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J. W. & G. W. FERGUSON.
BRICKMAKING MACHINE.

APPLICATION FILED OCT. 5, 1905.

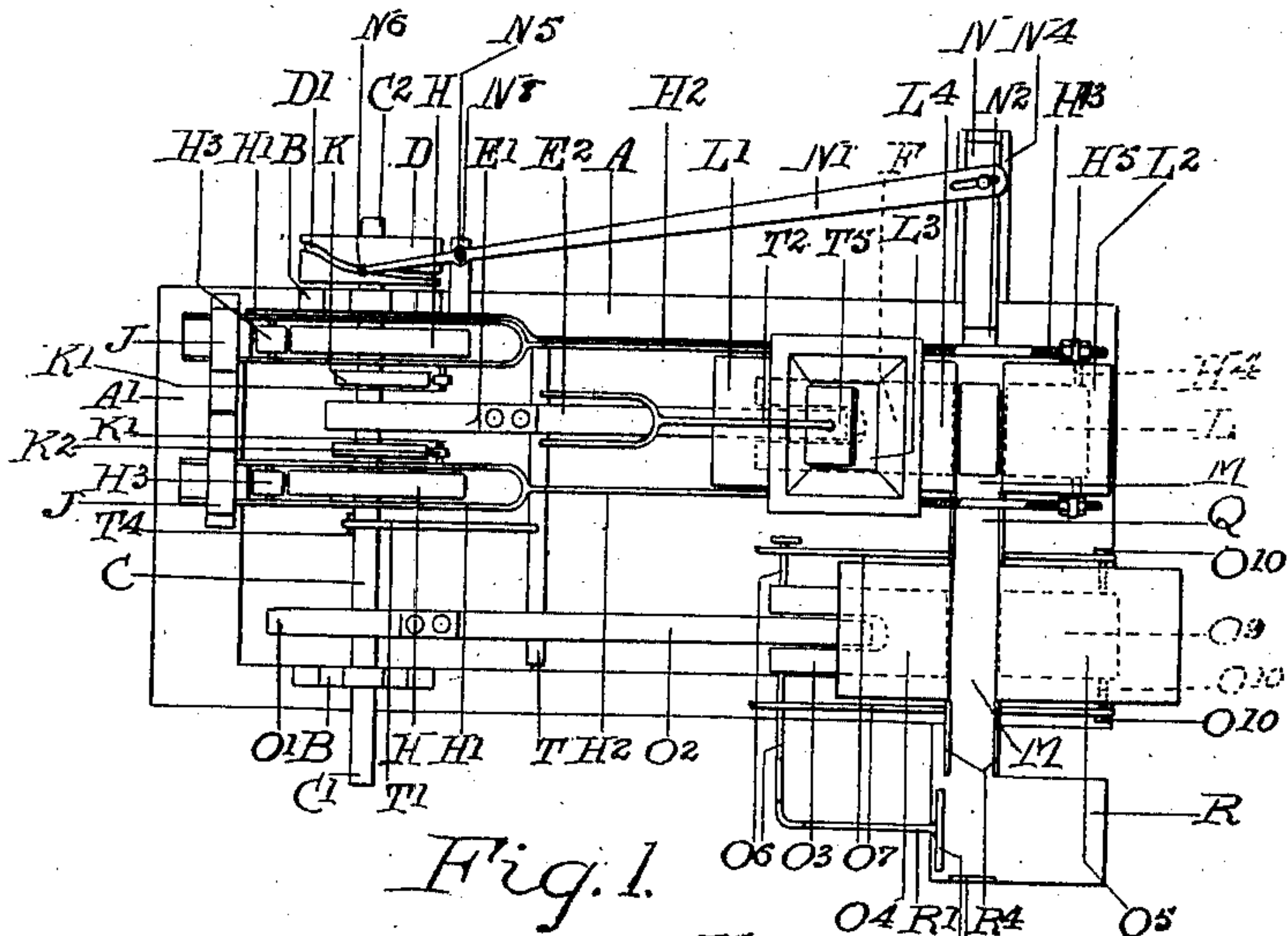


Fig. 1.

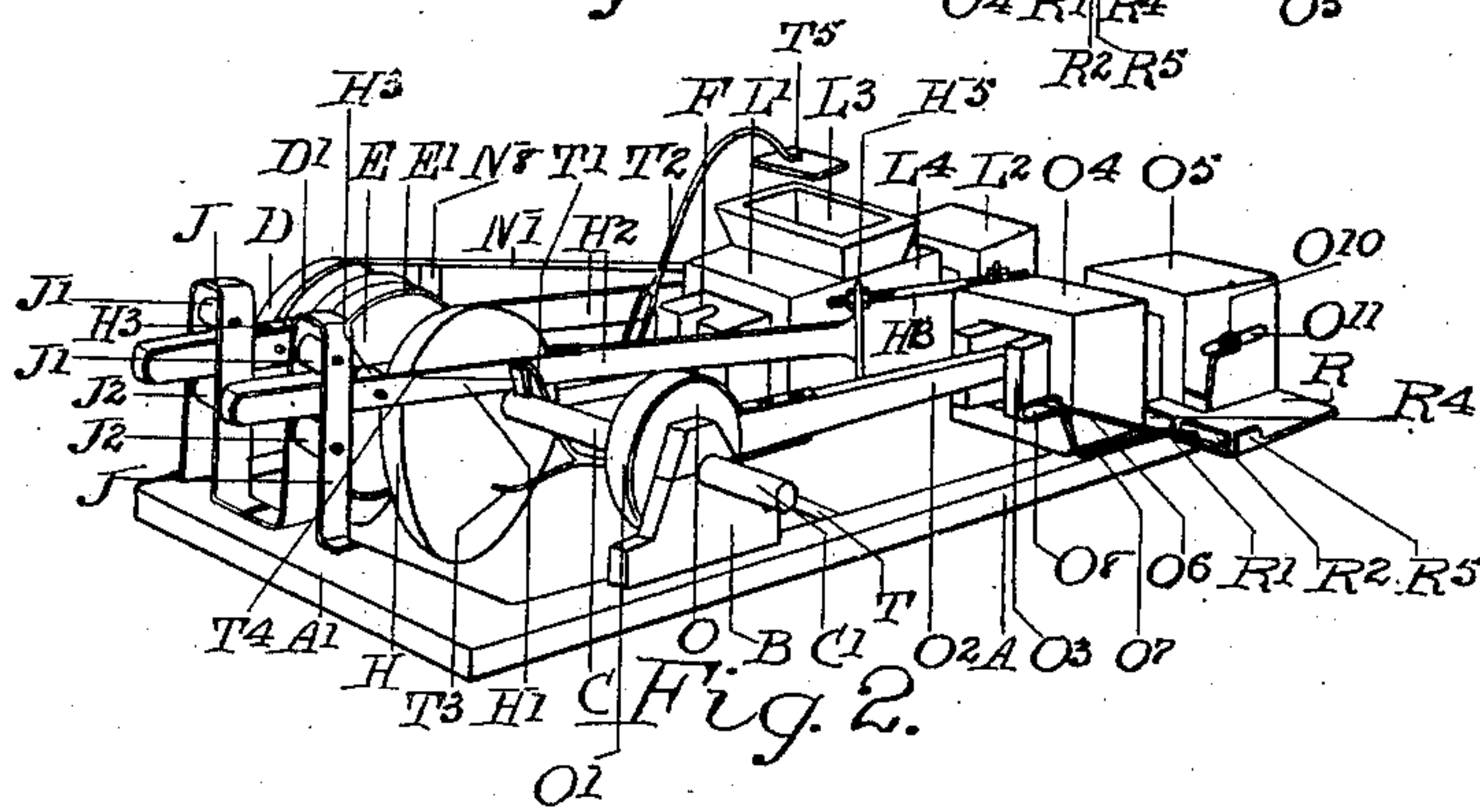


Fig. 2.

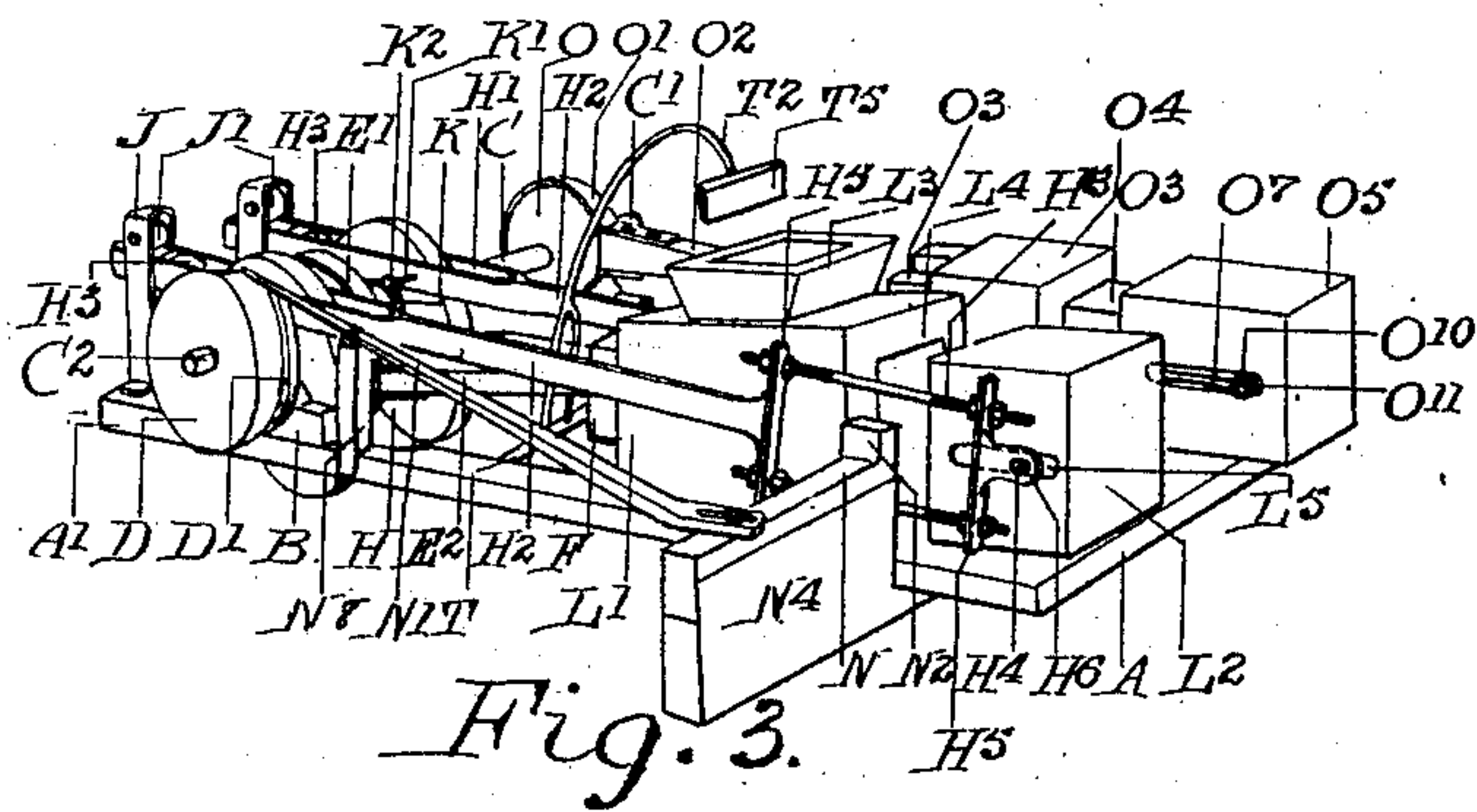


Fig. 3.

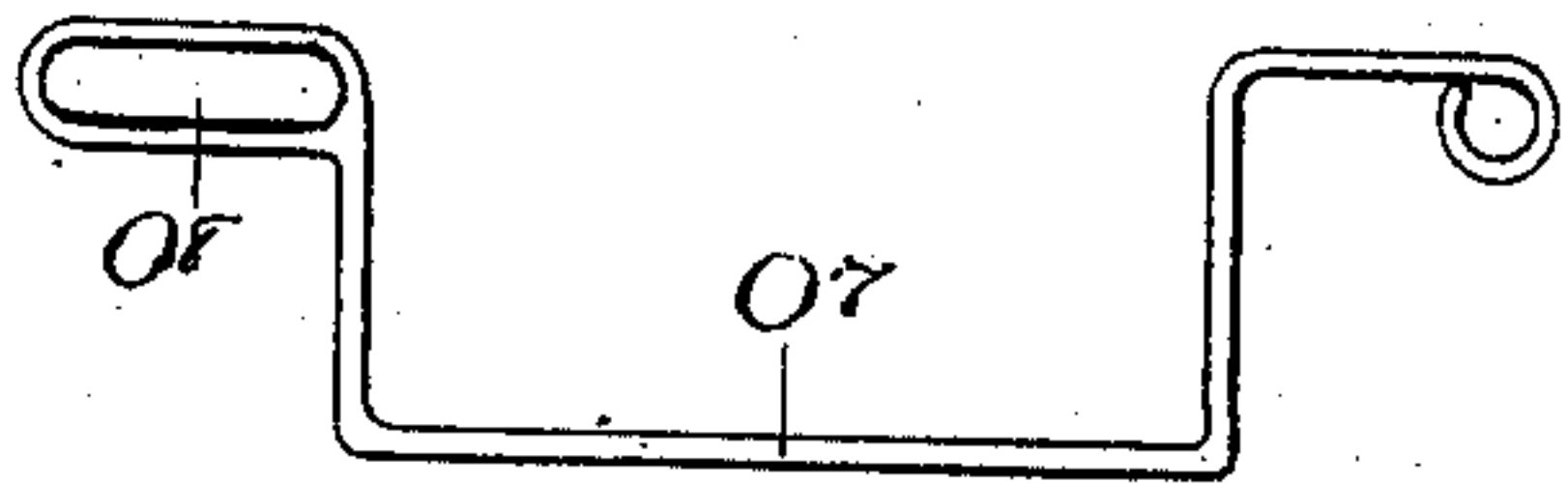


Fig. 4.

Witnesses
Philip Ferrell
C. S. Brundage

Inventors
Joseph W. Ferguson.
and George W. Ferguson.
by R. G. Dyrenforth,
Att'y.

UNITED STATES PATENT OFFICE.

JOSEPH WELLINGTON FERGUSON AND GEORGE WELSH FERGUSON, OF
WANGARATTA, VICTORIA, AUSTRALIA.

BRICKMAKING-MACHINE.

No. 837,818.

Specification of Letters Patent.

Patented Dec. 4, 1906.

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To all whom it may concern:

Be it known that we, JOSEPH WELLINGTON FERGUSON and GEORGE WELSH FERGUSON, brickmakers, subjects of the King of Great Britain and Ireland, residing at Sydney Road, Wangaratta, in the county of Moira, State of Victoria, Commonwealth of Australia, have invented certain new and useful Improvements in Brickmaking-Machines, of which the following is a specification.

The object of our invention is to provide a cheap and effective machine for making bricks for building or other purposes.

Referring to the drawings which form a part of this specification, Figure 1 is a plan of our machine. Clay has filled the feed-hopper and portion of the charge has been carried onto the molding-compartment and there been compressed. A brick is, as shown, discharged after its first compression. The bend in the sinuous groove on the circular disk D is about to approach the ejecting-lever and move the molded brick along the brick-slide toward the second compressing-compartment. The molding-block is near the outer extremity of its travel, as is also the molding-ram. The compressing-ram is near the nearest extremity of its travel, as is also the compressing-block. Fig. 2 is a perspective view of one side of the machine. The molding ram and block are nearer the inner extremity of their travel than the outer, the compressing ram and block being nearer their outer extremities than their inner. Fig. 3 is also a perspective view of the machine looking at it from the ejector-lever side. Fig. 4 is a side elevation, on an enlarged scale, of the crank-shaped rod moving the compression-block.

Similar letters of reference indicate similar or corresponding parts where they occur in the several views.

Our invention includes a base-plate A, one end of which is hereinafter called the "shaft" end A'. Upon the shaft end A' are bearings B. In these bearings turns a shaft C, which shaft overhangs the said bearings on each side. On one overhanging end C' of the aforesaid shaft is situated a fast and a loose driving-pulley or other suitable driving-gear. On the other overhanging end C² is attached a circular disk D. In the circumference of

this is a sinuous groove or recess D', hereinafter referred to.

Between the two bearings and on the side of the machine nearest to the circular disk is an eccentric E. (See Fig. 2.) Around this eccentric is an eccentric-strap E', to which is attached the inner end of an eccentric-rod E². The back end of the rod is pivoted to a ram F, hereinafter called the "molding-ram." This ram moves backward and forward within the guide-case L'. On each side of the said eccentric and attached to the shaft are disk cams H. On each side of each cam is the leg H' of a forked cam-rod H². The legs H' or inner ends of each cam-rod reciprocate in guides in the top of guide-pillars J, attached to the base-plate. Between each pair of forked legs H' is situated a roller H³, so that a rolling contact with the disk cam is formed.

Each guide J is provided with upper and lower rollers J' and J². (See Fig. 2.) Mounted on the shaft, one on each side of the eccentric and between the said eccentric and the cam-disk, are two smaller return-cams K. (See Fig. 1.) Each one of these engages with a stud K', having a roller K² thereon protruding from the inner forked leg H' of the cam-rod H². The object of the said cams is the quick return of the cam-rods H². At the outer end of each cam-rod are vertical extensions H⁵. To these are attached adjusting-bolts H³. At the outer extremity of each adjusting-bolt and connected to the bolts by a link H⁶ (see Fig. 3) is the outer end of a pin H⁴. The inner end of the said pin passes through the walls of the molding-block guide-case L² and is attached to the molding-block L (seen in dotted lines in Fig. 1) inside the said case. The said pin works in slots L⁵.

Situated on the box end of the base-plate is a molding-ram guide-case L'. In line with this is the molding-compartment L⁴. Inside the case and the compartment moves the ram F hereinbefore referred to. Situated above the top of the molding-ram guide-case is a feed-hopper L³. Into this the material to be compressed is charged. The section of the guide-case and molding-compartment is equal to the length and width of a brick. Across the passage-way formed between the molding-compartment L⁴ and the

molding-block guide-case L^2 is a brick-discharge passage M.

On the same side of the box as the circular disk D, before referred to, is placed an ejector N. This has upon its striking end a head N^2 , of felt or any other material which may be saturated with oil or other liquid. The said ejector works in guides N^4 and is moved backward and forward by an ejecting-lever N^1 . The said ejecting-lever is pivoted by a pin N^5 to a pillar N^8 , attached to the base-plate of the machine. The inner end, by a roller mounted on a pin N^6 , (see Fig. 1,) engages with the groove in the circular disk D and the other end engages with the ejector N.

On the shaft end nearest the driving-pulley, but inside the adjacent bearing, is a small eccentric O. Around this is an eccentric-strap O^1 , to which is attached the inner end of an eccentric-rod O^2 . The outer end of this eccentric-rod is pivoted to the compressor-ram O^3 , which moves backward and forward in the guide-case O^4 . Separated from the guide-case O^4 by a brick-discharge passage M is the second compressing-compartment and compressing-block guide O^5 .

Two studs or pins O^6 protrude from the sides of the compressor-ram O^3 . Connected to these studs or pins are the inner ends of crank-shaped rods O^7 . These inner ends have slots O^8 , which slots work longitudinally on the said studs. The outer end of the said cranked rods O^7 are pivoted to the pin O^{10} , protruding from a compressor-block O^9 . (Shown in dotted lines in Fig. 1.) The said compressor-block O^9 is moved backward and forward within the compressing-compartment O^5 , and its outer movement from the said compressing-compartment is prevented by the back of such case, or, if an open case be used, by a limit-stop of any character.

Suitable scrapers to scrape any fins formed while the bricks are being compressed are placed where necessary. Suitable oil-pads are also provided if and where necessary.

Between the brick-discharge passages M is placed a bridge-piece Q. Upon one or both sides of the said bridge-piece may be placed an oil-pad, or suitable guides may be provided. On the side of the compressing-compartment is a brick-discharge platform R. This platform has scrapers R^4 and, if necessary, a guide R^5 . Attached to the outer stud O^6 on the compressor-ram O^3 is a pusher-arm R^1 . To this is attached a head or plate R^2 . This pusher-arm as it moves outwardly forces the bricks down the discharge-platform R.

The ramming-faces of the rams and blocks are provided with metallic liners. Both the molding and compressing compartments may also be provided with liners.

Situated between the shaft end and the box end of the base-plate is a transverse

rocking shaft T. To this is attached the lower end of an arm T^2 , on the upper arm of which is placed the ramming-plate T^5 . There are also attached to the said rocking shaft the inner ends of arms T^1 and T^3 . (See Fig. 2.) The outer ends of said shaft make contact with a stud or projection T^4 which extends from the shaft C. When the stud or projection T^4 strikes the upper arm T^1 , the ramming-plate is forced down upon the clay, whereas when it strikes the lower one T^3 it lifts the said ramming-plate.

The cycle of operations with our invention is as follows: The clay is dropped into the feed-hopper L^3 . The ramming-plate T^5 then descends on top of it. The molding-ram F moves outwardly and forces a charge past the hopper-mouth toward the molding-compartment L^4 . At the same time the molding-block L, by the disk-cams H and cam-rods H^2 , is being drawn inwardly toward the said charge within the molding-compartment L^4 . The said molding-block L passes over the brick-discharge passage M. The correct degree of compression having been arrived at, the ram F still moves outwardly. The block L reverses its motion and also moves outwardly, the rods H^2 being moved backward by the return-cams K. A brick is thus left in the brick-discharge passage M. The ejector N then forces it onto the brick-slide Q and retires. When the second brick is forced from the molding-compartment and is pressed by the ejector N, the first brick is moved on the slide Q. The third brick forces the first opposite the mouth of the compressing-compartment and compressor-guide O^5 . The compressor-ram O^3 forces it into the said compartment O^5 and it is there retarded by the compressor-block O^9 and by the limit-stop in the said compartment if an open case is used. After this second compression the compressor-ram O^3 moves inwardly, and as it does so the studs or pins O^6 drag the crank-rods O^7 inwardly, thereby also drawing inwardly the compressor-block O^9 . This leaves the brick on the brick-discharge passage M, and on the next movement of the ejector N the said brick is pushed to the brick-discharge platform R. From this it is forced outward by the plate R^2 on the brick-moving arm R^1 .

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

1. In a brickmaking-machine, the combination of a chamber, movable compressor members arranged to compress a brick within and to remove the brick from said chamber, an ejector arranged to remove the brick laterally from between said members, and means for delivering the brick at right angles to the direction of ejection.

2. In a brickmaking-machine, the combination of a chamber, movable compressor

members arranged to compress a brick within and to remove the brick from said chamber, an ejector arranged to remove the brick laterally from between said members, and parallel scrapers between which the brick is ejected.

3. In a brickmaking-machine, the combination of a chamber, movable compressor members arranged to compress a brick within and to remove the brick from said chamber, an ejector arranged to remove the brick laterally from between said members, scrapers between which the brick is ejected, a table upon which the ejected brick is received, and means for delivering the brick across said table at right angles to the direction of ejection.

4. In a brickmaking-machine, the combination of a chamber, movable compressor members arranged to compress a brick within and to remove the brick from said chamber, an ejector arranged to remove the brick laterally from between said members, parallel scrapers between which the brick is ejected, a scraper arranged at right angles to said parallel scrapers, and a delivery member arranged to force the brick past the last-mentioned scraper.

5. In a brickmaking-machine, the combination of a compressor-chamber, movable compressor members arranged to compress a brick within and to remove the brick from said chamber, an ejector arranged to remove the brick laterally from between said members, and a delivery member carried by one of said compressor members and arranged to operate upon the brick subsequent to ejection.

6. In a brickmaking-machine, the combination of a chamber, movable compressor members arranged to cooperate with said chamber, means for imparting reciprocatory movement to one of said members, and lost-motion connection between the members.

7. In a brickmaking-machine, the combination of a chamber, a reciprocatory compressor member adapted to move therein, means for imparting reciprocatory movement to said member, a second reciprocatory compressor member arranged to cooperate with the first, and connection between said members whereby the second derives its motion from the first.

8. In a brickmaking-machine, the combination of a chamber, a reciprocatory compressor member adapted to move therein, means for imparting reciprocatory movement to said member, a second reciprocatory compressor member arranged to cooperate with the first, and mechanical connection between said members constructed to impart the movement of the first member to the second for a portion only of the travel of the former in either direction.

9. In a brickmaking-machine, the combi-

nation of a chamber, a reciprocatory compressor member adapted to move therein, means for imparting reciprocatory movement to said member, a second reciprocatory member arranged to cooperate with the first, and slotted-link connection between the two members.

10. In a brickmaking-machine, the combination of a molding-compartment, a hopper connected therewith, a rock-shaft, an arm and rammer-blade carried by said shaft in cooperative relation with the hopper, a forked arm projecting from said shaft, a rotary shaft, and means carried by the rotary shaft for operating upon the forked arm to produce oscillatory movement of the rock-shaft.

11. In an improved brickmaking-machine a shaft mounted in bearings on a base-plate, said shaft being driven by suitable driving-gear from one overhanging end, a circular disk on the other overhanging end, a sinuous groove on the circumference of the said circular disk, an eccentric-disk and two disk-cams on said shaft, a smaller eccentric-disk on said shaft, an eccentric-strap around the larger eccentric, an eccentric-rod attached to said strap, a molding-ram pivoted to said eccentric-rod, an eccentric-strap on the smaller eccentric, an eccentric-rod attached to said strap, a compressor-ram pivoted to said eccentric-rod, a stud or projection on the said shaft, two smaller cams on the said shaft for engaging with studs on forked cam-rods, all as and for the purposes hereinbefore described and as illustrated in the drawings.

12. In an improved brickmaking-machine a molding-box having a receiving-aperture, above which is a hopper, said molding-box being in two compartments and having a passage-way and a brick-discharge between said compartments, an ejector working in slides mounted upon the base-plate, said ejector having a head, an oil-pad on said head, a scraper situated behind the said head, an ejector-lever adjustably connected to the ejector and intermediately pivoted to a pillar upon the base-plate, a pin in or on the other end of said lever, a roller on said pin, which roller engages in the sinuous groove in the circular disk, two forked cam-rods, the inner extremities of which reciprocate in guides, guide-pillars attached to the base-plate, rollers in said pillars, rollers in said extremities which rollers engage the rollers in the guide-pillars, studs or projections near said extremities, said studs or projections having rollers thereon the outer ends of the said cam-rods being pivoted to a cross-pin moving in slots in the said molding-box, a molding-block intermediately pivoted by the said cross-pin, adjusting bolts and nuts on the said cam-rods and on each side of the molding-box, all as and for the purpose hereinbefore described and as illustrated in the drawings.

13. In an improved brickmaking-machine
a compressor-box, said compressor-box being
in two compartments and having a receiving
and a brick-discharge passage-way, a plat-
5 form on the brick-discharge end of said box,
scrapers on said platform, a guide on said
platform, a stud or pin protruding from each
side of the compressor-ram, crank-shaped
rods having slots in their inner ends, in which
10 move the said studs or pins, the other ends of
the said crank-shaped rods being pivoted to a
cross-pin moving in slots in the said com-
pressor-box, a compressor-block intermedi-
ately pivoted by the said cross-pin, an arm

connected at one end to the outer pin or stud 15
on the compressor-ram, a head or plate on
the other end of said arm, all as and for the
purposes hereinbefore described and as illus-
trated in the drawings.

In testimony whereof we affix our signa- 20
tures in the presence of two subscribing wit-
nesses.

JOSEPH WELLINGTON FERGUSON.
GEORGE WELSH FERGUSON.

Witnesses:

JAMES LINDNER,
WILLIAM PITT CHALMERS.