No. 636,620. Patented Nov. 7, 1899.

E. T. BENNETT.

BRICK MOLD SANDER.

(Application filed Jan. 10, 1899.)

(No Model.) 5 Sheets—Sheet 1.

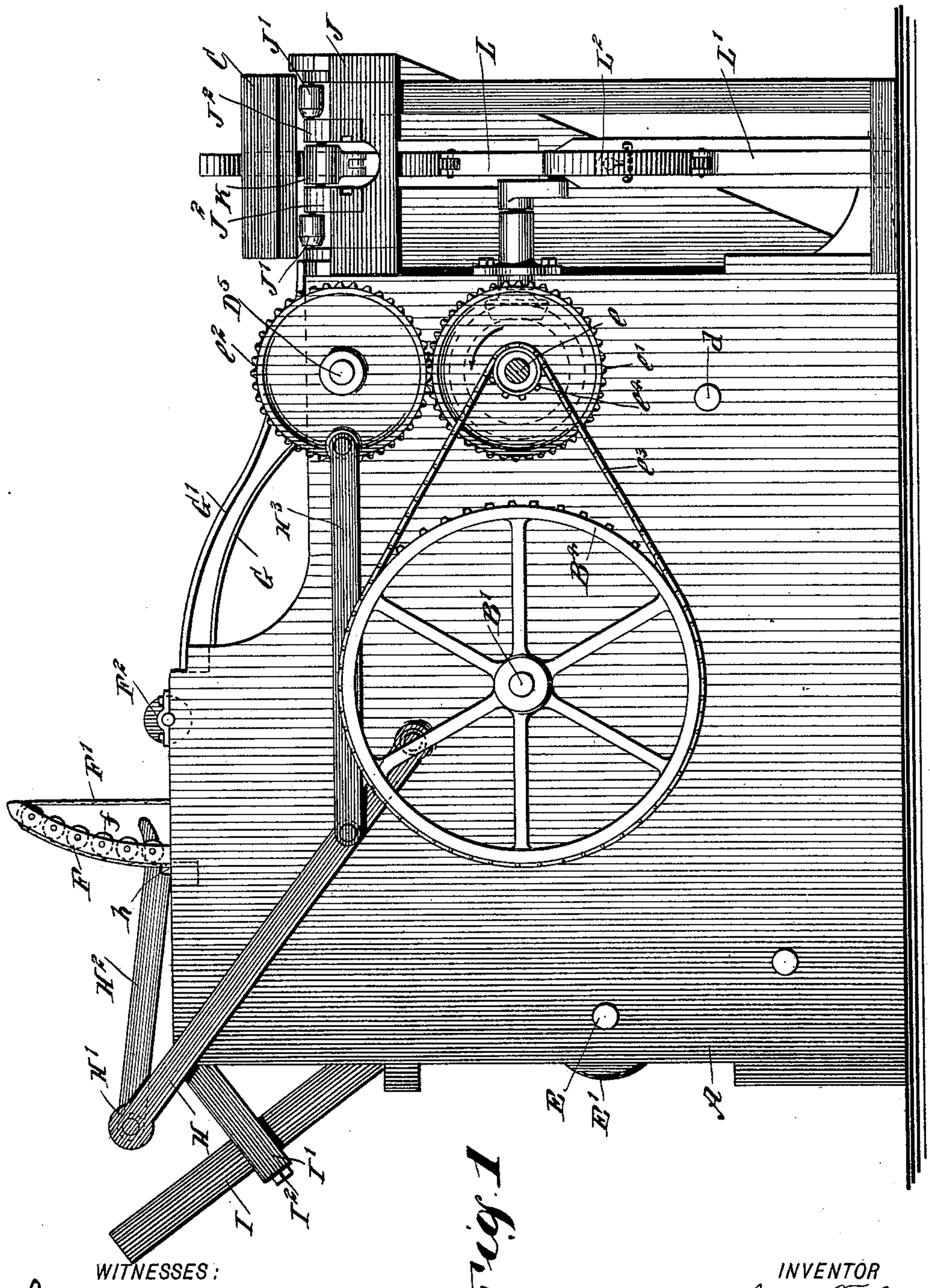

Fig. 1

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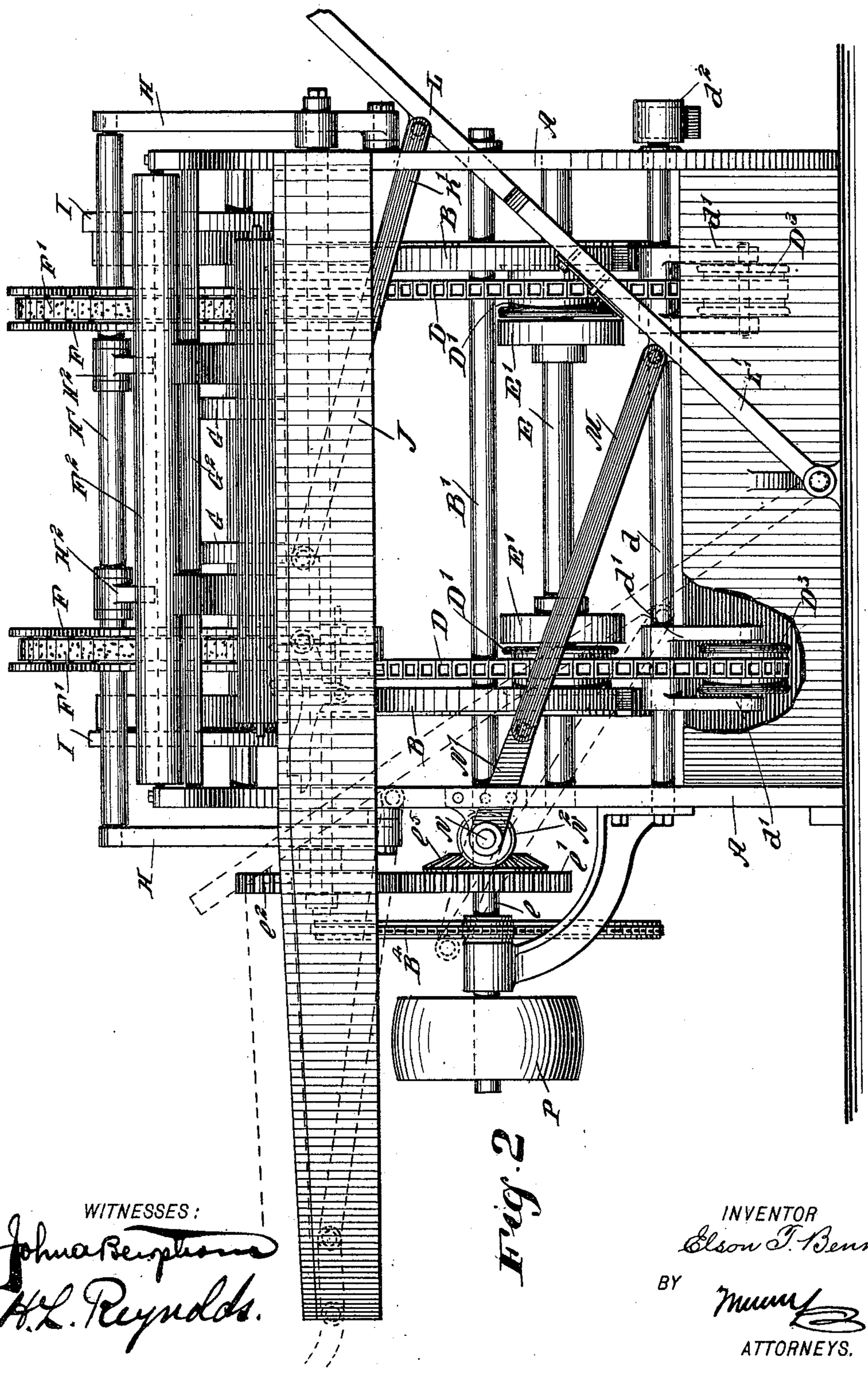

Fig. 2.

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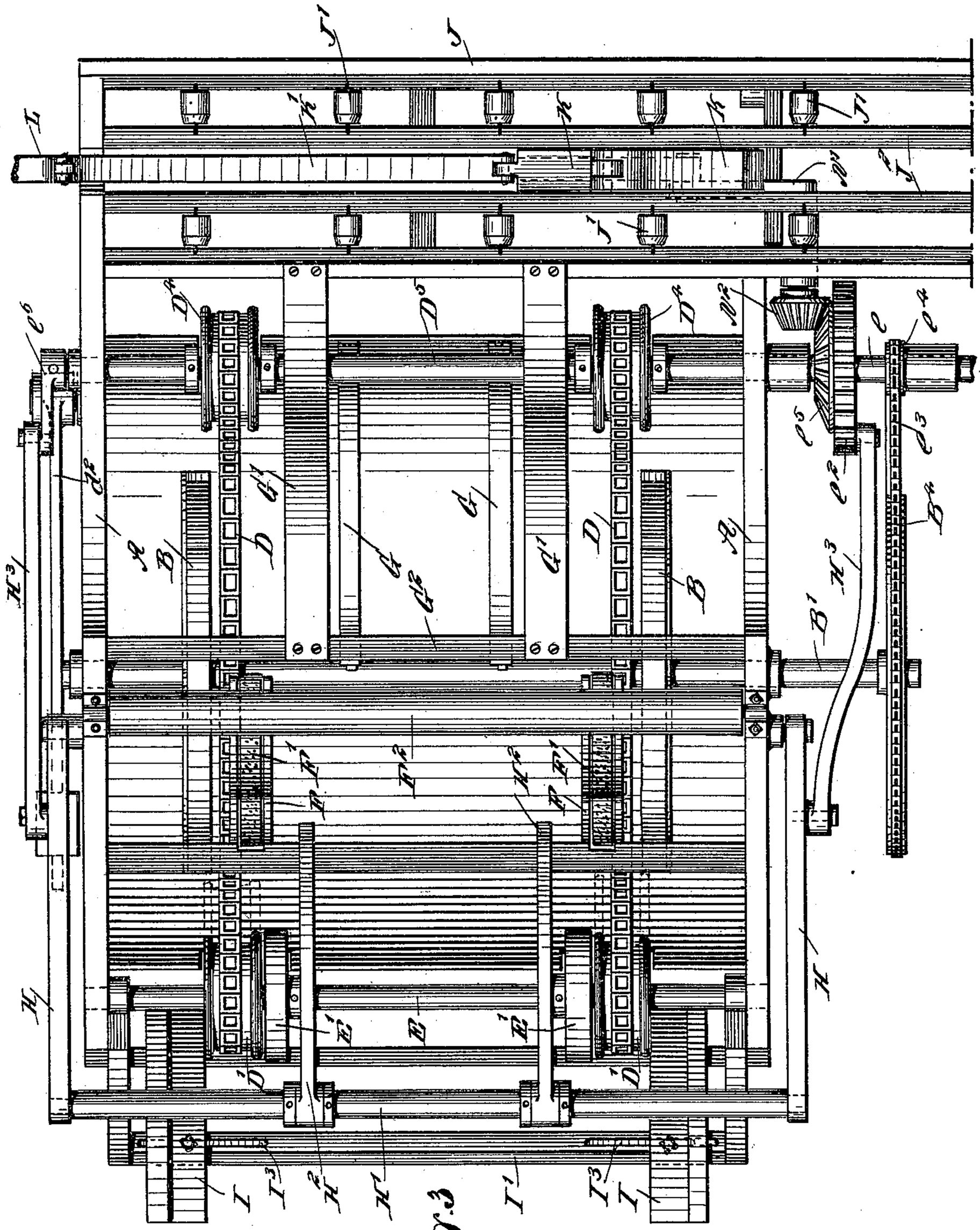

Fig. 3.

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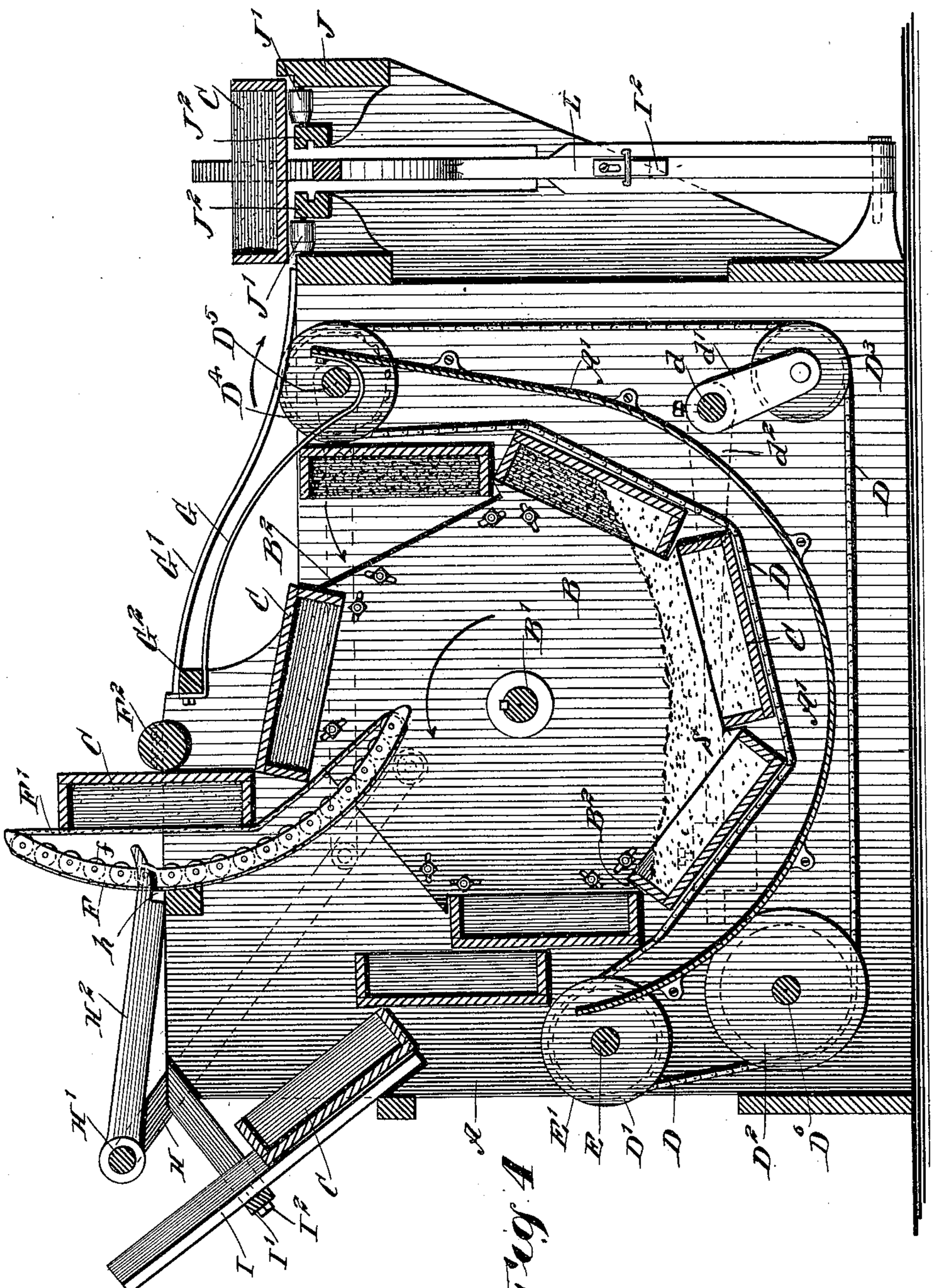

Fig. 4.

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(Application filed Jan. 10, 1899.)

(No Model.)

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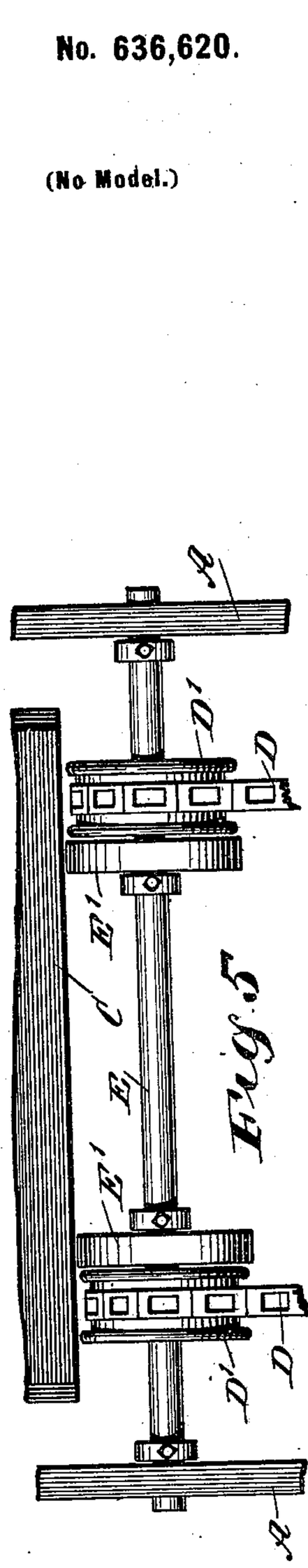

Fig. 5.

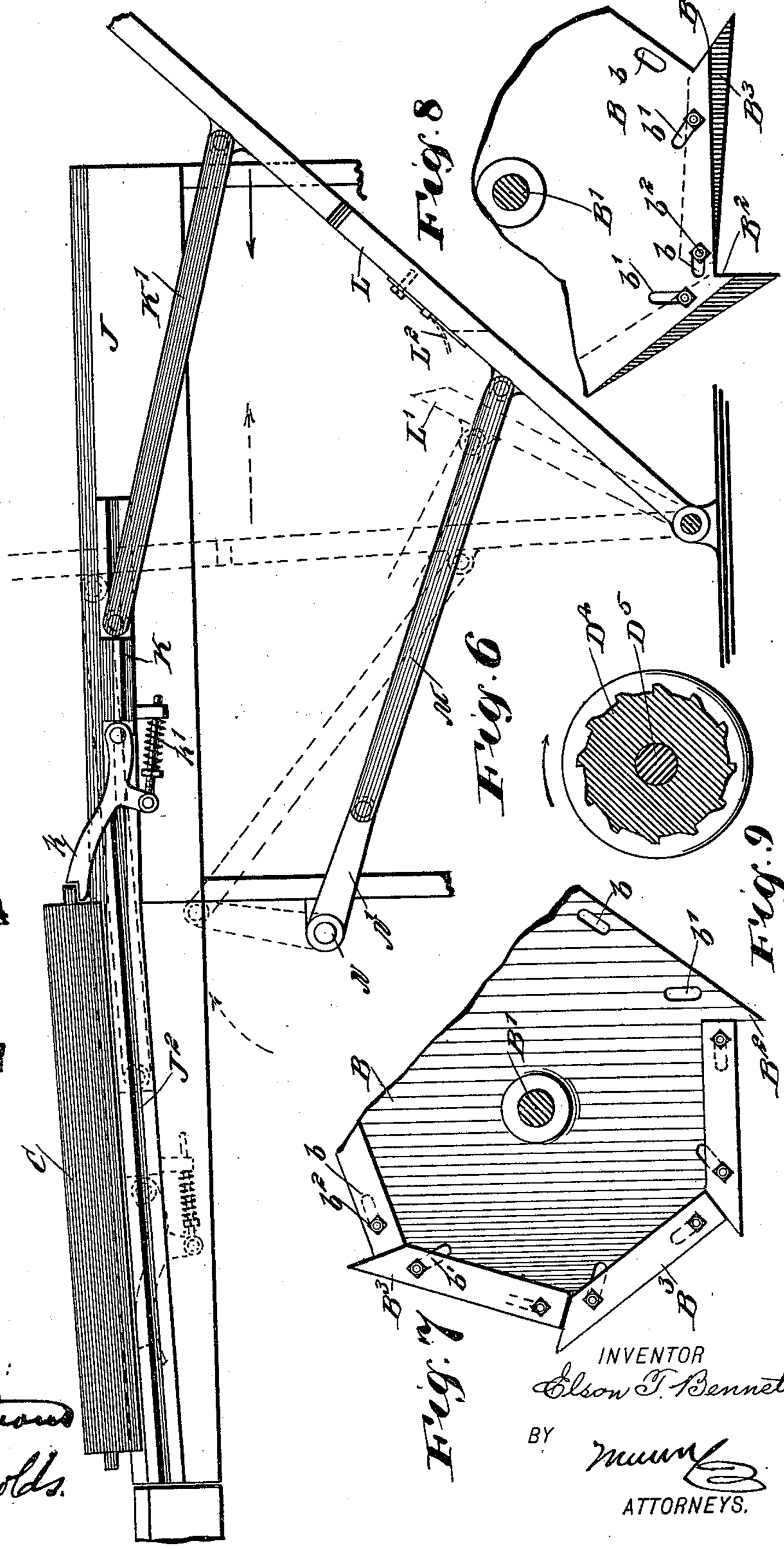

Fig. 8.

Fig. 6.

Fig. 9.

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UNITED STATES PATENT OFFICE.

ELSON T. BENNETT, OF TOWANDA, PENNSYLVANIA, ASSIGNOR TO WARREN C. BENNETT, OF SAME PLACE.

BRICK-MOLD SANDER.

SPECIFICATION forming part of Letters Patent No. 636,620, dated November 7, 1899.

Application filed January 10, 1899. Serial No. 701,739. (No model.)

To all whom it may concern:

Be it known that I, ELSON T. BENNETT, of Towanda, in the county of Bradford and State of Pennsylvania, have invented a new and Improved Brick-Mold Sander, of which the following is a full, clear, and exact description.

My invention relates to an improvement in machines used for sanding the inside of brick-molds before molding the bricks therein.

My invention consists of novel features of construction by which the mold after sanding is automatically inverted and rapped, so that the surplus sand is removed, and also of a mechanism by which the mold is fed direct to the molding-machine.

My invention further comprises the novel features which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of my device. Fig. 2 is an end elevation taken at the right-hand end of Fig. 1, the end where the molds are delivered. Fig. 3 is a top plan view. Fig. 4 is a sectional elevation taken just within one side of the frame. Fig. 5 is a detail view showing the means for supporting the molds as they are fed into the machine. Fig. 6 is a detail view showing the means for feeding the molds from the sander to the brick-molder. Fig. 7 is a detail view showing the construction of the polygonal disk upon which the molds are supported and the manner of adjusting the disk to molds of different sizes. Fig. 8 is a detail view showing the same features with parts in different position, and Fig. 9 is a view of one of the sprocket-wheels by which the chain is driven.

In the ordinary brick-mold sander it is necessary to feed the molds into the machine one at a time and to time the feeding so that the mold will be introduced at the proper time and that there shall be no interruption to the feeding. It is also necessary with the ordinary sander to rap the boxes by hand in order to remove the surplus sand and also to feed the molds to the molding-machine by hand. The object of my invention is to make this work, as far as possible, automatic, so that all that is necessary to do by hand is to supply the molds to the machine as fast as may be needed.

The means of sanding the molds is similar to that ordinarily employed, consisting of two rotatable disks and an endless belt, which passes about a portion of the disks, so as to hold the molds against the peripheries of the disks, the sand for use being placed upon the molds, which are held against the lower portions of these disks and between said disks.

The shaft B′ is the shaft upon which the aforesaid disks B are mounted, and the disks, as usual in such sanders, are polygonal, the sides of the polygon being made of such length as to accommodate a single mold. The sides of the polygon are made at one end to overlap the preceding side of the polygon, so as to form a tooth or ledge B^2, as indicated in Figs. 7 and 8. This ledge or tooth engages the edge of the mold C, as clearly shown in Fig. 4, so as to furnish a positive engagement to carry the molds about with the disks. The molds are held in engagement with the disks by means of endless belts D, which pass over a series of rollers, so as to encircle the lower portions of the disks. The molds are fed between the disks and the belts where the belts D pass about the pulleys D′ upon the shaft E, which is located at a little higher position than usual in brick-mold sanders, the object being to facilitate the automatic feeding of the molds to the machine, as will be hereinafter described. Beneath the shaft E is a shaft D^6, carrying guide-pulleys D^2, which act as idlers to control the lower run of the belts D, and between the two runs of the belts is secured a curved plate A′, so as to prevent any sand from dropping down into the lower part of the machine.

A shaft D^5 extends across the machine upon the opposite side of the disks and is located considerably above the shaft B′, which carries the disks. The shaft D^5 is provided with pulleys D^4, (shown in detail in Fig. 9,) said pulleys being provided with sprocket-teeth adapted to engage the links of the belts D. The curved arrow in Fig. 9 shows the direction of rotation of said pulleys. It will be observed that the forward edges or flanks of the teeth of the pulleys D^4 are beveled, the

object of this being that the wheel may slip upon the belts when the belts become caught or when the rate of feeding is less than the rate of rotation of the wheel. This permits the rotation of the pulleys D^4 at a rate to correspond with the fast rate of speed necessary and by slipping of the teeth to accommodate the pulleys to a lower rate of speed.

A second set of idler-pulleys D^3 is provided, said pulleys being located beneath the pulleys D^4 and mounted upon swinging arms d', said arms being pivoted upon a cross-shaft d, to one end of which is connected a counterweighted lever d^2. The counterweight upon this lever acts to maintain the tension upon the belt and yet yields when necessary.

The disks B, which carry the molds, are provided with adjustable bars B^3, by means of which the length of the sides may be changed, so as to accommodate the same machine for use with molds of different sizes. The disks are provided just within the sides thereof with two sets of slots b and b', the slots b being located at one end of the sides and substantially parallel therewith, while the slots b' are located near the other end of the sides and are substantially parallel with the sides of the ledges or teeth B^2.

The adjustable bars B^3 are secured to the disks by means of bolts b^2, which pass through said slots b and b'. These bars may be adjusted inward, so that their outer edges correspond substantially with the outer edges of the disks, or may be adjusted outward, so as to project the pointed or forward edge thereof beyond the surface of the disks, thus lengthening the sides of the disks and accommodating molds of greater width.

Upon the shaft E and alongside of the pulleys D', over which the belts D pass, are located the idler-pulleys E'. These idler-pulleys are of sufficiently larger diameter than the pulleys D' as to support the molds C and prevent them from being engaged by the belts D. This feature is shown clearly in Figs. 2, 3, 4, and 5.

The molds C are fed to the machine by means of a chute or guide consisting of two bars I, which are angular in cross-section and placed at such a distance apart as to hold the molds between them. The guides are supported upon a cross-bar I', provided with longitudinal slots I^3, (clearly shown in Fig. 3,) and the guides I are held thereto by means of bolts I^2, passing through said slots and the guides. By this means the guides may be adjusted to accommodate molds of different lengths. The guides I are located at such an elevation that each mold as it slides down the same will engage the rear side of the preceding mold and force its upper edge over toward the disks B, as clearly shown in Fig. 4, thus forcing the molds in position so that they will be engaged by the hooks B^2 upon the disks. The mold which is in position to be next engaged by the disks rests upon the peripheries of the idler-pulleys E' and is engaged by the next-following mold, so as to be forced toward the disks. By means of this construction it is possible to fill the guide-bars I with molds, and it is not necessary to insert each mold separately and at exactly the right time. It is therefore an easier matter to properly feed this machine than the ordinary sanders, where the insertion of each mold must be exactly timed.

The molds after being engaged by the disks are carried about the lower peripheries thereof until they reach about the level of the shaft B'. At this point the sand has been mainly discharged from the molds and the upper edge of the mold tends to fall away from the disks. This is due to the fact that the support for the molds is upon their inner edges. The position of the molds at this point is clearly shown in Fig. 4, where one of the molds is shown as having its under surface or bottom in engagement with the pulleys D^4. At this point the mold strikes the guide-bars G, which force the upper edge of the mold over toward the disks, so that it eventually drops down upon the disks, as shown by the preceding mold, thus jarring the mold while in an inverted position sufficiently to remove the surplus sand. In this manner the necessity for hand-rapping is avoided. The mold is still in engagement with the teeth upon the disks, and its forward edge is then brought into engagement with curved guides by which the molds are removed from the sander. These guides consist of curved bars F, located so that their lower ends project inwardly beyond the peripheries of the disks, and these bars are provided with a series of friction-rollers f, which project slightly from the inner edge of the bars. To prevent the corners of the molds from catching between these rollers, an endless belt F' is provided, which extends about the guides F and is interposed between the molds and the rollers. As the forward edges of the molds engage said belt the mold is forced upward until it reaches the vertical position shown by the uppermost of the molds in Fig. 4, and when it passes this vertical position it is tipped backward over a roller F^2, which extends across the machine, and the mold is thus automatically deposited upon the receiving-table, said table being ordinarily composed of bars G', which slant downward toward the conveyer. One of the ends of these bars G', as well as the corresponding end of the guides G, is supported upon a cross-bar G^2. The opposite end of the guides G is supported upon the upper portion of the partition A' or in any other suitable manner.

At one end and at opposite sides of the frame A are two arms H, pivoted to a shaft H', provided with pivoted bars or fingers H^2. The bars H are connected by means of links H^3 with crank-disks which are revolved by the operating mechanism. The bar upon one side is connected with a pin carried by the crank-disk e^6 on the shaft e, and the bar H

upon the opposite side is connected with a corresponding pin carried by a gear e^2 on said shaft *e*, and by this means the arms H are given an oscillating movement. In one extreme of their movement the arms are in a position to engage by their free end the edge of the mold as it is discharged over the roller F^2. The ends of the fingers H^2 are each provided with a notch *h*, so as to conveniently engage the mold and prevent its slipping. As the arms H are then oscillated or swung upon their pivots the mold is engaged by the ends of the fingers H^2 and forced downward upon the receiving-table until finally deposited upon the conveyer. The fingers then swing backward ready for engagement with the next mold.

The conveyer, which extends parallel with the axis of the disks B, consists of a framework J, provided with inner guide-bars J^2, said guide-bars being provided with grooves adapted to receive a sliding block K, and the conveyer is provided with a series of rollers J′, which support the molds C and enable them to be moved easily. The block K is provided with a spring-operated arm *k*, which has its ends notched, so as to securely engage an end of the molds, said arm being held upward by means of a spring *k*′, as clearly shown in Fig. 6. This spring is of such strength as to be compressed by the depression of the bar *k* as it is withdrawn beneath the molds C, but is sufficiently strong to throw it up into engagement with the molds.

The block K is reciprocated within its guides by means of a link K′, which connects it with an oscillating lever, said lever being near the floor. This lever is constructed in two parts, which are connected with each other by means of a spring L^2 in such manner that when the strain exceeds a certain amount the spring will yield and permit the disconnection of the two parts, so that the feeding of the molds will be stopped automatically if they become blocked in any manner. The construction of this lever, as shown, consists in making the lower part of the arm L forked, so as to accommodate the second member L′ between the parts thereof. The upper end of the member L′ is beveled, as clearly shown in Fig. 6, and when lying between the two parts of the arm L will engage a similar beveled portion upon said arm and positively prevent the member L′ being thrown farther back. The member L′ is held in this position by means of the spring L^2, which is secured to the arm L and projects slightly over the end of the member L′.

It should be understood that there is no pivotal connection between the parts of the lever.

The power for swinging the arm L is attached to the member L′, consisting of a link M, which is connected at one end to the member L′ and at its other end is connected with a crank N′, mounted upon a shaft N, said shaft being provided with a bevel-pinion N^2, which engages a bevel-gear e^5 upon the shaft *e*. The latter is a short shaft lying wholly upon one side of the machine and is provided with a pulley P, which receives the driving-belt. Upon the shaft *e* is also mounted a sprocket-pinion e^4, which carries a sprocket-chain e^3, said chain passing over a pulley B^4 upon the shaft B′, which carries the disks B. The shaft *e* also carries a spur-gear *e*′, which engages with the spur-gear e^2 upon the shaft D^5. The sand which is placed within the molds is indicated by S in Fig. 4.

The operation of my device is as follows: The molds C are placed within the guides I, down which they slide until they engage the disks B. Two of these molds are usually held in vertical position, as shown in Fig. 4, between the ends of the guides I and the disks. One of these molds is engaged by the teeth upon the disks and forced downward between the belts D and carried about the under portion of the disks B. When sufficient of these molds have been placed in position to cover the lower portions of the disks, the sand S is placed within them, and the sand constantly falls from the molds on the delivery side of the disks into the molds which have been recently added. The molds thus form a temporary bottom for the disks. The molds as carried about with the belts D are permitted to fall away from the disks as they pass above the center thereof until the molds engage the rapping bars or guides G, which force the upper edge of the molds back toward the disks, the lower edge of the molds having maintained its connection with the disks, and as the molds fall back upon the disks they are jarred sufficiently to rap out the loose sand. The molds are then engaged by the curved reversing-guides F and turned over the pulley F^2 and deposited upon the receiving-table, and after being deposited upon the receiving-table they are engaged by the fingers H^2 and forced downward along the table until they lie upon the conveyer, where they are engaged by the upper end of the member L of the oscillating lever and carried along the conveyer. As the member L returns the molds are engaged by the finger or bar *k*, and upon the next return of the member L the molds are forced forward into the brick-molder.

It is thus seen that the operation of the machine is entirely automatic, the only attention required being the supply of the molds in sufficient quantities. By reason of the construction of the feed device the molds are supplied as may be convenient, so long as one mold is held in reserve in the feeding mechanism. The number of molds in reserve in excess of this is determined only by the capacity of the feeding chutes or guides I.

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

1. A brick-mold sander, comprising a revoluble frame adapted to engage the molds,

belts or chains extending beneath the lower part of the frame and engaging the molds to hold them in contact with the frame, and a guide engaging the molds to throw them back upon the frame as they emerge from between the frame and belts, substantially as described.

2. A brick-mold sander, comprising a revoluble frame, and means for retaining the molds in contact with the lower half thereof during its revolution, and a guide extending over the frame and engaging the molds to throw them back upon the frame, substantially as described.

3. A brick-mold sander, comprising a revoluble frame provided with means for carrying the molds about with it, a mold-receiving table, curved reversing-guides having rollers thereon, and belts carried by the rollers of the reversing-guides, and engaging the molds to remove them from the revoluble frame and reverse them upon the receiving-table, substantially as described.

4. A brick-mold sander, comprising a revoluble frame provided with means for carrying the molds about with it, a mold-receiving table, curved reversing-guides having rollers thereon, and a belt passing about the guide outside the rollers, said guide engaging the molds to remove them from the reversible frame, and reverse them upon the receiving-table, substantially as described.

5. A brick-mold sander, comprising a revoluble frame, means for holding the molds thereto during a portion of its revolution, a mold-receiving table, a reversing-guide for delivering the molds in upright position on said table, a conveyer for moving the molds toward the mold-machine, and a reciprocating finger for engaging the molds and moving them from the table to the conveyer, substantially as described.

6. A brick-mold sander, comprising a revoluble frame, means for holding the molds thereto during a portion of its revolution, a mold-receiving table, a reversing-guide for delivering the mold in upright position upon said table, a conveyer for the molds, a pivoted swinging lever, means for swinging said lever, and a bar pivoted to said lever and notched at its free end to engage the molds and remove them from the table to the conveyer, substantially as described.

7. A brick-mold sander, comprising a revoluble frame, means for holding the molds thereto during a portion of its revolution, a mold-receiving table, a reversing-guide for delivering the molds in upright position upon the table, a conveyer chute or guide extending along one side of the receiving-table, a feeding-bar for transferring the molds from the table to the conveyer-chute, and an oscillating feed-bar for engaging the molds upon and moving them along the chute or conveyer, substantially as described.

8. A brick-mold sander, comprising a revoluble frame, means for holding the molds thereto during a portion of its revolution, a mold-receiving table, a reversing-guide for delivering the molds in upright position upon said table, a conveyer chute or guide extending along one side of the receiving-table, a feeding-bar for transferring the molds from the table to the conveyer-chute, an oscillating feed-bar for engaging the molds upon and moving them along the chute or conveyer, and a yielding or spring-held power connection to said oscillating feed-bar, substantially as described.

9. A brick-mold sander, comprising a revoluble frame, a chain or belt extending about the lower portion of the frame and holding the molds to the frame, supporting-wheels therefor, and idler-wheels mounted upon the shafts of the belt-supporting wheels at the feeding-point, said wheels being larger than the belt-wheels and carrying the molds before their introduction between belt and frame, substantially as described.

10. In a mold-sander, the combination with a support, of a frame mounted to turn therein and serving to carry the mold, a belt moving in time with the frame to press the molds against the frame, the belt extending around a portion of the frame, and means at one end of the belt for throwing the molds sharply back upon the frame as the molds leave the belt.

11. In a mold-sander, the combination with a support, of a frame adapted to turn and to carry the molds to be sanded, and means adjacent to the frame for throwing the molds back sharply upon the frame after the molds have been sanded, whereby to rid the molds of superfluous sand.

12. A mold-sander, having a mold-carrying frame adapted to carry the molds through the sand, and means for throwing the molds back sharply upon the carrying-frame after they have been sanded, whereby to rid the molds of superfluous sand.

13. In a mold-sander, the combination of a mold-carrying frame, a curved guide juxtaposed to the frame and serving to receive the molds from the frame, a roller mounted adjacent to the guide and having the molds turned over the roller to reverse the molds, and means for receiving the molds from the roller.

14. In a mold-sander, the combination of a turning-frame adapted to carry the molds through the sand, a reversing-guide juxtaposed to the frame and receiving the molds from the frame, means for receiving the molds from the reversing-guide, a swinging lever driven in time with the frame, and a bar carried by the lever and adapted to engage the molds as they move on the reversing-guide, whereby to throw the molds from the reversing-guide.

15. In a mold-sander, the combination of means for carrying the molds through the sand, a reversing-guide receiving the molds from said means, and a bar mounted to move

in time with the mold-carrying means and adjacent to the reversing-guide, the bar serving to engage the molds to throw the same from the guide.

16. A mold-sander, having a mold-carrier comprising a disk mounted to turn, and a series of bars secured to the periphery of the disk, the bars being disposed at angles to each other and being engaged by the molds to support the same, the bars being adjustable longitudinally and laterally to accommodate molds of different sizes.

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