

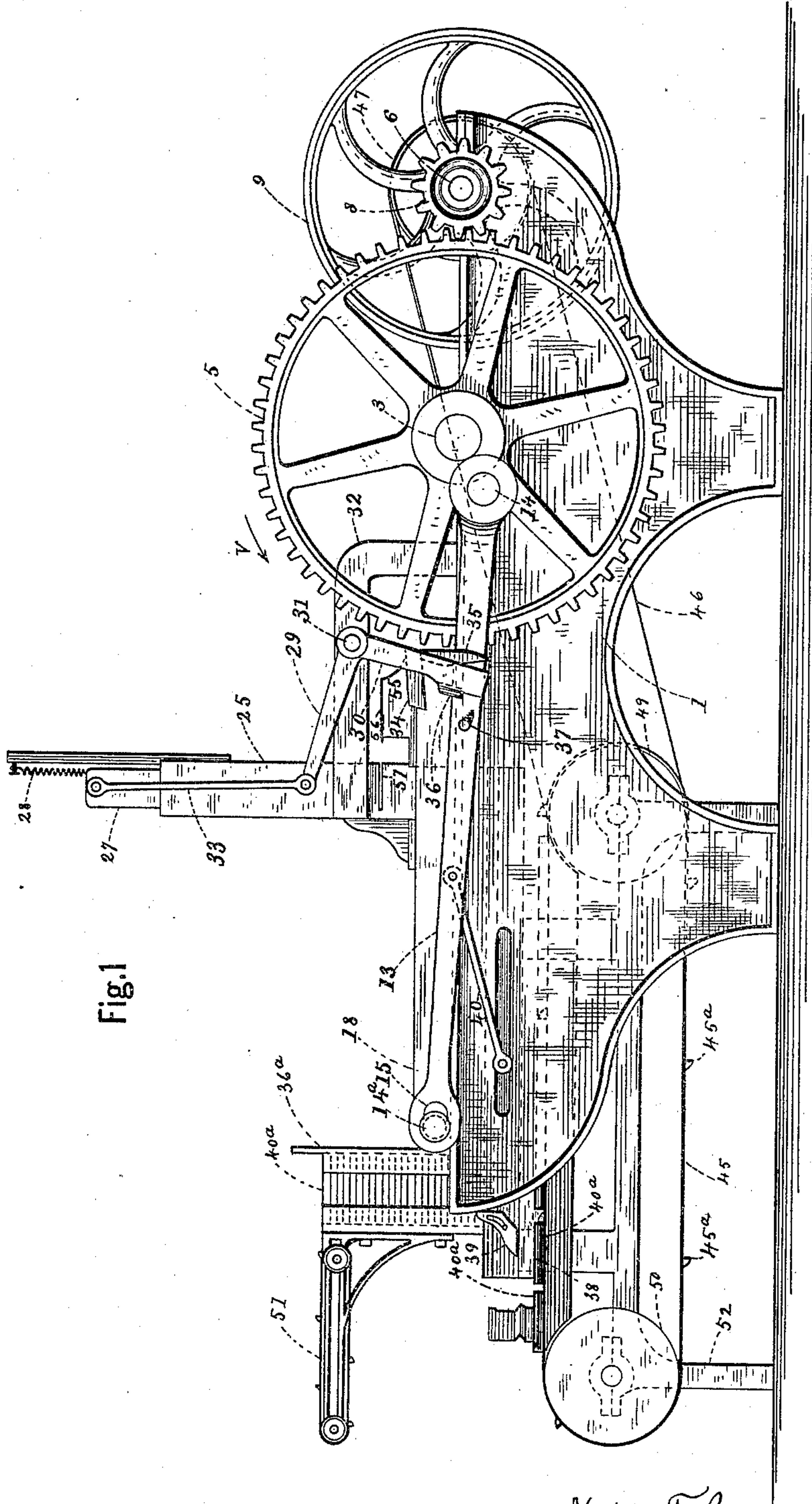
(No Model.)

3 Sheets—Sheet 1.

N. T. BARNES.
BRICK MACHINE.

No. 466,763.

Patented Jan. 12, 1892.



Witnesses.
J. M. Caldwell.
Joseph H. Whittington.

Noble T. Barnes Inventor.
By James Sangster
Attorney.

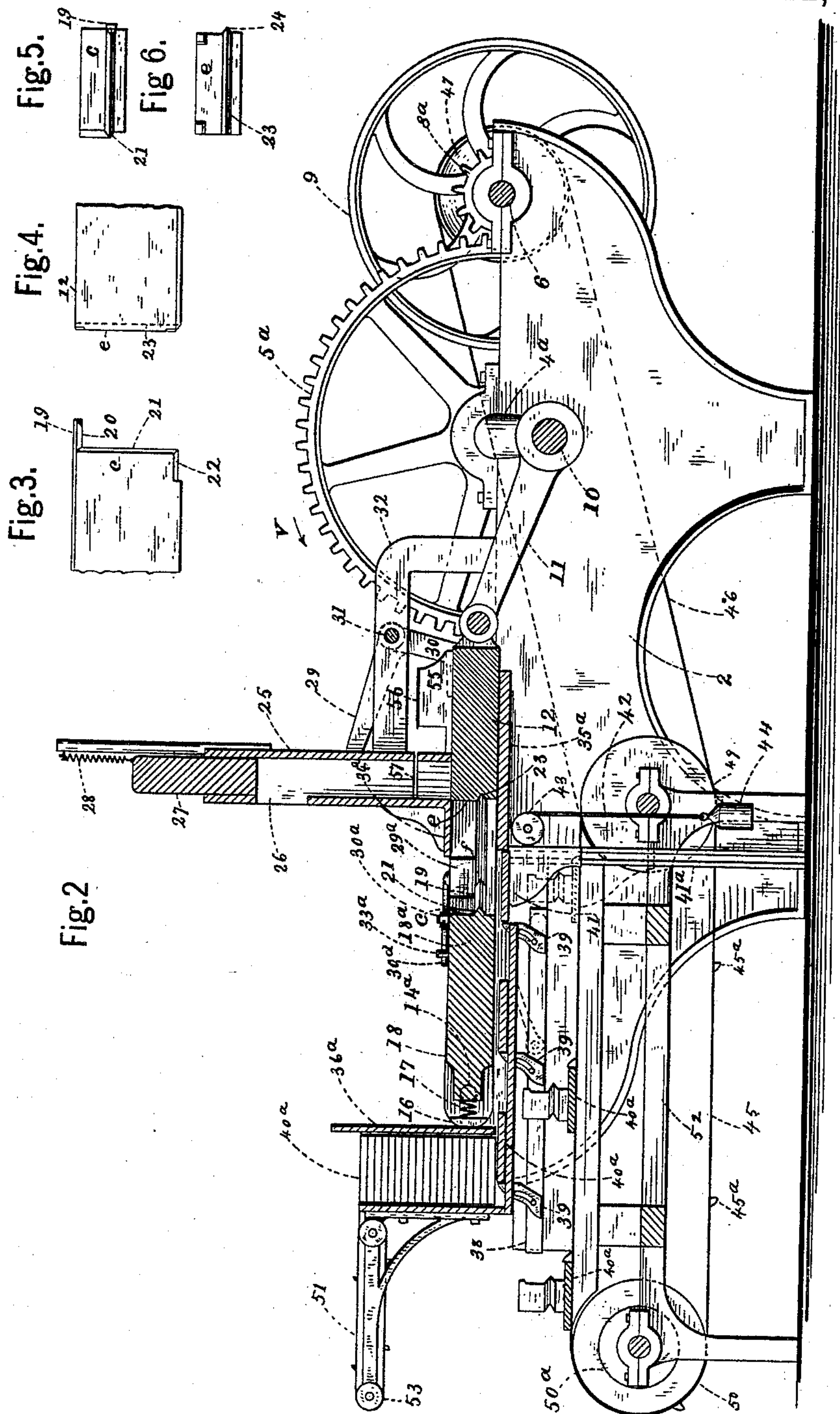
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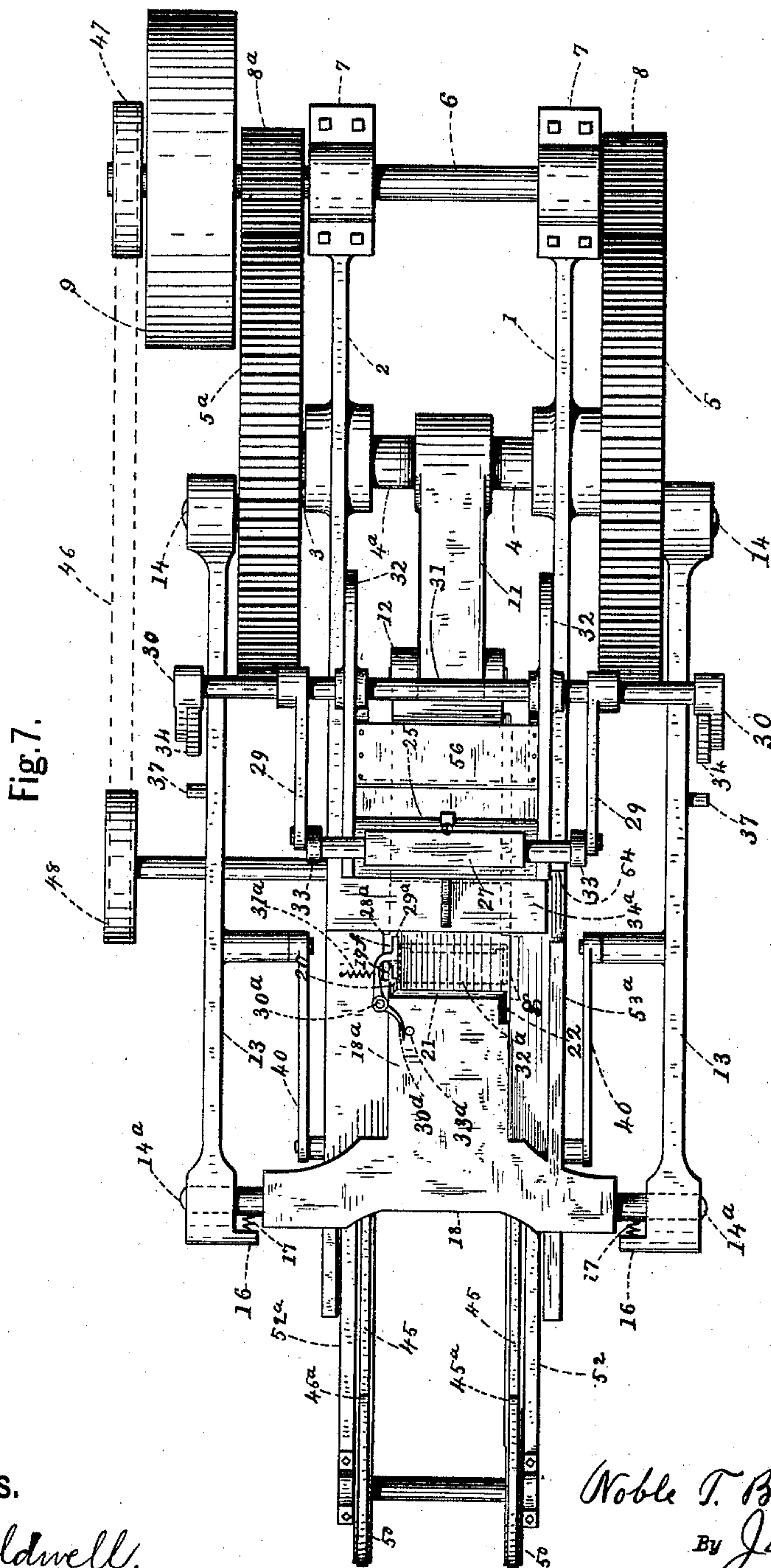
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UNITED STATES PATENT OFFICE.

NOBLE T. BARNES, OF BUFFALO, NEW YORK.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 466,763, dated January 12, 1892.

Application filed March 16, 1891. Serial No. 385,236. (No model.)

To all whom it may concern:

Be it known that I, NOBLE T. BARNES, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Machines for Making Paving-Blocks, of which the following is a specification.

My invention consists in certain improvements in machines for making that kind of paving or other blocks which are provided with ribs or projecting portions on one side and end of the block and corresponding depressions on the opposite side and end, all of which will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine complete. Fig. 2 is a vertical longitudinal sectional elevation. Fig. 3 is a detached top view of a portion of the front pressing-piston. Fig. 4 is a detached top view of a portion of the rear pressing-piston. Fig. 5 is a detached face view of the front pressing-piston. Fig. 6 is a detached view of the rear pressing-piston. Fig. 7 is a top plan view, the conveyer for carrying the boards back to the machine and box for receiving them being omitted, so as to show the machinery below.

The frame of the machine consists of two side pieces 1 and 2, and is secured together by the usual binding-bolts, and is preferably made of cast-iron as the most suitable material. The crank-shaft 3 is mounted in bearings in the frame and is of wrought-iron, steel, or other suitable material. It is provided with a double crank 4 4^a. (See Figs. 2 and 7.)

On the ends of the crank-shaft, at opposite sides of the machine, are rigidly secured by keys or in any well-known way the two large spur gear-wheels 5 and 5^a. The driving-shaft 6 is also mounted on the frame in boxes 7, and is provided with two pinions 8 and 8^a, rigidly secured thereto in any well-known way, which gear in with the spur-gear 5 and 5^a. It is also provided with a driving-pulley 9, by which the machine is driven by a belt connected with any suitable source of power.

To the double-crank pin 10 (see Fig. 2) is jointed a heavy connecting-bar 11, having its opposite end jointed to the back end of the rear pressing-piston 12. (See Figs. 2 and 7.)

On the outer side of each of the spur-wheels 5 and 5^a is a connecting-rod 13, each mounted so as to turn easily on the pins 14. The opposite end of each of the connecting-rods 13 is provided with an elongated opening 15 to receive the pins 14^a and allow the connecting-rod a short longitudinal movement thereon, as well as a turning movement. On the inner side of each of these connecting-rod ends is an inwardly-projecting piece 16, (shown in Fig. 7; also Fig. 2,) and between each portion 16 and the shank of the pins 14^a is a short spiral spring 17. The object of these springs 17 is to allow for the difference between the movement of the crank-pin 10, which moves the rear piston by its connecting-bar 11, and the pin 14, which operates the front piston through the connecting-rods 13, the crank-pin 10 being set at about sixty degrees in advance of the connecting-rod pins 14. The pins 14^a are rigidly secured to opposite sides of the cross-head 18, which forms a part of or is connected with the front pressing-piston 18^a. At one end of the face of the front pressing-piston 18^a is a forwardly-projecting portion 19, (see Figs. 3 and 7,) having a V-shaped inwardly-projecting portion 20, which forms the V-shaped groove in the end of the paving-block when formed in the mold. Horizontally along the face of the pressing-piston is another V-shaped projecting rib 21, which starts on a level with the projecting portion 20 and extends along the face of the block, as shown in Fig. 5, and then around and horizontally along the side of the piston, as shown in Fig. 3, thereby forming the projecting portion 22, which projection moves in a corresponding groove in the side of the mold when it is being closed up to the size of a block. The object of the horizontal rib or projecting portion 20 is to produce a V-shaped groove along one face of the block when formed in the mold. The face of the rear piston is provided with a groove 23. (See Fig. 6.) This groove, when the block is formed, leaves a horizontal rib on the opposite face. Along one side of the rear piston is also a V-shaped projecting rib 24, which slides in a corresponding groove in the side of the mold-box.

At the top of the machine is a vertical rectangular tube 25, having an opening 26 in front, and in the top of the tube is a vertical

piston 27. This piston 27 is kept in its upward position by a spring 28 when released from the mechanism that draws it downward. The clay is forced in through the opening 26 by means of a pug-mill or any well-known means. The piston 27 receives its proper vertical movements to force the clay down into the mold by means of the arms 29 and 30, which are rigidly secured to a shaft 31, mounted in bearings in the supporting-frame portions 32, and the connecting-rods 33, one at each side of the machine, having their lower ends pivoted to the arms 29 and their upper ends to the piston 27. At the lower swinging ends of the arms 30 are inwardly-projecting cam-pieces 34, 35, and 36, and on each of the connecting-rods 13 (see Figs. 1 and 7) is a pin 37 projecting outward.

From the above construction it will be seen that as the spur-wheels 5 and 5^a, as they turn in the direction of the arrow V, (see Fig. 1,) will cause the pins 37 to move practically in the curve of an ellipse, and in this movement they will first strike the cam-pieces 35, and in their backward and upward course will move the lower ends of the arms 30 backward and outer ends of the arms 29 downward, and through the connecting-rods 33 the piston 27 receives its downward movement at the proper time, and as the pins 37 leave the cam-way the springs are free to act and raise the piston up again.

The paving-block which this machine is designed to make is the same as that for which an application for a patent is now pending in the United States Patent Office, filed February 28, 1891, Serial No. 383,254; but it may be adapted to make any paving-block either with any form of projections or without projections; but it is more especially designed for making paving-blocks substantially as above described.

The mold in which the paving-block is made is illustrated in Figs. 2 and 3, and consists of the front and rear piston-faces, which make the two opposite faces of the block, the front face being designated by the letter *c* and rear face by the letter *e*, (see Figs. 2, 3, 4, 5, 6, and 7,) and the end sides of the mold are designated by the letters *f* and *g*. (Shown in Fig. 7.) The face *c* is provided with the V-shaped rib 21, which makes the horizontal groove extending along that face of the block, and the opposite face *e* is provided with the horizontal groove 23, which produces the V-shaped projection on the block. One side of the front piston is provided with the forwardly-projecting portion 19 and 20, the back part of which slides in the shallow groove near *f* until it reaches the end of the groove, where the mold is closed to form a block. The V-shaped portion 20 forms the groove across the end of block. The V-shaped groove in the opposite part *g* of the mold produces a V-shaped rib, which projects from the opposite end of the block. At one side of the mold is an opening

or recess 28^a, (shown in Fig. 7,) in which is located a movable plate 29^a, rigidly secured to an arm 30^d, pivoted by a pin 30^a to the mold-plate. (See Figs. 2 and 7.) This plate 29^a is kept to its place in the recess 28^a by a spring 31^a. (Shown in Fig. 7.) The object of this device is to provide the means for removing the block from the portion 20, which forms a deep groove in the end of it, by pushing the block to one side so that it can be dropped down out of the mold, as will be described hereinafter, (see Fig. 7,) where a block is designated by the dotted lines 32^a, showing it moved to one side, so as to free it from the portion 20, the mold being made wider at that point to permit it. This side movement of the block is produced by the movement of the plate 29^a. This movement is produced by a pin 33^a on the piston, which strikes against the arm 30^d as the piston is moving away from the block after being formed, substantially as shown in said Fig. 7. After the block is removed and the piston advances forward to press another, the pin 33^a passes away from said arm and allows the spring 31^a to act and bring the plate 29^a into the recess 28^a, thereby leaving the mold in position to mold another block.

In Figs. 2 and 7, 34^a and 35^a designate the plates forming the top and bottom of the mold and between which the block is formed. The boards upon which the blocks are deposited to be taken from the machine are put into a box 36^a, (see Fig. 2,) having an opening on the rear side at the bottom large enough to permit a board 40^a to pass under it, but prevent the others above it from moving at the same time. At each side of the machine below the boards is a horizontal bar 38, mounted on slideways and provided with a series of pivoted pawls 39. These sliding bars and their pawls receive a reciprocating movement back and forth by means of connecting-rods 40, pivoted to the sliding bars at one end and having the opposite end pivoted to the connecting-rod 13. From the above description it will be seen that the movement of the connecting-rods 13 will impart a reciprocating movement to the connecting-rods 40 and pawls and bars connected therewith, and that the pawls 39 will tip over and pass under the boards 40^a in their backward movement and raise up in their forward movement and carry the boards with them. (See Figs. 1 and 7.)

The means for removing the block from the mold consists of a counterweighted platform 41, upon which the boards 40^a are moved. It is kept in its upward position by a cord or cable 42, which passes from the platform over a friction-roller 43 and then downward, where it is provided with a counter-weight 44, which keeps it in its upward position until the weight of a block is placed upon it, when it descends with the block and is deposited upon the endless carrier 45, by which it is carried off from the machine, as

will be readily understood by reference to said drawings. The platform 41 moves in vertical slideways 41^a.

The endless carrier receives its motion by means of a belt 46, running from a pulley 47 on the driving-shaft and connecting with a pulley 48 (shown in Fig. 7) on one of the endless-carrier shafts, which carries two of the pulleys upon which the endless-carrier belts 45 run. The endless-carrier belts run on the pulleys 49 and 50. These belts 45 are provided with projecting pieces 45^a to catch and carry the boards along. The endless-carrier pulleys 49 and 50 are mounted in bearings on the frame 52 and 52^a.

If desired, a conveyer or endless carrier 51 may be attached to the front of the box 36^a to carry the boards back again to said box. It consists of an endless belt mounted on pulleys in a suitable frame and provided with projecting catches to receive the boards, and may receive its proper movement by a cross-belt running from a pulley 53 to a pulley 50^a, (see Fig. 2,) or from any suitable part of the machine.

On the top mold-plate 34^a and on the cross-head 18 are projecting portions 53^a and 54, which act as stops to limit the size of the mold when the pistons come together to mold a block. (See Fig. 7.) Secured to the rear piston 12 are two supporting-pieces 55, upon which is mounted a thin sheet-metal cutter 56 for cutting off enough clay to form a block. It receives its proper forward movement from the motion of the piston and passes in through the opening 57 in the tube or box 25. (See Figs. 1 and 2.)

I claim as my invention—

1. In a machine for making paving-blocks having projections from the sides and ends, the combination of two pressing-pistons, a means, substantially as above described, for giving them a longitudinal movement to and from each other, a movable plate provided with an arm pivoted to the machine at one end of the mold, and a pin for moving the plate forward as the pistons move from the block, whereby the block receives an endwise movement, substantially as and for the purposes described.

2. In a machine for making paving-blocks, the combination of two pressing-pistons, connecting-rods for connecting the front piston with cranks at each side of the machine, a con-

necting-bar connecting with the rear piston, 55 having its opposite end connected with a crank-pin set at sixty degrees, or thereabout, in advance of the cranks for operating the front piston, stops for limiting the distance the pistons shall come together, and springs 60 at the head of the connecting-rods to allow for the difference of movement between the cranks for operating the two pistons, substantially as described.

3. In a machine for making paving-blocks, the combination, with the mold and pressing-pistons for receiving the material to make a block, of a tube 25, located above the upper rear side of the mold-plate and having an opening through which the clay is fed to the machine, a vertical piston or plunger at the top of said tube for forcing the material down into the mold, and means for operating said plunger at the proper time, consisting of the arms 29 and 30, mounted rigidly on the same shaft, connecting-rods connecting the arms 29 with the plunger, cams at the lower ends of the arms 30, and pins on the connecting-rods 13 for operating them, substantially as described.

4. In a machine for making paving-blocks, the combination therewith of a vertically-movable horizontal platform for receiving the boards and paving-blocks as they are formed, vertical slideways in which the platform moves, a cord or cable connected with the platform and passing over a friction-roller and a counter-weight connected to said cord for keeping the platform in its upward position, and an endless carrier for receiving and carrying the boards and blocks as they come down on the counterweighted platform, which rises again when relieved of their weight, substantially as described.

5. In a machine for making paving-blocks, the combination of a box 36^a for receiving the boards to be fed into the machine, horizontal bars mounted in slideways carrying movable pawls 39, and connecting-rods 40, connected with the side connecting-rods 13 and with the horizontal bars for carrying the boards from the lower end of the box 36^a to and on the counterweighted platform, substantially as described.

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