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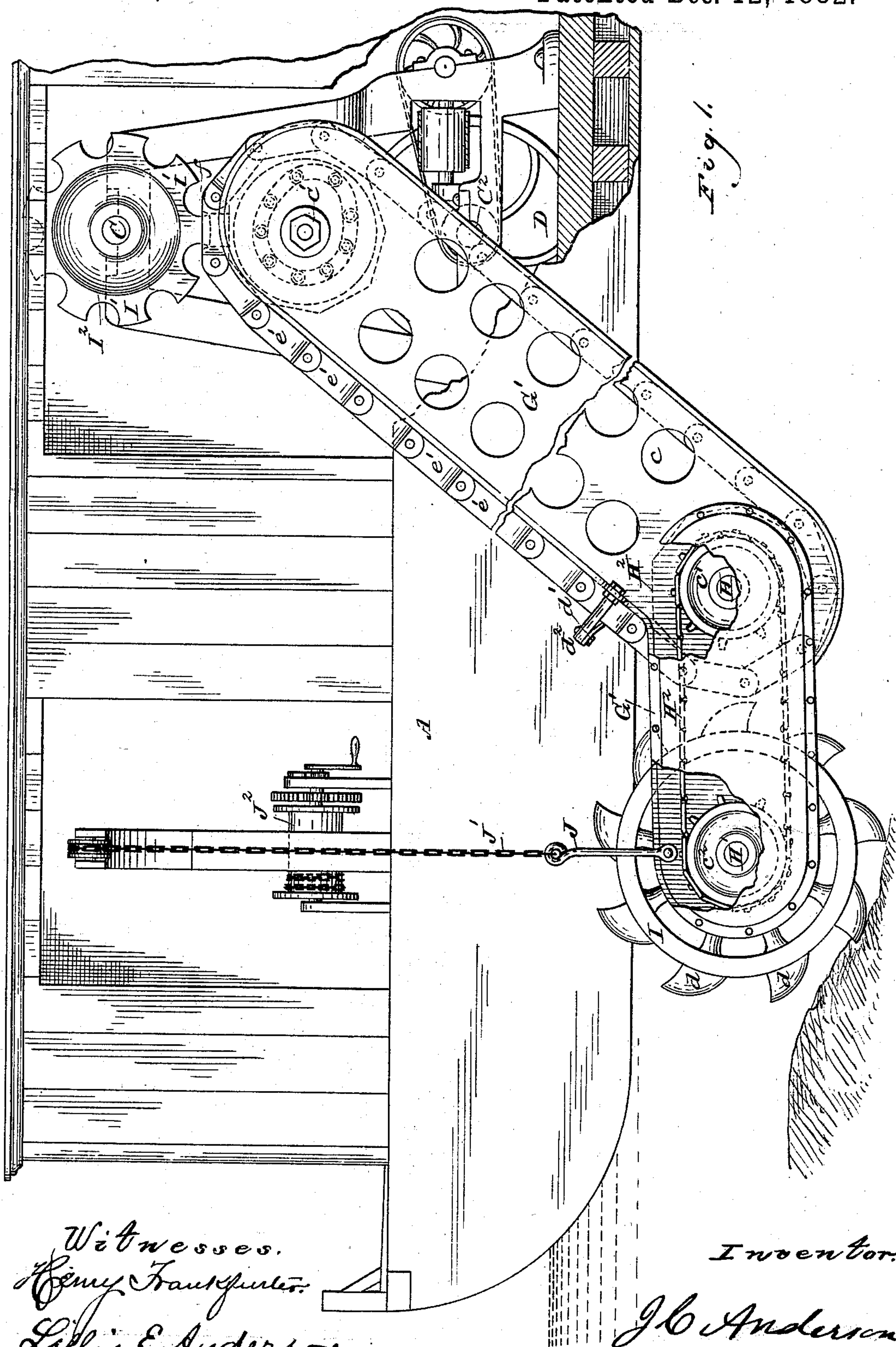
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J. C. ANDERSON.

METHOD OF AND APPARATUS FOR MAKING BRICK.

No. 268,976.

Patented Dec. 12, 1882.



(No Model.)

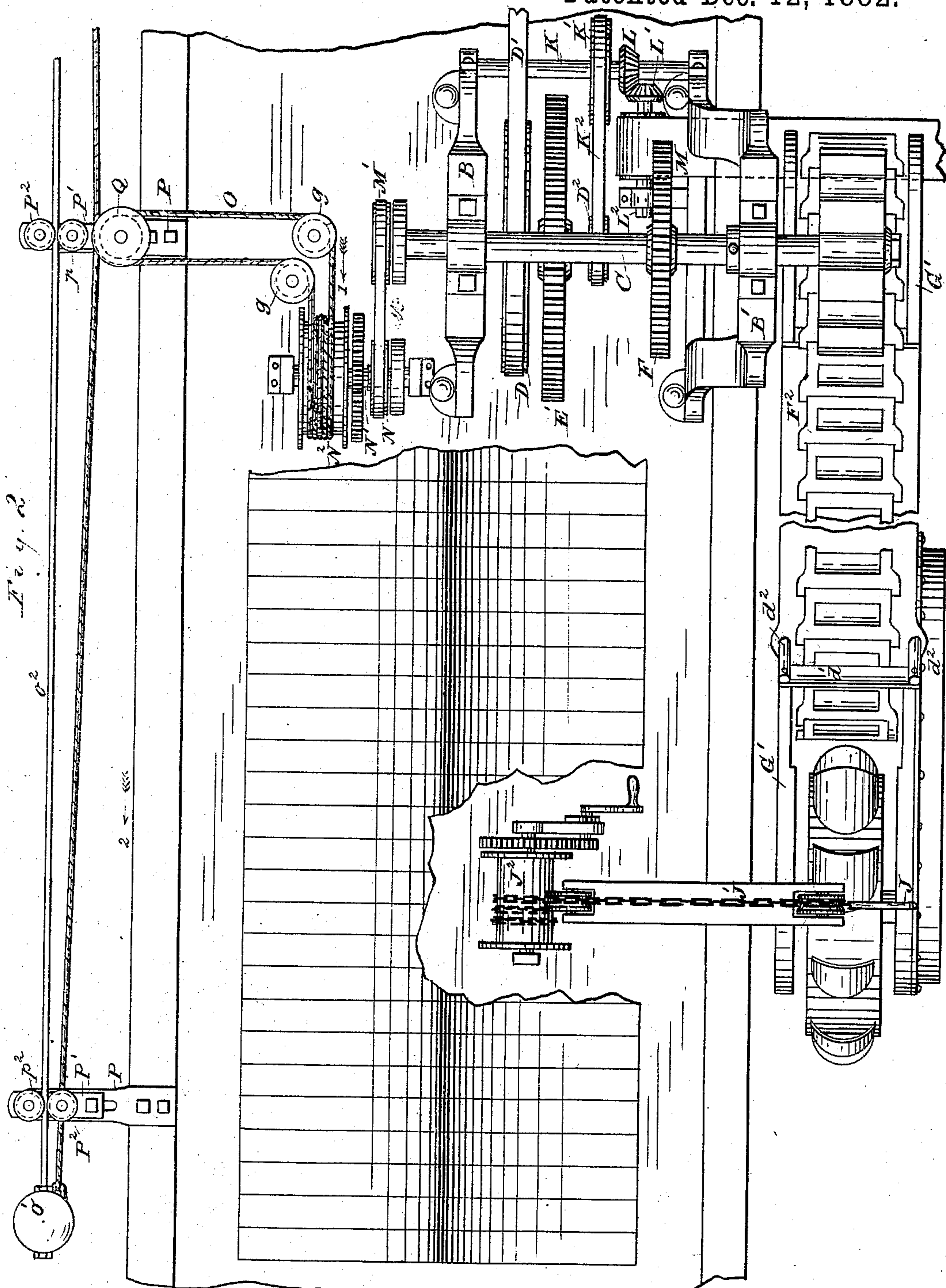
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J. C. ANDERSON.

# METHOD OF AND APPARATUS FOR MAKING BRICK.

No. 268,976.

Patented Dec. 12, 1882.



Witnesses,  
Henry Fausch.  
Lillie E. Anderson.

*Inventor,*

J L Anderson



(No Model.)

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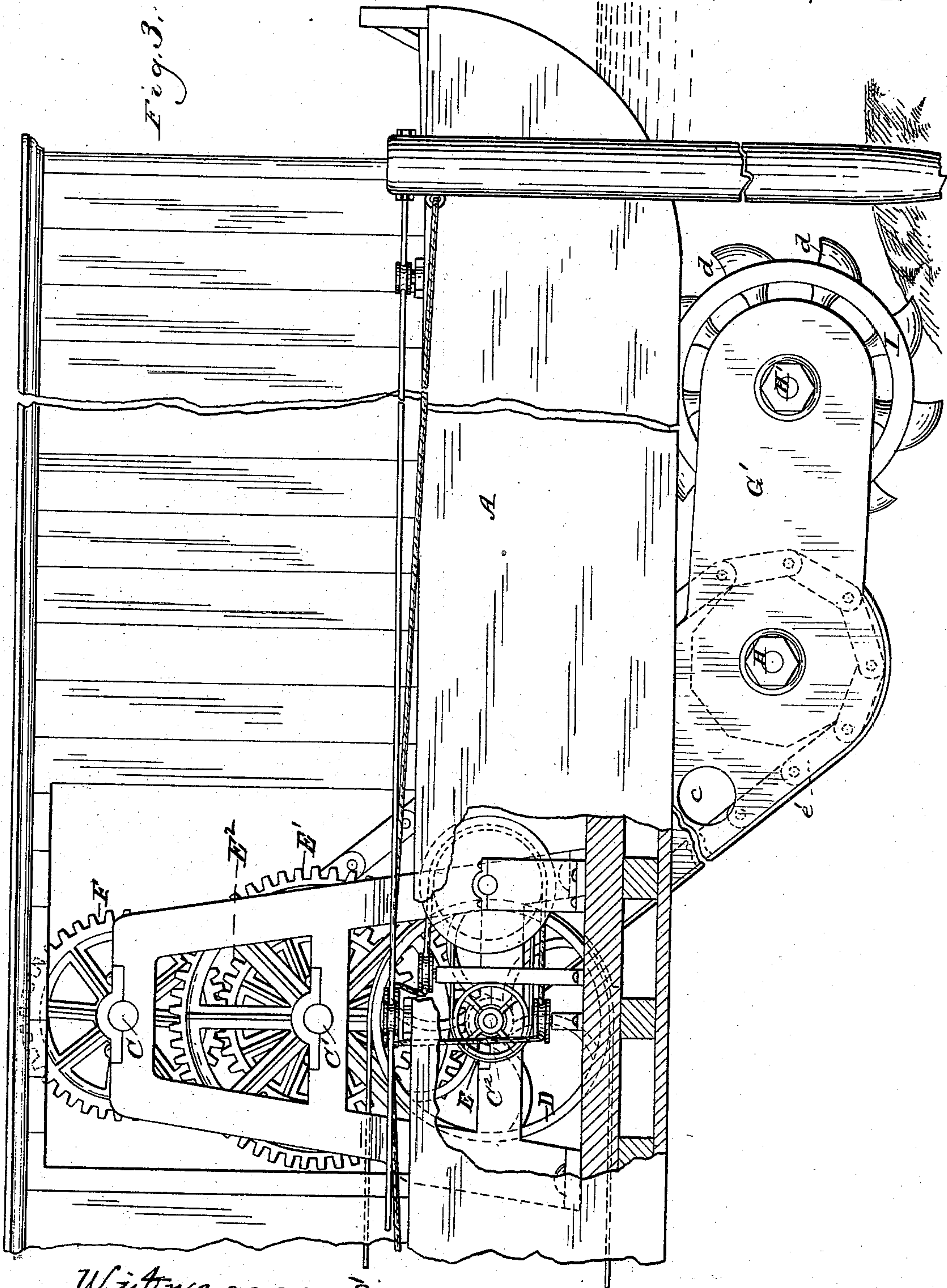
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*Fig. 3.*



Witnesses. A

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(No Model.)

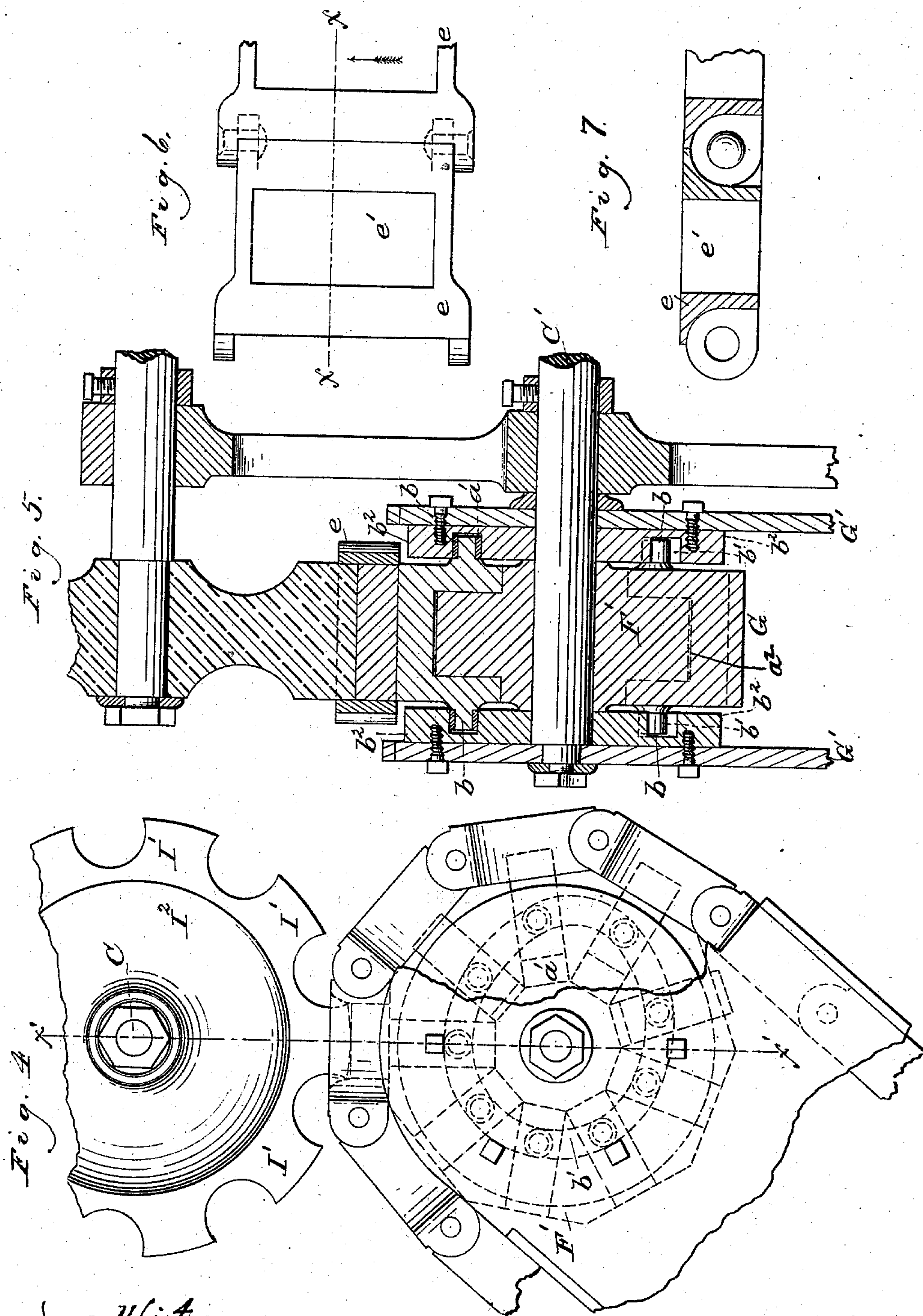
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METHOD OF AND APPARATUS FOR MAKING BRICK.

No. 268,976.

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Witnesses.  
Henry Langfunter.  
Lillian E. Anderson.

Inventor.

J. C. Anderson



# UNITED STATES PATENT OFFICE.

JAMES C. ANDERSON, OF HIGHLAND PARK, ILLINOIS.

## METHOD OF AND APPARATUS FOR MAKING BRICK.

SPECIFICATION forming part of Letters Patent No. 268,976, dated December 12, 1882.

Application filed November 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES C. ANDERSON, a citizen of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Methods of and Apparatus for the Manufacture of Brick; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a method of and apparatus for the manufacture of bricks.

The main object of my invention is to manufacture bricks without the too frequent handling of the clay, which adds much to the cost of the article; and to this end my invention consists in the method of excavating the clay, conducting the clay to the pressing mechanism, pressing the clay into brick form, and conveying the same from the machine in one and the same operation.

My invention consists, further, in the construction and arrangement of the excavating-wheel in such relation to the molds that the same are filled with the clay by the excavating-wheel and conveyed to the pressing mechanism.

My invention consists, further, in mounting the excavating-wheel and mold bearing and carrying apparatus in a rigid frame-work pivotally connected to the main driving and supporting mechanism, so that the excavating-wheel and molds can be raised or lowered without changing their relative position to the pressing mechanism.

My invention consists, further, in mounting the operating parts on a vessel or other portable device, so that the apparatus can be moved forward to the clay bed and receive its supply therefrom.

My invention consists, further, in the construction of the ejecting-plungers and their relative arrangement to the molds, whereby the brick is ejected from the molds while the plunger and mold are both in motion without injury to the brick.

My invention consists, further, in certain details of construction, which will be fully described, and pointed out in the claims.

Figure 1 is a side elevation, partly in section, of my machine as applied to a boat. Fig. 2 is a top or plan view of the same. Fig. 3 is a side elevation, partly in section, showing the working parts. Fig. 4 is a detached view, on a large scale, of the molds and pressing mechanism. Fig. 5 is a sectional view of the molds and pressing mechanism on the line  $x'' x''$  of Fig. 4. Fig. 6 is a top view of a detached portion of the mold-chain. Fig. 7 is a sectional view of the mold-chain on the line  $x x$  of Fig. 6.

Heretofore in making common or what is known as "slop brick" the clay is first dug from the bank or bed and transferred to the tempering or pugging pit, where it is mixed with water and thoroughly kneaded or tempered, after which it is shoveled from the pit and transported to the molding-bench or molding mechanism to be molded into brick, and thence to the drying-yard, and thus frequent handling of the clay is necessary before it is converted into the proper brick form, such frequent handling and shoveling of the clay prior to yarding the brick being the main item of expense in the manufacture of this kind of brick.

In some locations, especially in the bottoms of rivers, stratus or veins of good clay for making the ordinary brick are to be found. Such clay is found in vast quantities in and around the city of Chicago, and much of it is thrown up by the ordinary dredging in deepening and widening the channels of the rivers and other streams, and in the excavations made for building docks, piers, &c. This clay has been utilized to some extent in making brick; but by the process and appliances now in use the clay is excavated and thrown out to the bank or transported to other places to dry, after which it is pugged, tempered, and pressed into bricks, thus necessitating the handling of the clay many times before the bricks are formed or finished.

Referring to the drawings, A designates a vessel of any suitable or desirable construction, on which I mount the operating parts of my machine, as will be described hereinafter in detail.



I do not limit myself to the use of a vessel in the operations of my machine, as it may be applied to a land carriage or vehicle of any suitable or desirable kind.

5 B and B' are brackets or standards secured to the deck of the vessel or other vehicle, in which I mount the necessary mechanism. In the present instance the shafts C, C', and C<sup>2</sup> are secured in suitable bearings in the stand-  
10 ards B B'. The shaft C<sup>2</sup> is provided with a band-pulley, D, over which the driving-belt D' passes, and is connected to the engine or other suitable power, (not shown.) Shaft C<sup>2</sup> is also provided with a band-pulley, D<sup>2</sup>, the office of  
15 which will be presently more fully described. A pinion-wheel, E, is also secured to the shaft C<sup>2</sup>, which meshes with and imparts motion to the shaft C' through the gear-wheel E'. The shaft C' is provided with a pinion-wheel, E<sup>2</sup>,  
20 which meshes with the gear-wheel F on the shaft C and imparts motion thereto. To the shaft C' is also secured the drum for driving the molds, in which are mounted the brick-ejecting plungers, as will be more fully de-  
25 scribed with reference to Figs. 4 and 5.

F' is a drum of octagonal or other form in peripheral outline, to correspond with the links *a* of the mold-chain F<sup>2</sup>, and by which means the mold-chain is caused to travel. The  
30 drum F' is cut away, as at *a'*, to receive and guide the plungers G. The plungers G are recessed, as at *a''*, to receive the cut-away portions *a'* of the drum. The plungers are also provided with studs or projections *b*, which  
35 are confined in cam-grooves *b'* in the plates *b''*, and by which means the plungers are projected outward to expel the brick from the molds, and also retracted, so as to partially form the bottom of the mold when the brick  
40 is being pressed. It will be observed that the molds travel with the same velocity as the pressing points or projections on the wheel I<sup>2</sup>, and that the ejecting-plungers have the same motion, so that when they are brought into  
45 action they press squarely on the brick and free it from the mold without injury thereto.

G' G' are plates of boiler-iron, which constitute the sides of the frame-work for supporting the excavating mechanism and the mold-  
50 chain as well as the driving mechanism. The plates G' G' are pivotally supported by the shaft C', so that the excavating-wheel and mold-chain can be raised or lowered to reach the clay beds of different depths. The side  
55 plates are connected at their upper edges by a plate, G<sup>2</sup>, of boiler-iron, which not only serves to brace the side plates and form a rigid structure, but also serves as a bottom to the open molds to retain the clay therein during  
60 its transit from the excavating-wheel to the pressing mechanism, and as a guard to the molds beneath. The side plates, G' G', are perforated, as shown at *c*, which tends to lighten the structure, and also affords access to the  
65 molds in the interior of the frame-work to facilitate cleaning, repairs, &c.

H and H' are shafts secured in the lower

portion of the frame-work, and both provided with sprocket-wheels *c'* *c''* for receiving the sprocket-chains H<sup>2</sup> for driving the exca-  
70 vating-wheel. The shaft H is also provided with a drum, H<sup>3</sup>, whose peripheral outline corresponds with that of the drum F', and around which the mold-chain passes.

To the shaft H' is secured the excavating-  
75 wheel I, said wheel being provided with a series of scoops or scrapers, *d*, which loosen the clay and throw it forward into the molds, the surplus of clay being removed from the mold by means of a scraper, *d'*, secured to stand-  
80 ards *d''*, mounted in or attached to the side plates, G' G'.

The mold-chain consists of a series of sections, *e*, hinged together in the manner of an  
85 endless chain, and having therein the mold-cavities *e'*. The sections of the molds are made of the same length as the flat portions of the drums F' and H<sup>3</sup>, so that such flat portions in the drums act much in the nature of sprocket-  
90 wheels, and cause the mold-chain to travel around the frame-work G'.

I<sup>2</sup> is a press-wheel secured to the shaft C, and provided with a series of plungers or pressing-points of the proper size and configura-  
95 tion to partially enter the mold-cavities and press the clay therein, and against the ejecting-plunger G and flat portion of the drum F', which act as the bottom of the mold and also as an anvil. The edges of the mold-cavities  
100 are slightly rounded at the top, so as to admit of the free passage of the pressing-points I' therinto. (See dotted lines at *f*, Fig. 1.)

J is a bail secured to the sides G', to which is attached the chain J', which in turn is se-  
105 cured to the drum J<sup>2</sup> of the hoisting mechanism, and by which the excavating-wheel and the lower portion of the frame can be raised and lowered at will.

K is a shaft secured in the standards B B', and provided with a pulley, K', for the re-  
110 ception of the band K<sup>2</sup>, which passes over the pulley D<sup>2</sup> on the main driving-shaft, and thus motion is imparted to the shaft K.

To the shaft K is also secured a bevel-wheel, L, which meshes with a similar wheel, L', on  
115 the shaft L<sup>2</sup>, the office of which is to impart motion to the off-bearing belt M, which conveys the newly-formed brick away from the machine.

I will now proceed to describe the devices  
120 for moving the machine along and feeding it up to the clay stratum.

On the inner end of the shaft C is secured a fast and loose pulley, M', for the reception of the band M<sup>2</sup>, which passes over the pulley N  
125 on the drum-shaft N'. N<sup>2</sup> is the rope-drum, around which the propelling-rope O is wound in such a manner that as the boat is being driven in one direction by winding up one end of the rope the other portion of the rope is be-  
130 ing unwound to admit of the boat moving forward or backward, as is desired. The other ends of the rope or ropes are secured to posts or standards O', firmly secured in the earth at



suitable distances apart, (only one of which is shown,) and are connected by a brace-rod, O<sup>2</sup>, or other suitable device.

P P are brackets secured to the side of the boat, in which are secured adjustable sliding arms P', and in which are mounted the friction-wheels P<sup>2</sup>, which steady and guide the boat, and admit of the boat being set over to one or the other side, so that the excavating-wheel will be brought into contact with a new portion of the clay bed and cut therefrom another slice or kerf.

O is a friction wheel around which the rope passes in opposite directions, and thence over the pulley-wheels g g to the winding-drum N<sup>2</sup>. It will be seen that when the rope O is being wound on the drum in the direction of the arrow 1 the other end of the rope is being unwound and the boat caused to travel in the direction of the arrow 2. It is obvious that by changing the direction of rotation of the drum the boat will be propelled in a reverse direction; but when such reversal of direction is required a clutch mechanism should be used to allow of the working of the propelling mechanism without moving or doing violence to the excavating or molding mechanism.

I will now proceed to describe the operation of the machine.

The posts or columns having been planted or set in their proper position and the propelling mechanism just described set in motion, the excavating-wheel is lowered so as to come in contact with the clay bed, as shown in Fig. 1. The clay is shaved off or loosened and thrown forward in the mold-cavities of the mold-chain, and is conducted upward to the pressing mechanism, where it is pressed compactly in the molds and forms the bricks, after which the bricks are ejected by the plungers G onto the off-carrying belt, by which they are borne to the drying-yard. It will be observed that during the entire operation the clay has been manipulated by machinery, so that all the manual labor required is for the removal of the bricks from the off-bearing belt after they have been finished, and the usual handling in stacking and burning.

The excavating-wheel is constructed of such capacity that a much larger amount of clay is excavated in the first operation than is necessary to fill the molds, and is scraped off, so that frequent working over will result, and the clay will be thus practically tempered in the operation.

The propelling devices which I have described will be found to answer well where the machine is worked near the drying and burning yard; but I do not confine myself to this mode of propulsion, for it is obvious that other means of propulsion may be used—as stern or side wheels or a screw-propeller—and the bricks may be made at a distance from the yard, stacked up on the boat until a load is made, and then be transported to the yard, all of which will be embraced within the scope of my invention.

It is obvious that a separation may take place between the dredging and pressing operation, and in such cases I may also first dredge the clay, and elevate it to the deck of the vessel or into a hopper, and thence to the pressing mechanism; but such a process should be practically continuous, so that the brick can be formed while the clay is water-soaked and moist, as fresh from the bed or in certain kinds of clay a presser-bar or scraper may be all that is necessary to form the ordinary slop-brick. I may also, when my portable device is used upon land, dig and mold the clay in its natural state as it comes direct from the clay beds without being water-soaked, all of which will come within the scope of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The method herein described of making brick, the same consisting in excavating the clay from the clay beds direct into a series of connected molds, and then conveying said molds direct to the pressing mechanism, all in one continuous operation, as set forth, whereby the manual labor of shoveling or handling the clay is obviated.

2. As an improvement in the art of manufacturing brick, the method herein described of mounting the excavating and brick-forming mechanism on a boat or other vehicle, propelling the same into the clay bank or stratum, excavating the clay, and pressing it into bricks or blocks in one and the same operation, as set forth.

3. As an improvement in the art of making brick, the combination of a dredging or excavating machine with a pressing or brick-forming machine constructed on and made part of a boat, vehicle, or other portable structure.

4. As an improvement in the art of making brick, a dredging or excavating device for loosening or digging the clay from the bed, devices for raising the clay from the excavating-machine, and mechanism, substantially such as described, for forming the clay into bricks, all arranged to operate as set forth.

5. In a brick-machine, the combination of a swinging frame, carrying at its outer end an excavating device, with a series or endless chain of molds, and mechanism, substantially such as described, for driving the excavating mechanism and molds, as set forth.

6. In a brick-making machine provided with an excavating device and an endless chain of brick-forming molds, the combination of the drum F', provided with movable plungers, with the pressing wheel or drum I<sup>2</sup>, as set forth.

7. The combination of the endless chain of molds and pressure-wheel I<sup>2</sup>, provided with the pressing-points I' for entering said molds, with the drum F' and brick-ejecting plungers, as set forth.

8. The ejecting-plungers mounted in the drum, as described, in combination with the endless chain or series of molds, whereby the



brick is ejected from the mold while the mold and plunger are both in motion, as set forth.

9. In a brick or other molding machine, a series of molds for containing the material to be pressed, a supporting-drum, and a pressing-wheel the pressing-points of which enter the molds to compact the material.

10. The drum  $F'$ , provided with the ejecting-plungers  $G$ , constructed substantially as described, in combination with the plates  $b^2$ , having formed therein the cam-grooves for the reception of the studs  $b$  of the plungers, whereby the ejecting-plungers are held flush with the face of the drum during the pressing operation and projected forward to expel the brick after the pressing operation, as set forth.

11. The combination of the excavating-wheel and endless chain of molds with the bail  $J$ , chain  $J'$ , and winding-drum  $J^2$ , whereby the excavating-wheel and molds may be raised and lowered, as set forth.

12. The combination of the brackets  $B B'$ ,

securely fastened in position with the driving-shafts  $C C' C^2$ , with their connected mechanism, with the excavating, carrying, and pressing mechanism, as set forth.

13. The combination of a dredging and brick-making machine with a propelling device substantially such as described, whereby the machine is steadied to its work and a uniform cut or kerf is given to the brick-making mechanism, as set forth.

14. The combination of the shaft  $C'$ , provided with the drum  $F'$ , the frame  $G'$ , provided with the drum  $H^3$ , the endless chain of molds, sprocket-wheels  $c' c^2$ , and sprocket-chain  $H^2$ , with the excavating-wheel  $I$ , as set forth.

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

J. C. ANDERSON.

Witnesses:

LILLIE E. ANDERSON,  
JAS. COMPTON.