

(No Model.)

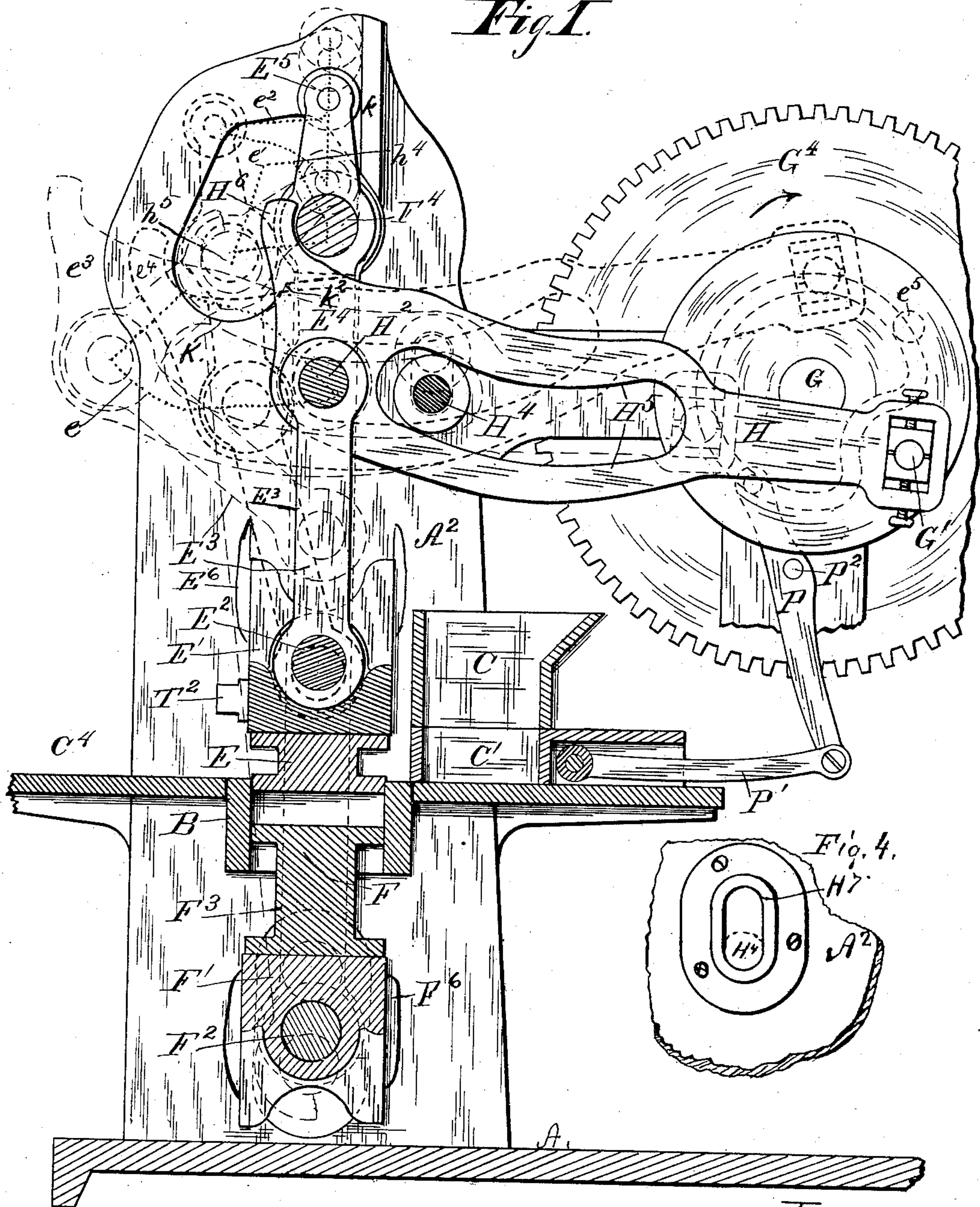
2 Sheets—Sheet 1.

A. D. THOMAS.
BRICK MACHINE.

No. 375,660.

Patented Dec. 27, 1887.

Fig. 1.



Attest:

W. D. Harrington.
[Signature]

Inventor.
Albert D. Thomas,
By Samuel J. Wallace,
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

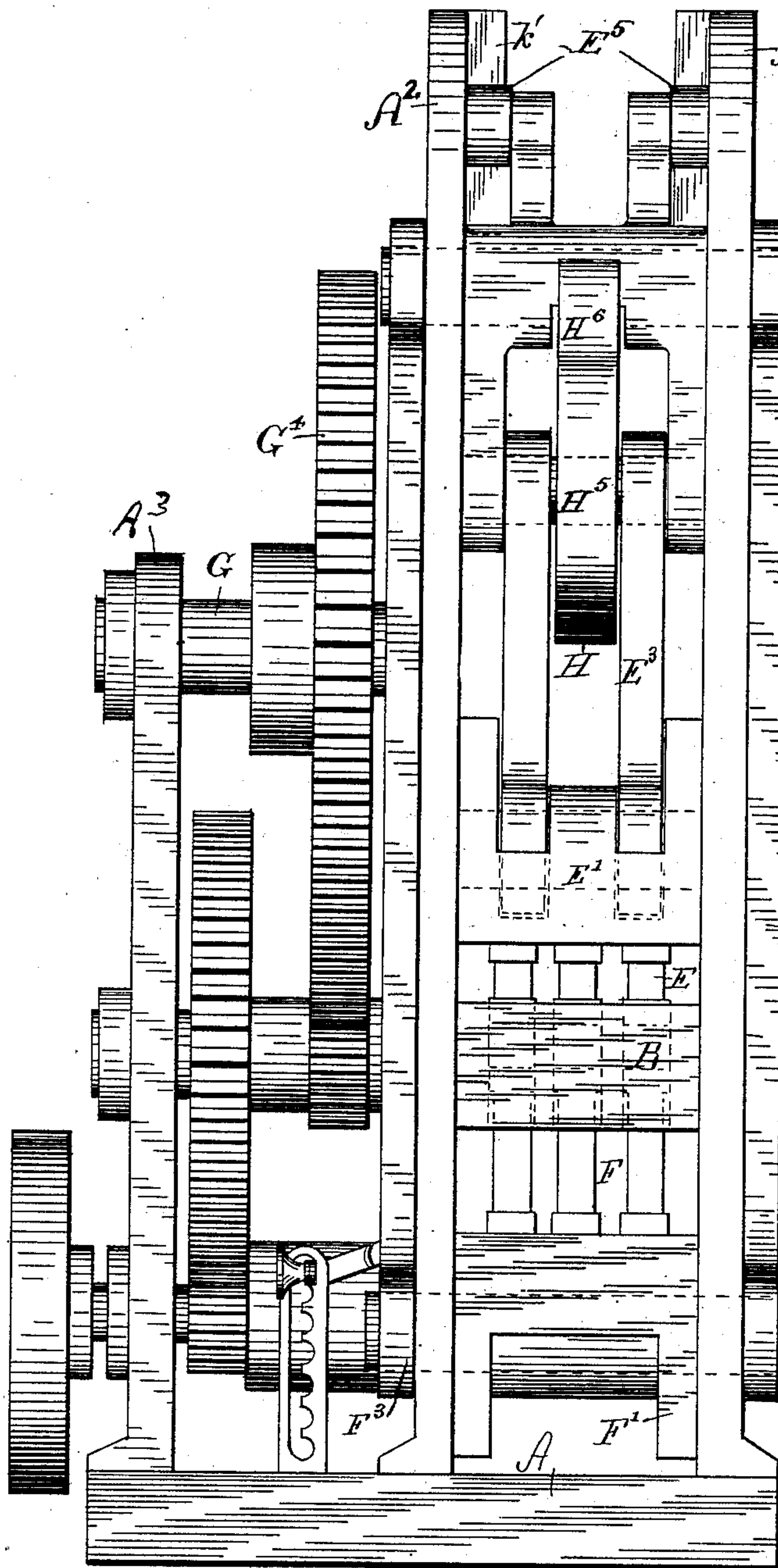
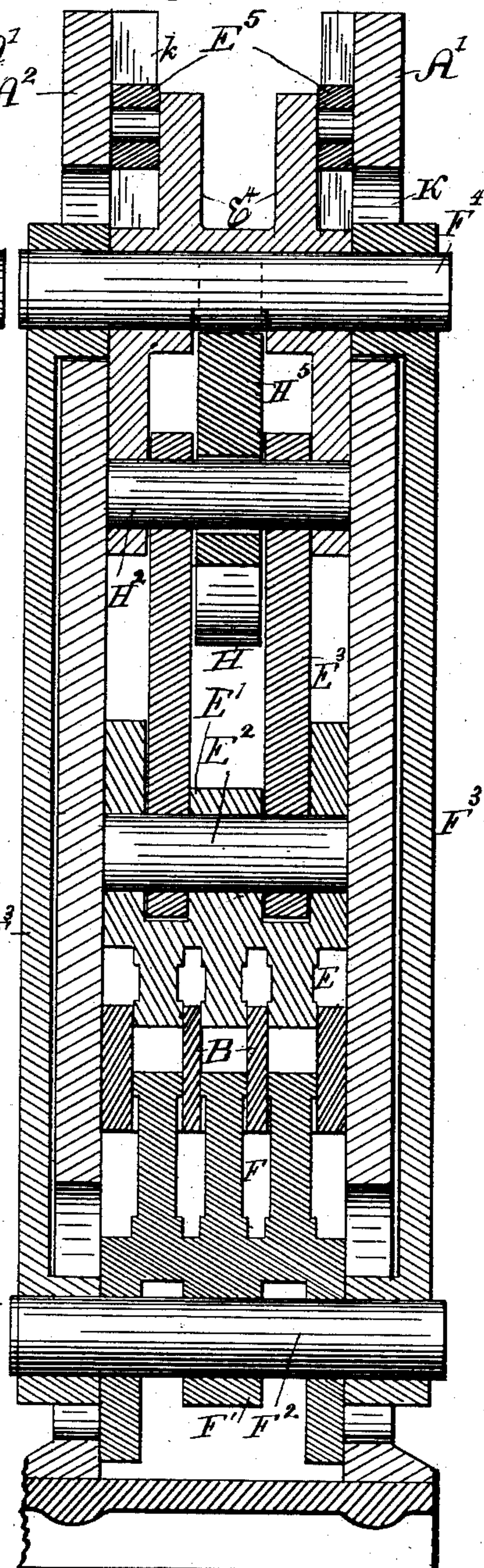


Fig. 3.



Attest:
W. D. Harrington,
J. H. H. H.

Inventor,
Albert D. Thomas,
By Saml. J. Wallace,
Attorney.

UNITED STATES PATENT OFFICE.

ALBERT D. THOMAS, OF KEOKUK, IOWA.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 375,660, dated December 27, 1887.

Application filed June 20, 1886. Serial No. 206,573. (No model.)

To all whom it may concern:

Be it known that I, ALBERT D. THOMAS, of Keokuk, in the county of Lee and State of Iowa, a citizen of the United States, have invented a new and useful Improvement in Brick-Machines, which is made and used substantially as set forth hereinafter, and as shown in the accompanying drawings, in which—

Figure 1 is a vertical section of the machine. Fig. 2 is a front view of same. Fig. 3 is a section of part of same, looking from front. Fig. 4 is a detail of part H¹.

This invention relates to machines for making brick from pulverized clay by great pressure in molds; and the invention consists in various new and improved features made substantially as shown and set forth.

The machine resembles that of my patent of April 14, 1885, No. 315,855, to which I refer for additional particulars, referring to corresponding parts by corresponding letters of reference.

The brick are made in molds in mold-block B, in which upper and lower opposed plungers, E F, compress the clay between them. These plungers are held by plunger-heads E' F', which move up and down in guideways E⁶ F⁶ on side frames, A' A², by pitman-like link-bars E³ F³, held by pivot-pins E² F². The lower plungers, F, are moved by link-bars F³ from pivot-pin F⁴, and the upper plungers, E, by link-bars E³ from pivot-pin H², connected with pivot-pin F⁴ by link-bars E⁴, forming levers.

The pitman H is carried by driver G through crank-pin G', on which the pitman has upward and downward adjustments, so as to give it a peculiar combined series of actions, as a pitman and as a lever, to operate the opposed plungers, which are connected with it through pivot-pin H² and projection H⁶ on its end. The pitman H has in it a slotted guideway, H⁵, by which it engages with and moves in its circuit as a pitman over a pivot-pin, H⁴, having a friction-roller thereon, on which it turns as a lever to give peculiar motions to its free end in different parts of its movement to push down and draw up the opposed plungers.

The pivot-pin H⁴ is held at its ends by guides H⁷, which are held by side frames, A' A², on which they are adjustable. These

guideways are arranged to give the pin H⁴ a certain latitude of up-and-down motion as carried by the pitman-lever H. This latitude of motion and the form of guideway H⁵ are arranged and adjusted to produce the exact amounts and kinds of motion desired in the opposed plungers at the exact times required by each to produce a system of actions to open the molds to receive clay, to close the opposing plungers on the clay in the molds, to compress the clay with great force between them to compact it into brick, to push the brick out of the molds and relieve them of pressure, and to open the molds again in the circuit of the crank G'.

The link-bars E⁴ project as levers above pivot-pin F⁴ and bear guide-rollers E⁵, which travel on vertical guideways k on the side frames, A' A², during a portion of the series of operations, and the end of pitman-lever H projects up as a hooked bearing, H⁶, to engage with the pivot-pin F⁴ during a portion of this period, so as to draw and hold the rollers E⁵ back against their guideways. This hook and guideway are arranged so as to assist the peculiar motion of the pitman-lever and the series of parts connected by pivot-pins E², F², H², and F⁴ to produce the actions of the upper and lower opposed plungers which are desired in the several parts of the process of making the brick.

The parts are connected and arranged so the movement of the crank G' will carry the pitman-lever H and its several connected parts into the positions illustrated by full lines in the several figures at the point of greatest pressure on the brick and into the positions illustrated by the two series of differently-dotted lines in Fig. 1 at the point of pushing the brick out of the molds and of opening the molds to receive clay. In this circuit of motions the center of pivot-pin H² describes approximately the course shown by finely-dotted lines e, that of pin F⁴ that of lines e', and that of pin E⁵ that of lines e², first upward to its highest position, then down to its lowest, then upward and forward in a curved line to its forward position, then back, and then upward again. In this series of movements certain portions of the course of the parts are controlled by guide-camways K on side frames, A' A², so as to hold the pivot-

pin F^4 in its required circuit, and other portions by guideways k . When the parts are in the positions shown in full lines in Fig. 1, the clay is held between the opposed plungers nearly at the bottom of the molds in its highest state of compression, forming solid brick, and all the pivot-joints of the parts holding the opposed plungers together thereon are in one straight vertical line, so that the parts have their full tensile and compressive strength and mechanical advantages for carrying the compression to its highest point. From this position the pitman H moves the parts, being carried by the driving crank G' in its downward course, so that it turns as a lever on pivot H , having its short end and greatest power to lift them thereby to start the brick upward in the molds. The pitman then moves forward as well as downward in its course, and lifts the brick out of the molds partly by its lever action and partly by its pitman action, pushing lever E^4 upward, so as to lift the lower plungers by a nearly-vertical lift on the link-bars F^3 . To produce this result, the shape of slotway H^5 causes the end of the lever to rise as it begins to move forward, and the turning of lever E^4 lets it move forward, while pivot F^4 is moved very little forward, but upward. This action slowly releases the pressure on top of the brick and lifts the top plunger from it by the motion of the pivot H^2 , being forward and upward faster than pivot F^4 , so that by the time the brick is discharged the upper plunger is some distance above it. In this the pivot F^4 is brought to its highest point, h^4 , with a slightly forward sweep, while held back and true by hook H^6 and held forward by the upper ends of levers E^4 , being held by guideways k behind. The up motion of the top plungers is checked by a slide-loop over pin T^2 , having the arrangement and bottom connection set forth in my patent referred to. The brick having been lifted out of the molds and held level with the table in front, and the plungers lifted to their highest position by the forward motion of the pitman and crank G' , the parts move slowly from the lever, action having ceased. A camway in the disk of shaft G then rapidly moves lever P and filler-box C' with a charge of clay from hopper C forward, so as to shove the brick into the table in front and bring the clay over the molds. The pitman then begins to act as a lever again by the upward motion of crank G' while it is thrust forward, and the lower plungers are forced rapidly down from the action of the tie formed by the loop on pin T^2 , which prevents the upper plungers rising higher, so that link E^3 is forced to sweep with its top end in a downward circle, which, in turn, with the downward motion of the pitman-lever and its forward motion, forces the parts into the position shown in the first series of dotted lines e^3 , Fig. 1, with the plungers at their respective highest and lowest points and the molds open to receive a fresh charge of clay, which falls

into them from the filler-box C' , held over them therefor.

The amount of clay to make the brick is controlled by a pivoted lever under the bottom plungers on bed A , as shown in the patent referred to. The position of this lever is adjusted by a set screw in its free end. The plunger-head descends onto this lever in whatever position it is set and opens the molds just so far. The clay from the filler-box falls in so as to fill the molds as far as they are open with a definite measured quantity of clay, and the remainder is cut off and carried back by the filler-box. The bulk of clay to make the desired solidity of brick has to be varied to suit the kind and condition of the clay, as well as the degree of hardness desired. When the molds are filled, the lever P pulls back the filler-box, and the fall of the plungers F strikes the adjustment-lever referred to, causing a shock to be communicated to the upper plungers, as set forth in said patent, so as to start them if disposed to stick fast in the molds from any cause. This action brings the center of pivot F^4 to its lowest point, h^5 , and its shaft against a shoulder, k^2 , in the side frame, and resting in a downward recess, therein. The plungers remain stationary a moment, while the clay falls and the filler-box is returned to its position under the hopper to receive a new charge of clay, and while the lever H is turned to its farthest position by the rising crank G' . This is provided for by the rise of the pivot H^4 in its slotway, as well as by the shape of the back part of slotway H^5 therefor in lever H . When the pivot H^4 has reached its highest point and the crank G' begins to move backward, the pitman H is drawn back, while its forward end is held down by the pivot, so as to force the upper plungers rapidly down to the clay in the molds and onto the clay until it has been heavily compressed without moving the lower plungers. The lower plungers are held stationary during this action by the engagement of a bearing on the shaft of pivot F^4 with a seat therefor in the side frames, $A' A^2$, which holds it until this shaft is turned by lever E^4 , in which it is held solid, so that it will pass its holding bearing. While held in this way the full force of the machine is concentrated on the upper plungers to force them down. When the upper plungers have reached their lowest point and the bearing on shaft F^4 has turned to the point of its holder k^2 , and the pitman is carried to a point, e^5 , where its hook H^6 engages with this shaft, so as to lift it over and free from its holder, the pivots E^2 , H^2 , and F^4 , holding the upper plungers, are brought into a straight line into the positions shown by the second series of dotted lines, e^4 , Fig. 1, and the pressure on the brick is raised nearly to its highest point. Then the crank draws back the parts without changing their relative positions, except that the link-bars $E^3 F^3$ swing on their lower pivots, $E^2 F^2$, until it has reached its

farthest back position and has drawn the parts back so as to bring the pivots F^4 H^2 and the parts E^3 , F^3 , and E^4 holding them into one straight line with the pivots E^2 F^2 and the plungers and plunger-heads E E' F F' , so as to produce the highest pressure on the brick, at which it holds them nearly stationary while it moves down so far as to bring the pivot H^4 again to its lowest point, giving time for the pressure on the brick to give the clay a permanent set and bringing the parts into the positions shown in full lines in Fig. 1 again. In this action the relative motion of the plungers is relatively free, but principally consists in lifting the lower, so as to compress the brick equally below.

Several of the parts not specially shown or described herein are made in the manner set forth in my patent referred to, and several features of operation are more particularly set forth therein. Various modifications may be made.

I claim—

1. The pitman H , borne by crank G' , provided with and bearing a guideway, H^5 , combined with a fulcrum-bearing, H^4 , therefor, on which it is adapted to change its point of leverage in relation to its end bearings while moving, and with two opposed plungers connected with the pitman for operation by its lever action.

2. The pitman-lever H , borne by crank G' , bearing a slot-guideway, H^5 , combined with a fulcrum-pivot, H^4 , therein, and with two opposed moving plungers connected with it by link-bars and pivots and adapted to be operated by the pitman-lever action through them.

3. Two opposed plungers, combined and connected by link-bars with a pitman, H , having a fulcrum upon which it is arranged to act as a lever as it moves and having a lever-hook point, H^6 , substantially as and for the purpose set forth.

4. The pitman H , borne by crank G' , combined with pivot H^4 , forming a fulcrum for the pitman as that moves along over it, causing the pitman to act as a lever as it moves, and with an upper plunger, E , connected with it by link-bar and pivots adapted to push the plunger down as the pitman operates in one part of its course.

5. The pitman H , combined with two opposed plungers connected with it through one pivot-pin, H^2 , for operation by it, and with a fulcrum-bearing, H^4 , arranged to govern the motion of the pitman and the plungers.

6. The pitman H , having one end connected to and carried around by the crank G' and provided with one pivot-pin, H^2 , at the other

end, and a fulcrum-bearing, H^4 , upon which it is adapted to act as carried by said crank, combined with two opposed plungers, E F , connected therewith by link-bars E^3 , E^4 , and F^3 through said pivot-pin, and arranged to be operated from said crank, and the pitman action therefrom modified by lever action on said fulcrum.

7. The pitman H , combined with lever E^4 and guideway k , and with link-bars F^3 and a lower plunger connected through them and adapted to be operated by the pitman.

8. The two opposed plungers E F , having guideway-seats, combined and connected by link-bars and pivots with pitman H , carried by a driving-crank, G' , and having a fulcrum-bearing, H^4 , and a connecting-pin, H^2 , the said pin being arranged to be located in one straight line with the connecting-pivots in said plungers at the point of greatest pressure upon them, substantially as set forth.

9. The pitman H , borne by crank G' and having a fulcrum to control its motion, combined with lever E^4 , pivoted to it and to plunger-link F^3 and plunger link E^3 , substantially as set forth.

10. The pitman H , combined with controlling-pivot H^4 and operating-pivot H^2 , bars F^3 and E^4 , guideway k , and plunger F , adapted to be operated by the pitman.

11. The combination of pitman H , borne by crank G' , with a fulcrum, H^4 , on which it is adapted to move and act as a lever, and with two opposed pressing-plungers, E F , connected with it for operation by link-bars and pivots.

12. The pitman-lever H , borne by crank G' , having guide-slotway H^5 , combined with pivot-pin H^4 , and with upper and lower brick-mold plungers and their connecting bars and joints, substantially as and for the purpose set forth.

13. In a brick-machine, a pitman, H , having a crank-bearing at one end, a pivot-pin, H^2 , at the other, and a fulcrum-bearing way, H^5 , between them, with a curved guide-line arranged to give special lever action to the pitman by moving upon a fulcrum, substantially as set forth.

14. In a brick-machine, the pitman H , having a crank-bearing at one end, a pivot-pin, H^2 , and a lever-hook point, H^6 , at the other end, and a fulcrum-bearing between, arranged to give special lever action to the pitman as carried by the crank.

ALBERT D. THOMAS.

Witnesses:

DAVID G. ANDERSON,
JOHN P. GRIFFITH.