No. 763,048. PATENTED JUNE 21, 1904.

L. DAVIS.

TILE MAKING MACHINE.

APPLICATION FILED JULY 15, 1903.

NO MODEL.

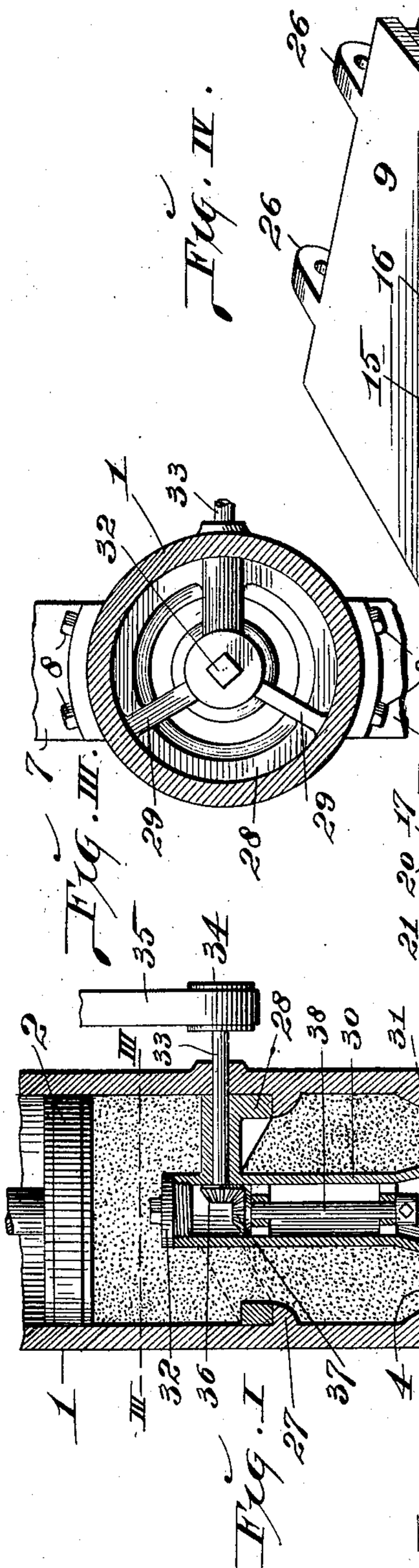

FIG. III.

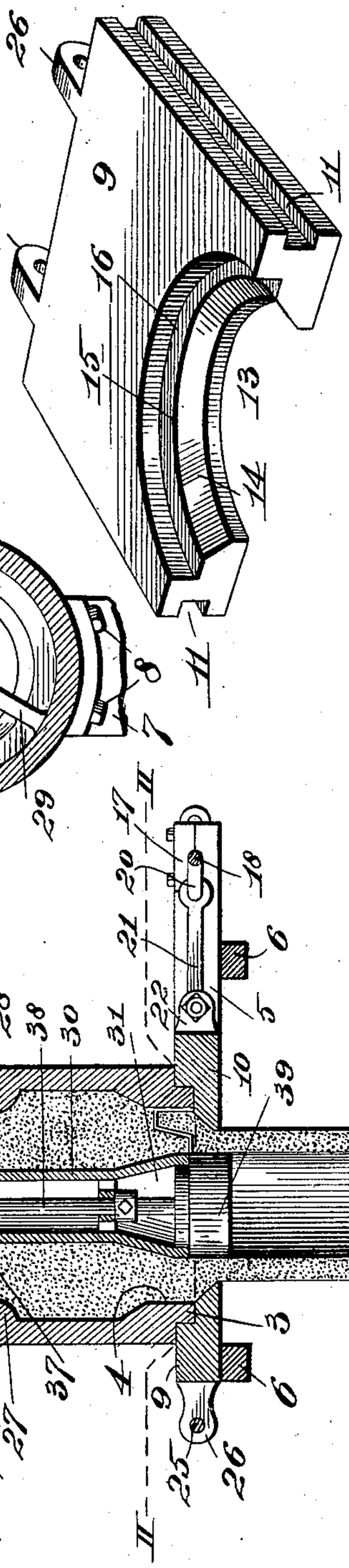

FIG. IV.

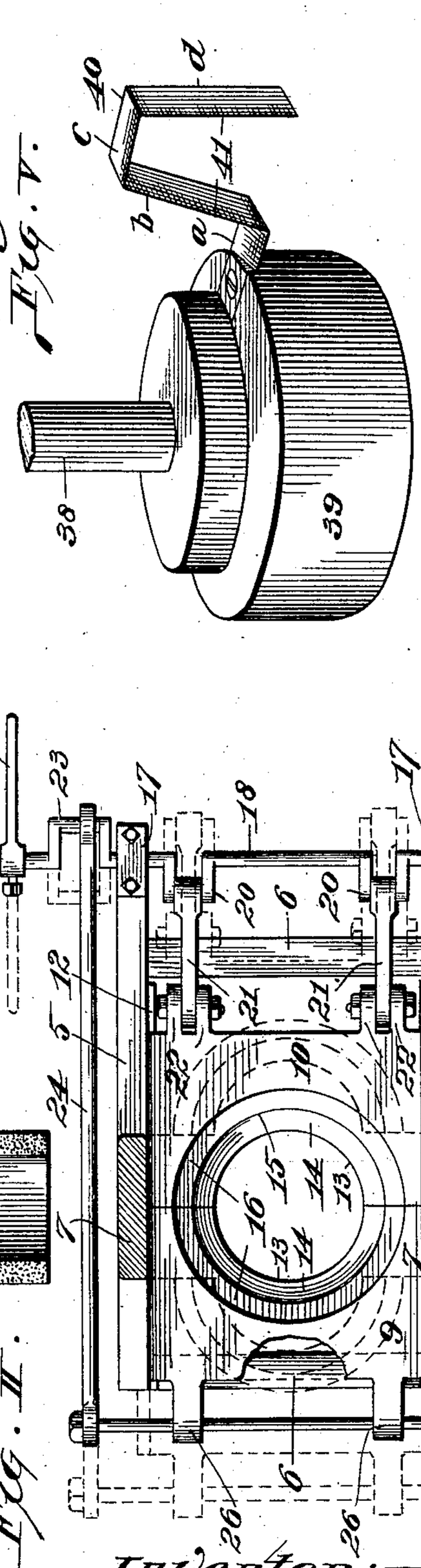

FIG. V.

FIG. I.

FIG. II.

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No. 763,048. Patented June 21, 1904.

UNITED STATES PATENT OFFICE.

LEVI DAVIS, OF ALTON, ILLINOIS.

TILE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 763,048, dated June 21, 1904.

Application filed July 15, 1903. Serial No. 165,685. (No model.)

To all whom it may concern:

Be it known that I, LEVI DAVIS, a citizen of the United States, residing in Alton, in the county of Madison and State of Illinois, have invented certain new and useful Improvements in Tile-Making Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is to provide a simple and inexpensive machine for forming that class of tile or sewer-pipe that is provided on one end with a bell or flange.

The further object of my invention is to provide a machine that will produce an extra-large-sized tile or sewer-pipe, said machine being so arranged as that these large tile will not become bent or misshapened during the time they are being formed by and removed from the machine.

My invention consists in features of novelty hereinafter fully described, and pointed out in the claims.

Figure I is a vertical sectional view taken longitudinally through the center of my improved machine. In this figure a tile is shown formed in the machine and ready to be cut off. Fig. II is a horizontal sectional view taken approximately on the line II II, Fig. I. Fig. III is a horizontal sectional view taken approximately on line III III, Fig. I. Fig. IV is a perspective view of one of the slides made use of in forming a portion of the bell or flange of the tile and supporting said tile while it is being cut off. Fig. V is a perspective view of the knife-carrying head made use of in my improved machine.

Referring to the characters of the accompanying drawings, 1 indicates the cylinder which receives the clay of which the tile are formed, there being a plunger 2 operating in the upper end of said cylinder for forcing the clay out of the lower end of the cylinder. The lower end of the cylinder 1 is provided with a downwardly-projecting annular flange 3, the interior diameter 4 of which is of the same diameter as is the exterior diameter of the flange or bell of the tile that are formed. Arranged on opposite sides of the cylinder 1 in approximate horizontal alinement with the flange 3 are the longitudinally-extending parallel bars 5, the same being formed together by the cross-pieces 6 and held in fixed position to the cylinder 1 by means of the braces 7, the upper ends of which are secured by bolts 8 to the sides of the cylinder 1. Arranged to move to and from one another between the bars 5 are the slides 9 and 10, the same being practically alike in construction. The side edges of both of these slides are provided with grooves 11, in which engage tongues 12, formed on the inside faces of the bars 5, thus insuring a perfect horizontal movement of the slides. A semicircular opening 13 is formed in the inner end of each of the slides 9 and 10. Thus when said slides are together a circular opening is formed directly beneath the lower end of the cylinder 1, which circular opening is slightly smaller in diameter than is the interior diameter of the lower end of said cylinder. An inclined face 14 is formed in the end of each slide immediately above the semicircular opening 13, the upper line 15 of said inclined face meeting the lower inner edge, with the annular flange 3 on the cylinder 1. Immediately above this line 15 in each of the slides is formed a semicircular groove 16, which when the slides are together forms an annular recess for the reception of the flange 3. The right-hand ends of the bars 5 are extended a short distance and provided with journal-bearings 17, in which is mounted a crank-shaft 18, having an operating-lever 19 upon one end thereof. This crank-shaft 18 between the bars 5 is provided with a pair of cranks 20, that project toward the slide 10, and links 21 are journaled in said cranks 20 and are also pivotally connected to ears formed integral with the slide 10. Just outside the bars 5 the shaft 18 is provided with the cranks 23, which project outwardly in a direction opposite to that of the cranks 20, and journaled to said cranks 23 are the ends of the pair of connecting-rods 24. The opposite ends of these connecting-rods are pivotally connected to the ends of a shaft 25, that is journaled in ears 26, projecting outwardly from the slide 9. This construction provides means for simultaneously moving the slides 9 and 10 to

and from one another. Formed on the interior of the cylinder 1, some distance above the lower end thereof, is an inwardly-projecting flange 27, on which is removably positioned a ring 28. Arms 29 are formed integral with this ring 28 and extend toward one another to a centrally-located vertically-positioned tube 30, the lower end of which terminates in approximately the same plane with the lower edge of the flange 3 on the lower end of the cylinder 1. The lower end 31 of this tube is slightly enlarged and is of the same diameter as the internal diameter of the tile or pipe that is to be formed. The upper end of the tube 30 is closed by a removable cap 32. One of the arms 29 is hollow and receives a horizontally-arranged shaft 33, which also passes through the wall of the cylinder 1 and receives a pulley 34, over which passes a belt 35, suitably driven. On the end of the shaft 33 within the tube 30 is fixed a beveled pinion 36, which meshes with a mating pinion 37, the latter being fixed upon a vertically-arranged shaft 38, which passes downwardly through the tube 30 and being journaled in suitable bearings formed therein. Removably positioned upon the lower end of this shaft 38 at the lower end of the tube 30 is a circular knife-carrying head 39, which head is equal in diameter to that of the enlarged lower end 31 of the tube 30.

40 indicates the knife, which is detachably secured to the top of the head 39, this knife being of peculiar construction and intended to give the proper shape to the interior and end of the bell or flange of the tile. This knife is preferably very narrow and provided with a continuous sharp edge 41 on one side. The portion *a* of the knife extends horizontally outward from the block 39, the portion *b* extending from the outer end of the portion *a* outwardly and upwardly, and from the upper end of said portion *b* a portion *c* extends outwardly in a horizontal plane, and the portion *d* extends vertically downward from the end of the portion *c* and terminates in the same plane with the portion *a*. This portion *d* is intended to ride directly against the inner face of the lower end of the cylinder 1 and the flange 3, the extreme lower end of said portion *d* bearing directly upon the edge 15 of the inclined face 14. It will be understood that the knife and driving mechanism therefor operate intermittently, the belt 35 being thrown into operation at the will of the operator.

In the operation of my improved machine the crank-shaft 18 is turned so that the meeting ends of the slides 9 and 10 are brought together, so as to form a circular opening beneath the cylinder 1, this position being illustrated in Figs. I and II. Clay of the proper consistency is now fed into the upper end of the cylinder 1 in any suitable manner, after which the plunger 2 is forced downwardly in said cylinder, and the clay being forced downwardly under pressure will pass in cylindrical form through the annular opening between the knife-carrying head 39 and the edge of the circular opening formed between the slides 9 and 10. When the body of the tile so formed has reached the proper length, the plunger 2 is stopped in its downward motion, after which the operator throws into operation the mechanism which imparts motion to the belt 35. The rotary motion thus obtained is imparted to the knife-head 39, carrying the knife 40, and the latter is moved around within the lower end of the cylinder 1 and at the completion of a revolution cuts the now completely-formed tile from the bottom of the clay within the cylinder 1. To disengage the completely-formed tile from the machine, the operator engages the lever 19 and swings the same over half a turn into the position shown by dotted lines in Fig. II, thus rotating the crank-shaft 18 and reversing the positions of the cranks thereon. This action moves the slides 9 and 10 away from one another to the positions shown by dotted lines in Fig. II, and the completely-formed tile, which previous to this last-mentioned operation was placed upon a suitable carrier, is now removed. The operator now reverses the motion of the crank-shaft 18 to bring the slides together, and the parts are ready for the forming of the next tile. The knife 40 is sufficiently narrow to allow the clay to press together after passing said knife and to pass below the slides 9 and 10 in an unbroken body.

A machine of my improved construction is easily operated, is especially applicable for extra-large-sized tile or pipe, can be operated very rapidly, and possesses superior advantage in points of simplicity, durability, and general efficiency.

I claim as my invention—

1. In a machine of the class described, a cylinder, a plunger operating therein, a pair of slides operating horizontally beneath the lower end of the cylinder, means whereby the slides are moved simultaneously to and from one another, a knife-carrying head rotating in the center of the lower end of the cylinder, a knife carried thereby, and means for imparting rotary motion to the knife-carrying head, substantially as specified.

2. In a tile-making machine, a vertically-arranged cylinder, a plunger operating therein, a pair of slides operating horizontally below the lower end of said cylinder, means whereby said slides are simultaneously moved to and from one another, a knife-carrying head rotatably arranged in the lower end of the cylinder, means whereby rotary motion is imparted thereto, and a knife carried by said head for cutting the tile from the body of clay within the cylinder and giving the proper shape to

the interior and end of the bell of the tile, substantially as specified.

3. In a machine of the class described, a vertically-arranged cylinder, a plunger operating therein, and a knife rotating within the lower end of the cylinder for cutting the tile from the body of clay within the cylinder said knife being of a contour corresponding to the interior and end of the bell of the tile, substantially as specified.

LEVI DAVIS.

In presence of—
NELLIE V. ALEXANDER,
BLANCHE HOGAN.