1889.



Witnesses,
Henry Frankfurter
Alfx Madore

Inventor,
J. C. Anderson
By
L. W. Gunckel Atty

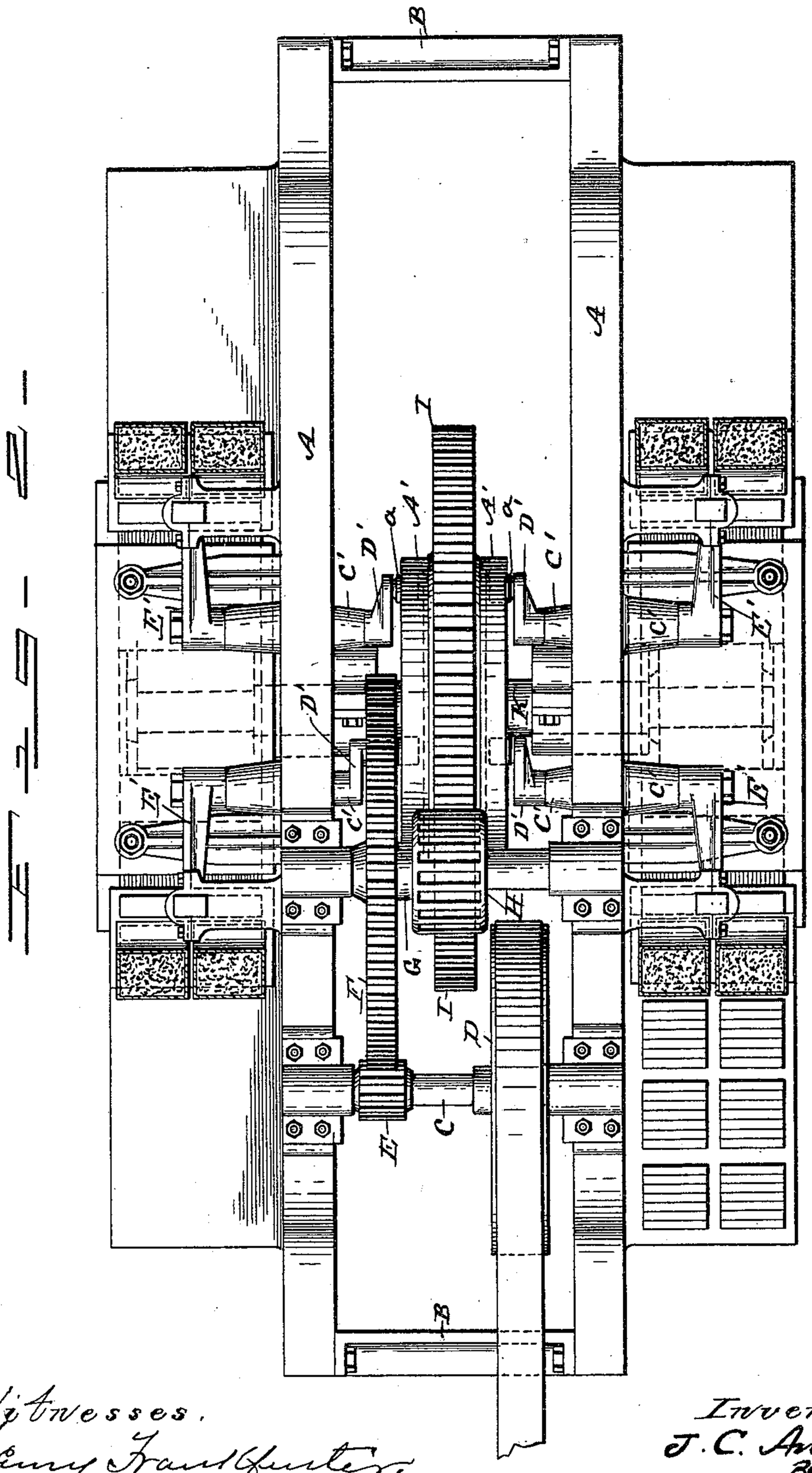
(No Model.)

4 Sheets—Sheet 2.

J. C. ANDERSON.

BRICK MACHINE.

No. 406,414. Patented July 9, 1889.



Witnesses.
Henry Faulkner,
Alfx Mahon

Inventor.
J. C. Anderson
By
L. M. Finnabaugh
Atty

(No Model.) 4 Sheets—Sheet 3.

J. C. ANDERSON.

BRICK MACHINE.

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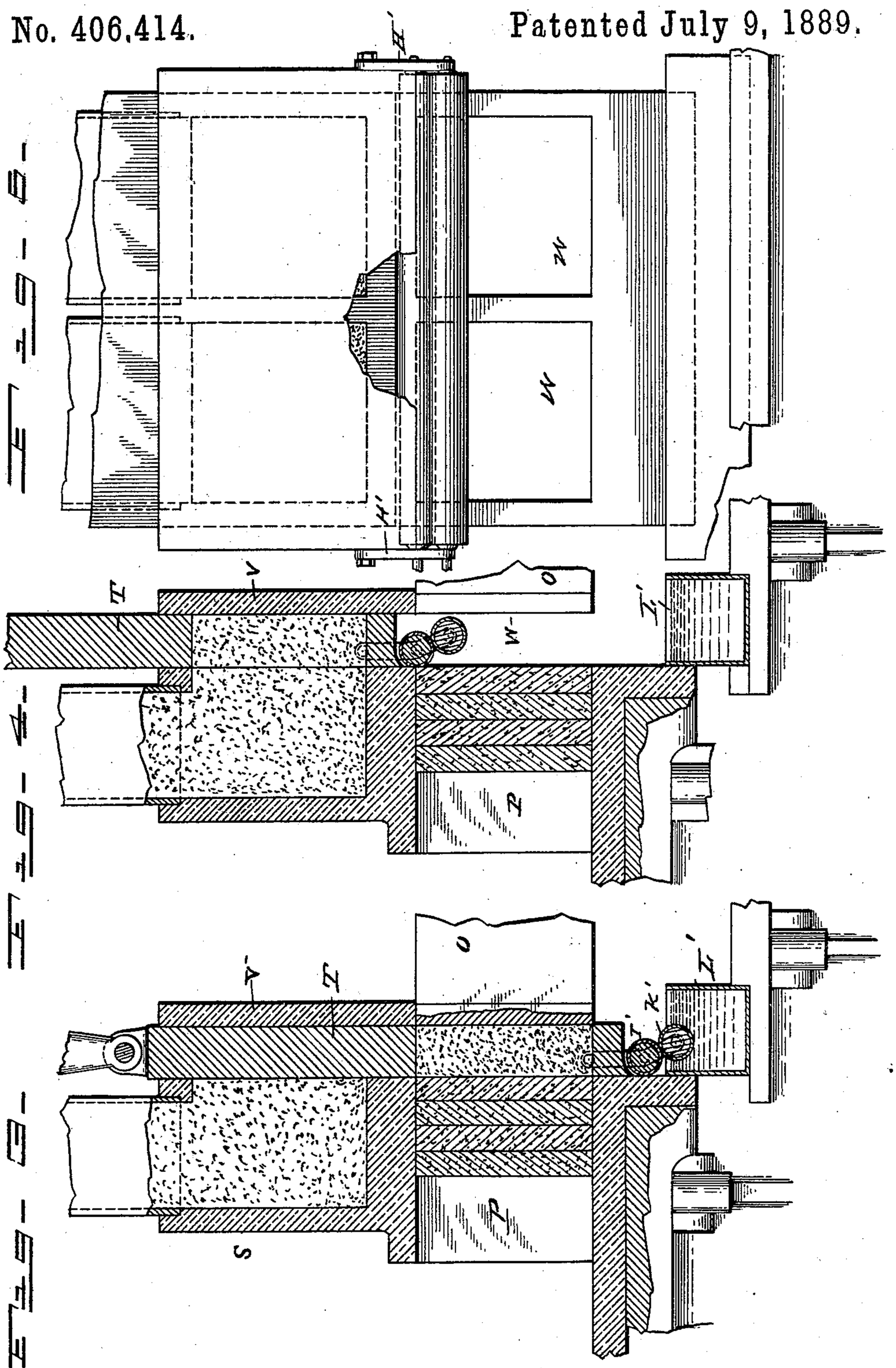


Witnesses,
Henry Frankfurter,
Alex. McIlhon

Inventor.
J. C. Anderson
By
S. McFarlaugh
atty

(No Model.) 4 Sheets—Sheet 4.

J. C. ANDERSON.

BRICK MACHINE.

No. 406,414. Patented July 9, 1889.

Fig. 6.

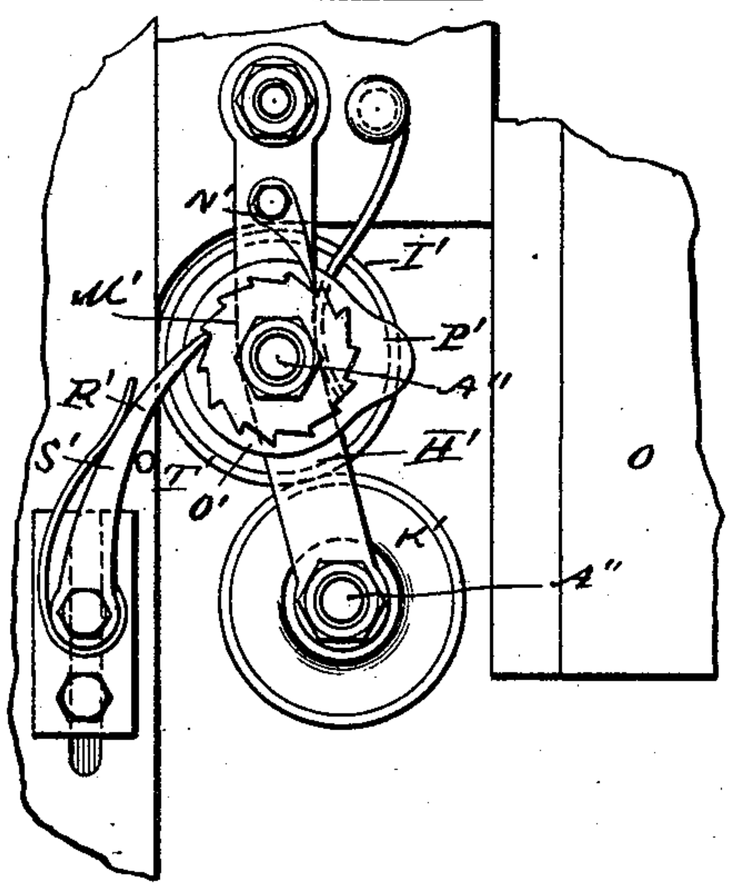


Fig. 7.

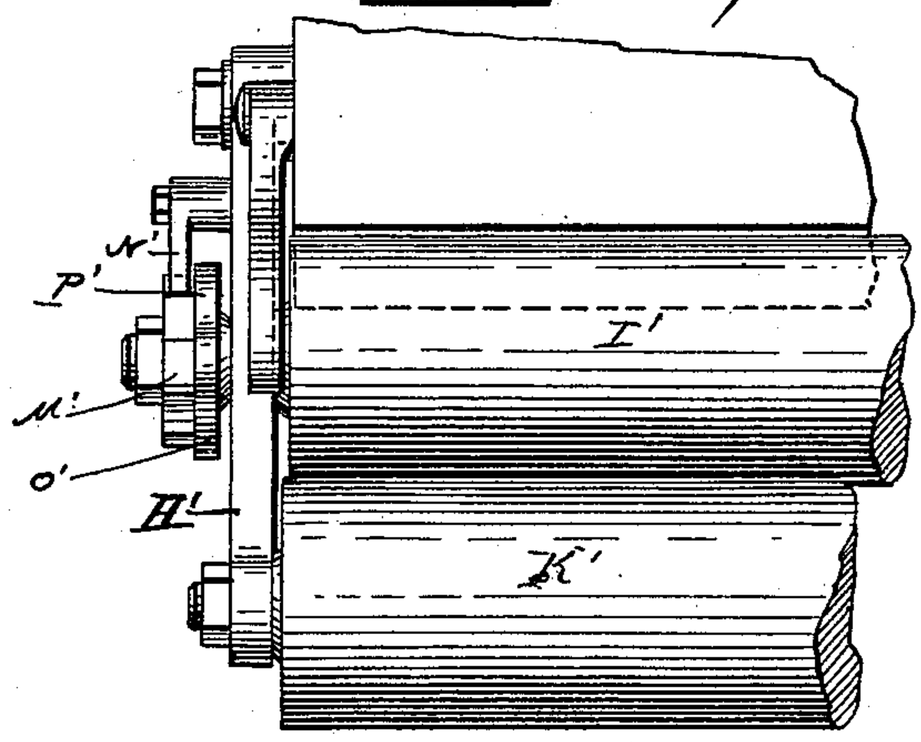


Fig. 8.

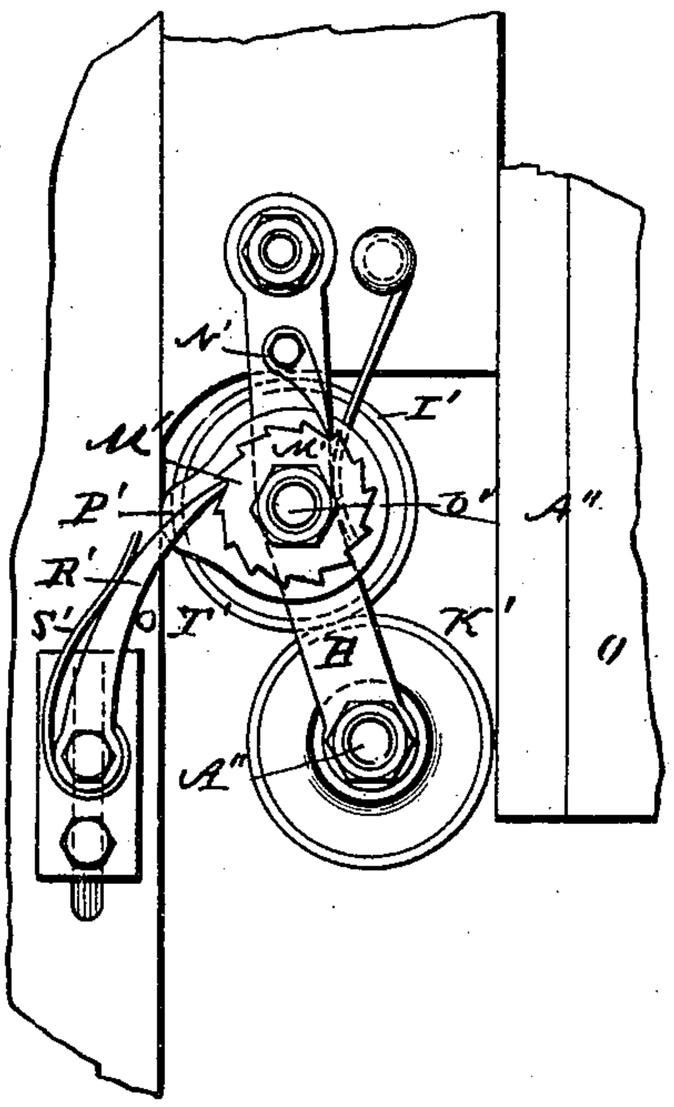
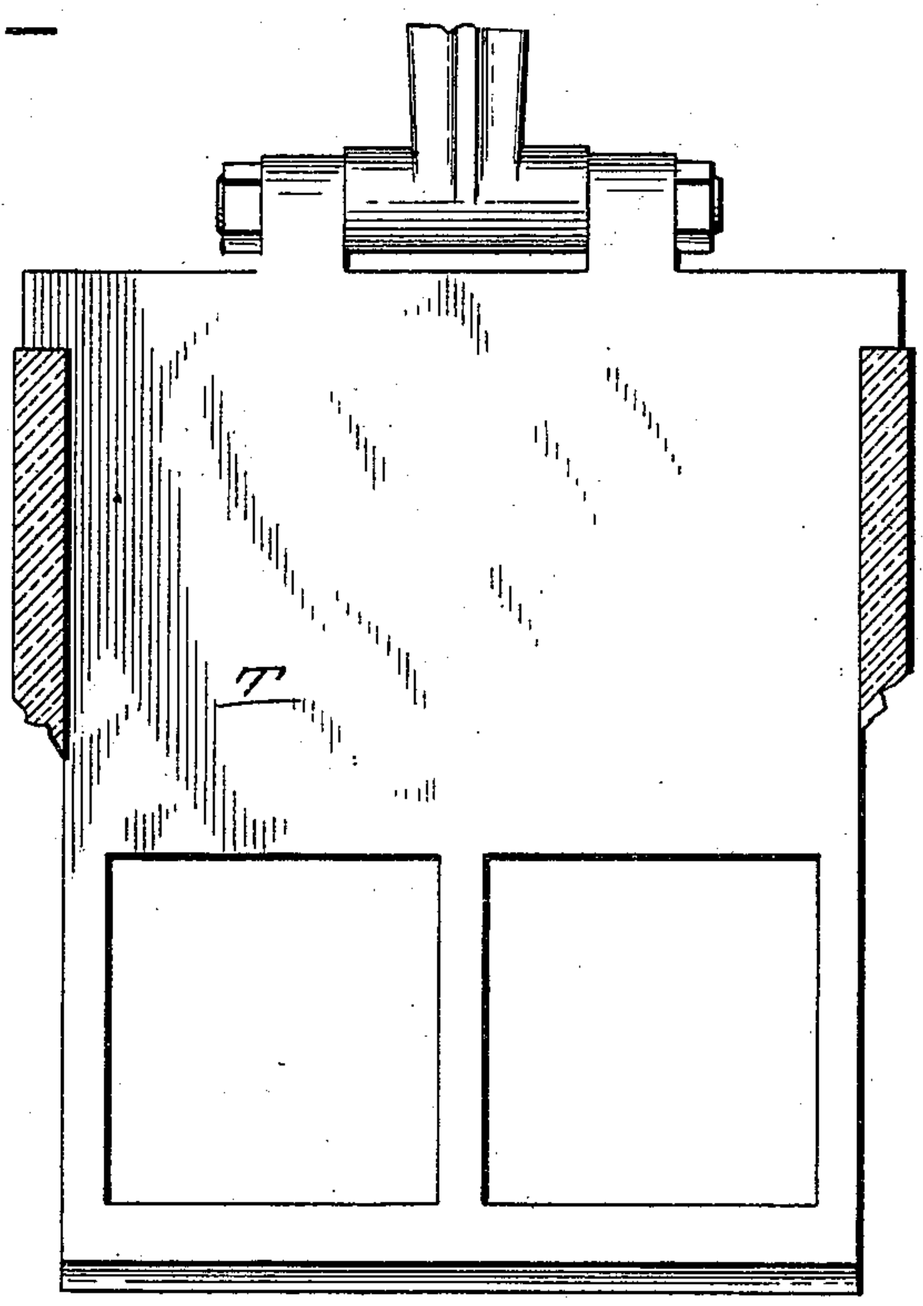


Fig. 9.



Witnesses,
Henry Frankfurter,
Alfx Mahon

Inventor,
J. C. Anderson
By
L. N. Finnaughan
atty

UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 406,414, dated July 9, 1889.

Application filed April 19, 1888. Serial No. 271,193. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. ANDERSON, a citizen of the United States of America, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Machines for Molding or Pressing Bricks and Blocks from Clay, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to machines for molding bricks, blocks, &c., from dry clay powder, and has for its object the production of bricks, blocks, conduits, columns, &c., made up of thin slabs of clay powder pressed into form and joined into larger blocks or sections, such articles being secured to me by various patents, among which may be enumerated No. 348,443, August 31, 1886, Nos. 351,612 and 351,615, of October 26, 1886, and No. 379,926, of March 27, 1888.

In the patents above referred to I have described and claimed brick or blocks made of two or more kinds of clay arranged in layers and pressed into compact form in a dry state, which, when burned, will present layers of different colors or a brick made of clay of two different kinds, the face layer being of a better quality than the main body of the brick, both clays being united or pressed into form while in a dry and powdered condition. I have also described and claimed in the patents above referred to a brick having a facing-piece of one kind of clay, said facing-piece being joined to the other part of the brick by means of a layer of vitrifiable materterial. I have also described and claimed in patents above referred to conduits, paving-blocks, &c., such conduits and blocks being made up of a series of thin slabs of dry clay powder, such slabs being secured together into one body by an intervening vitreous material.

The present mechanism is devised for pressing the dry clay into thin slabs and for applying the vitrifiable material or slip for joining the slabs into sections in one continuous operation, which will be more fully hereinafter described.

Referring to the drawings, Figure 1 is a side view of my improved machine. Fig. 2 is a top or plan view. Fig. 3 is a sectional view of the molding-chamber, clay-chamber, charging or measuring mold, plunger, and devices for moistening or applying the cementing material to the face of the newly-formed brick. Fig. 4 is a sectional view of the device shown in Fig. 3, with the charger or measuring-mold and the moistening-rolls in an elevated position. Fig. 5 is a front view of the devices shown in Figs. 3 and 4. Fig. 6 is a side view of the slip-rolls, with the ratchet-wheel and disk for holding the rolls from contact with the block. Fig. 7 is a front view of a portion of the slip-rolls. Fig. 8 is a side view of the devices shown in Fig. 6, with the disks for holding the roll from contact with the clay in position. Fig. 9 is a front view of the charger.

In an application filed by me of even date herewith, Serial No. 271,192, I have shown, described, and claimed an open-ended molding-chamber in which the impingement or friction of the newly-formed brick in their passage through the mold-chamber forms the resistance to the thrust of the plunger necessary to press the brick into form, and also devices by which a layer of wet clay is deposited on the face edge of said brick before it leaves the machine.

In this application I have shown the general mechanism embraced in the application above referred to, and also the open-ended molds or compression-chamber.

A indicates the sides of the machine, which are secured together in a substantial manner by cross bars or ties B.

C is a shaft mounted in suitable bearings in the sides of the machine, said shaft being provided with a band-puliey D, by which said shaft is driven from any suitable source of power.

E is a pinion-wheel mounted on the shaft C, which meshes with and imparts motion to the spur-wheel F on the shaft G. The shaft G is provided with a pinion-wheel H, which meshes with the gear-wheel I and imparts motion to the shaft K, on which it is mounted. Each end of the shaft K is provided with cams L, which work in yokes M, adapted to slide back and forth in suitable guides N, se-

cured to the sides of the machine, the plungers O being secured to the yokes M and worked back and forth by the cams L, as heretofore stated.

The cams L fit snugly within the yokes, and are so formed and constructed as to have a constant bearing upon the yokes, to properly time and operate the plungers for alternately exerting pressure in each direction at each revolution of the shaft K.

The mold cavities or chamber P are supported by the brackets or tables R, and are open at their rear ends to allow the blocks to be pushed out onto the tables R.

S are the clay receptacles or spouts located above the mold-chamber, the tops of the mold-chambers forming the bottoms of the clay receptacles or spouts. One side of the lower end of the feed-spout is open, so as to allow the clay to enter the charger T, one side of said charger being closed by the plate V when said charger is receiving its load of clay. The lower end of the plates V are provided with apertures W, through which the plungers operate to force the clay out of the charger and compress it against the previously-formed brick or block in the mold-chamber P. The chargers T are adapted to work up and down in suitable guideways formed between the clay-spout S and plate V and in front of the molding or compression chambers P, said chargers being operated by the devices which will now be described.

A′ are disks or projections secured to the shaft K on each side of the gear-wheel I, said disks being provided with cam-grooves B′. (See dotted lines in Fig. 1.)

C′ are shafts mounted in suitable bearings in the sides A of the machine, the inner ends of said shafts being provided with crank-arms D′. The outer ends of the crank-arms D′ are provided with studs *a*, which project into the cam-grooves B′, said studs being provided with suitable friction-wheels to prevent the parts from wearing away too rapidly, and also to allow the parts to work more readily. The outer ends of the shafts C′ are provided with crank-arms E′, having toothed sectors F′ at their outer ends, which engage with teeth formed on the bars G′. The bars G′ are secured to the upper ends of the chargers T and work in suitable guides *b*, formed on the sides of the machine.

It will be noticed that as the shaft K revolves the cams B′ operate on the levers and shafts just described to raise and lower the chargers, and by which means the clay is brought down in front of the mold-boxes or compression-chambers to be operated upon by the plungers.

It will be understood that a short vibratory motion is given to the plungers O by the cams L, which causes the plungers to enter and withdraw from the chargers T alternately, compressing each of the charges of clay powder into thin slabs, and driving the said slabs forward into the mold-chamber P to a point to register with and be even with the end of the mold-chamber, so as to admit of the upward movement of the charger and allow the rolls I′ to moisten or deposit the cementing material onto the side of the newly-formed block, which takes place at each ascending and descending movement of the charger. It will also be understood that in molding these thin slabs, where the pressure is applied separately to each of the slabs in detail, I use an intervening slip to cause the respective slabs to adhere to each other. This slip is by preference made of clay and water mixed to about the consistency of milk; or I may add one or more of the clay fluxes to the solution for lowering the burning-point or increasing the vitreous qualities of the bodies; or by moistening the side of the block previously molded the other part will adhere thereto and the joint itself will be rendered more vitreous than the main body after the burning has taken place.

The devices by which I apply the cementing material will now be described.

H′ are arms or brackets pivoted at each side of the charger and in which the shafts A″ are mounted.

I′ and K′ are rolls loosely mounted on the shafts A″, said rolls being covered with felt or other suitable material which will absorb and spread the slip, and are so mounted in their bearings that their peripheries touch each other.

L′ is a tank for holding the slip or other cementing material mounted on suitable supports below the front ends of the molds or compression-chambers P, and in such relation to the charger that the lower roll K′ will enter the water or slip in the tank L′ when the charger is in its lowest position. The slip which is absorbed by the roll K′ is transmitted to the roll I′ by capillary attraction and by the turning of the roll I′ as it comes in contact with the face of the newly-formed brick. This causes the roll K′ to revolve also, and evenly wets or coats the surface of the roll I′ with the slip from the tank L′. When it is desired not to cement the respective slabs together, or when a sufficient number of slabs have been joined to complete the section or block of the length desired, the roll is kept from contact with the face of the block, so that no cementing material is applied and no bond or union will take place between the block and the next slab molded.

I do not wish to limit myself to the above-described devices for depositing the slip or other cementing material between each layer of pressed clay, as it is obvious other devices may be employed without departing from the spirit of my invention, or the slip may be deposited by hand while the charger is in an upward position.

I will now describe the devices by which the series of clay slabs may be separated into blocks of any desired size.

M′ is a ratchet-wheel mounted on the shaft

A″ of the roll I′, said ratchet-wheel being held in position by the pawl N′.

O′ is a disk secured to the side of the ratchet-wheel M′, said disk O′ being provided with an enlarged portion P′, for a purpose which will be described hereinafter.

R′ is a pawl adjustably secured to the sides of the mold-chambers, said pawl being held in engagement with the ratchet-wheel M′ by means of the spring S′, a stud or pin T′ being secured in front of the pawl R′ to prevent it from getting out of position.

When the charger in its movement downward to the compression-chamber reaches a point near the bottom of its stroke, the pawl R′ engages with the ratchet-wheel M′ and moves it one step in its revolution; and when said ratchet-wheel has made one revolution the projecting portion P′ will come in contact with the edge of the mold-chamber and prevent the roll I′ from coming in contact with the previously-formed slab, as shown in Fig. 8. This prevents the roll from depositing the slip on the brick exposed in the end of the compression-chamber and prevents the slabs at this point from becoming joined or cemented together. The adjustment of the pawl R′ enables me to move the ratchet-wheel M′ and disk O′ a greater or less distance, and thus make the blocks of any desired size—*i. e.*, with three, four, or five or more clay slabs in each block, as occasion may require.

One important feature of my invention is that the movement or travel of the plungers for compressing the clay is shortened by this mechanism to such an extent as to increase largely the force and output of the machine; and I have utilized the backward motion, which has heretofore been lost, in compressing a charge of clay, as well as in the forward movement of said plunger, whereby each revolution of the cam-shaft is made to do double duty, and the other end of the cam-shaft is made to do duty in a like manner, and the machine is capable of making four sets of blocks at each revolution of the cam-shaft.

The charger is made to receive the charge of clay from the spout above the mold-box or compression-chamber, so that in carrying the said charge of clay downward the drag upon the body of clay within the spout and the gravity will cause the upper edge of the charger to be fully filled, and thus insure equal solidity to the top part of the slab when molded, which would not be the case if the charge were taken in from the sides or from beneath the compression-chamber.

What I claim is—

1. A machine for making large bodies and shapes from clay, in which the compression-plungers press a thin slab of clay onto a series of similar slabs or layers in an open-ended mold, and rolls or described equivalents for depositing a layer or film of slip or vitrifiable or cementing material between each slab, as set forth.

2. In a machine for making blocks of a series of thin clay slabs, an open-ended mold-chamber, a feed-charger working in front of the mold-chamber, and a plunger working into and through the charger to press the clay and compact it against the previously-formed blocks in the compression-chamber, as set forth.

3. In a machine for making blocks, columns, &c., of a series of thin clay slabs, an open-ended mold-chamber, a charger working in front of the mold-chamber, said charger being provided with rolls for depositing a slip between the layers or slabs, and a plunger working into and through the charger to press the clay therefrom and compact it against the previously-formed blocks in the compression-chamber, as set forth.

4. In a machine of the character described, the clay spouts or chambers located above the compression-chamber and communicating with the vertically-moving charger at the side thereof, the plate V for closing one side of the charger, and devices, substantially as described, for moving the charger up and down in front of the compression-chamber, as set forth.

5. The shafts C′, having the crank-arms D′, adapted to engage cam-grooves B′, and with the arms E′, having the toothed sectors F′ to engage the rack-bars G′ of the chargers, whereby said chargers are moved up and down in front of the compression-chambers.

6. In a machine of the character described, the clay-charger T, in combination with the rolls I′ and K′ and the slip-trough L′, whereby a film or layer of slip is deposited on the face of the newly-formed slab at each movement of the charger, as set forth.

7. The ratchet-wheel M′ and disk P′, mounted on the shaft of the slip-roll I′, in combination with the pawls N′ and R′, whereby, when the ratchet-wheel and disk have made one revolution, the roll I′ will be held from contact with the clay slab and the block separated at this point.

In testimony whereof I affix my signature in presence of two witnesses.

J. C. ANDERSON.

Witnesses:

L. W. SINSABAUGH,

J. C. STODDARD.