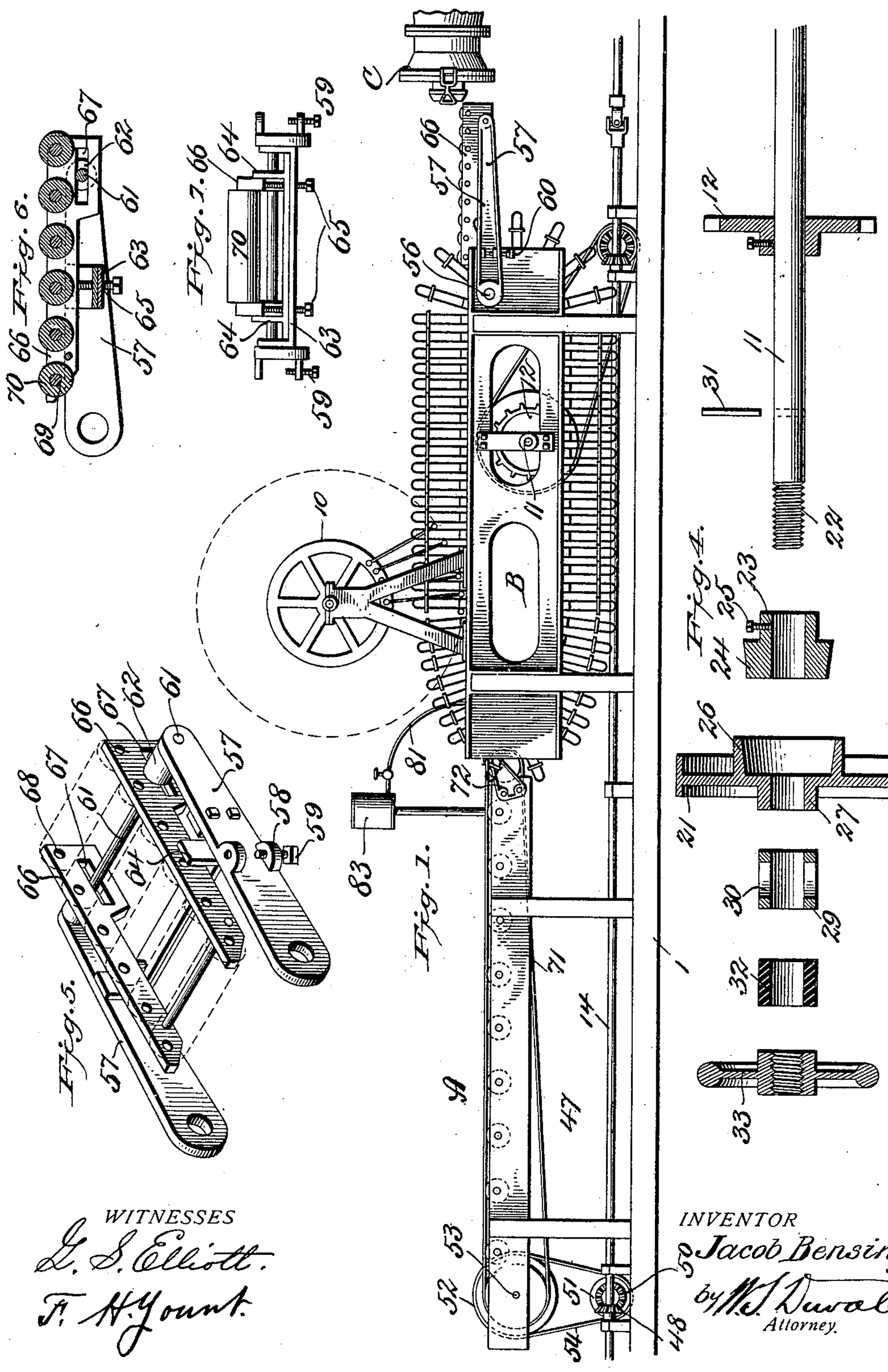
No. 621,315. Patented Mar. 21, 1899.

J. BENSING.

BRICK OR TILE CUTTING PLANT.

(Application filed June 3, 1898.)

(No Model.) 3 Sheets—Sheet 1.



WITNESSES

L. S. Elliott.

F. H. Yount.

INVENTOR

Jacob Bensing,

by W. J. Duvall.

Attorney.

No. 621,315. Patented Mar. 21, 1899.

J. BENSING.

BRICK OR TILE CUTTING PLANT.

(Application filed June 3, 1898.)

(No Model.) 3 Sheets—Sheet 2.

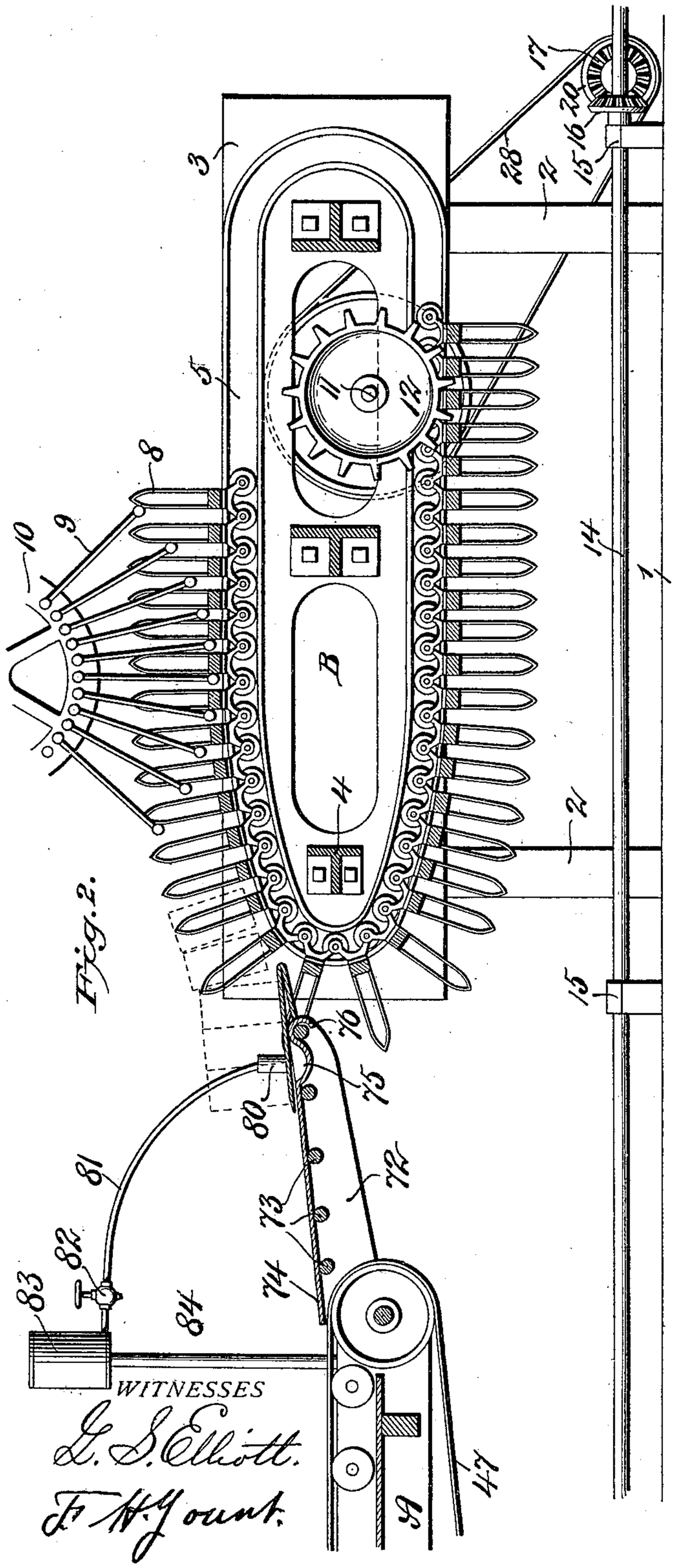


Fig. 2.

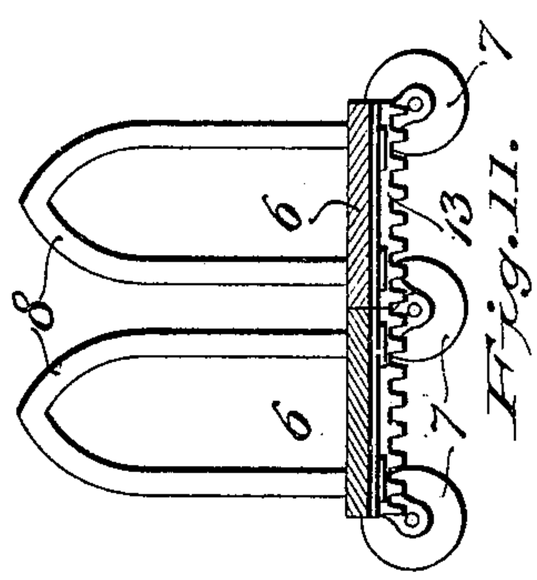


Fig. 11.

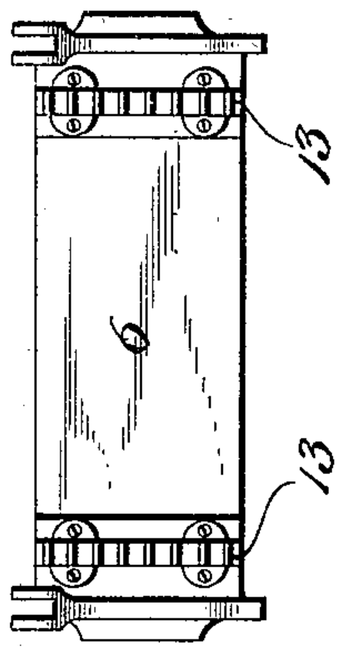


Fig. 10.

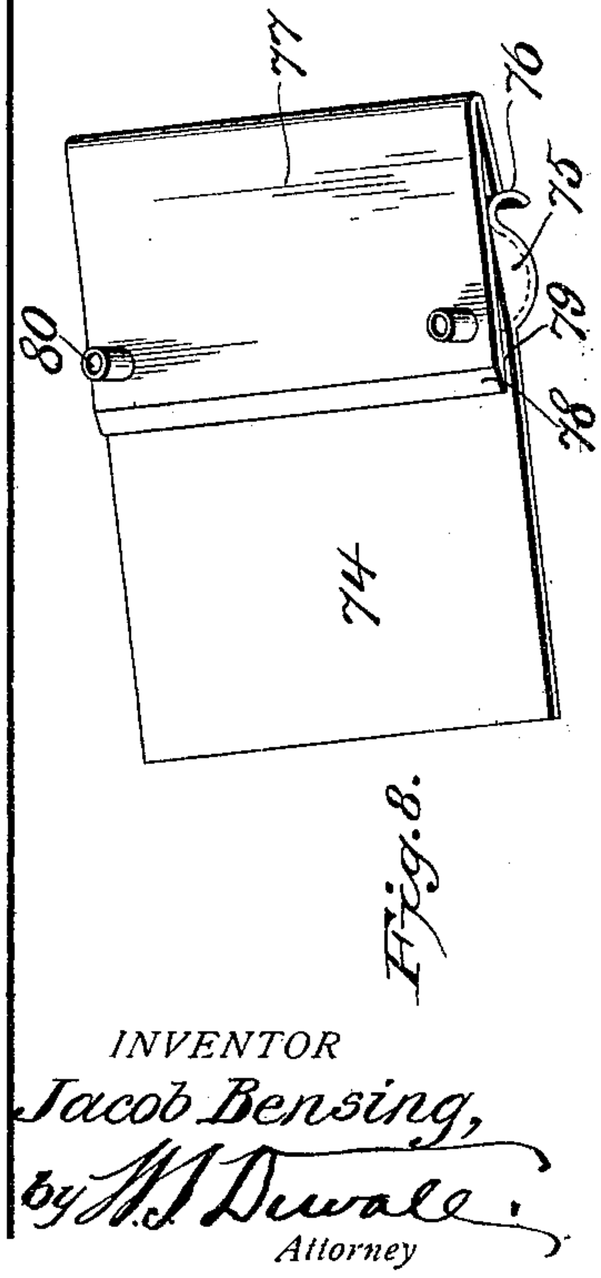


Fig. 8.

WITNESSES

L. S. Elliott.

F. W. Yount.

INVENTOR

Jacob Bensing,

by W. J. Duvall,

Attorney

No. 621,315. Patented Mar. 21, 1899.

J. BENSING.

BRICK OR TILE CUTTING PLANT.

(Application filed June 3, 1898.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

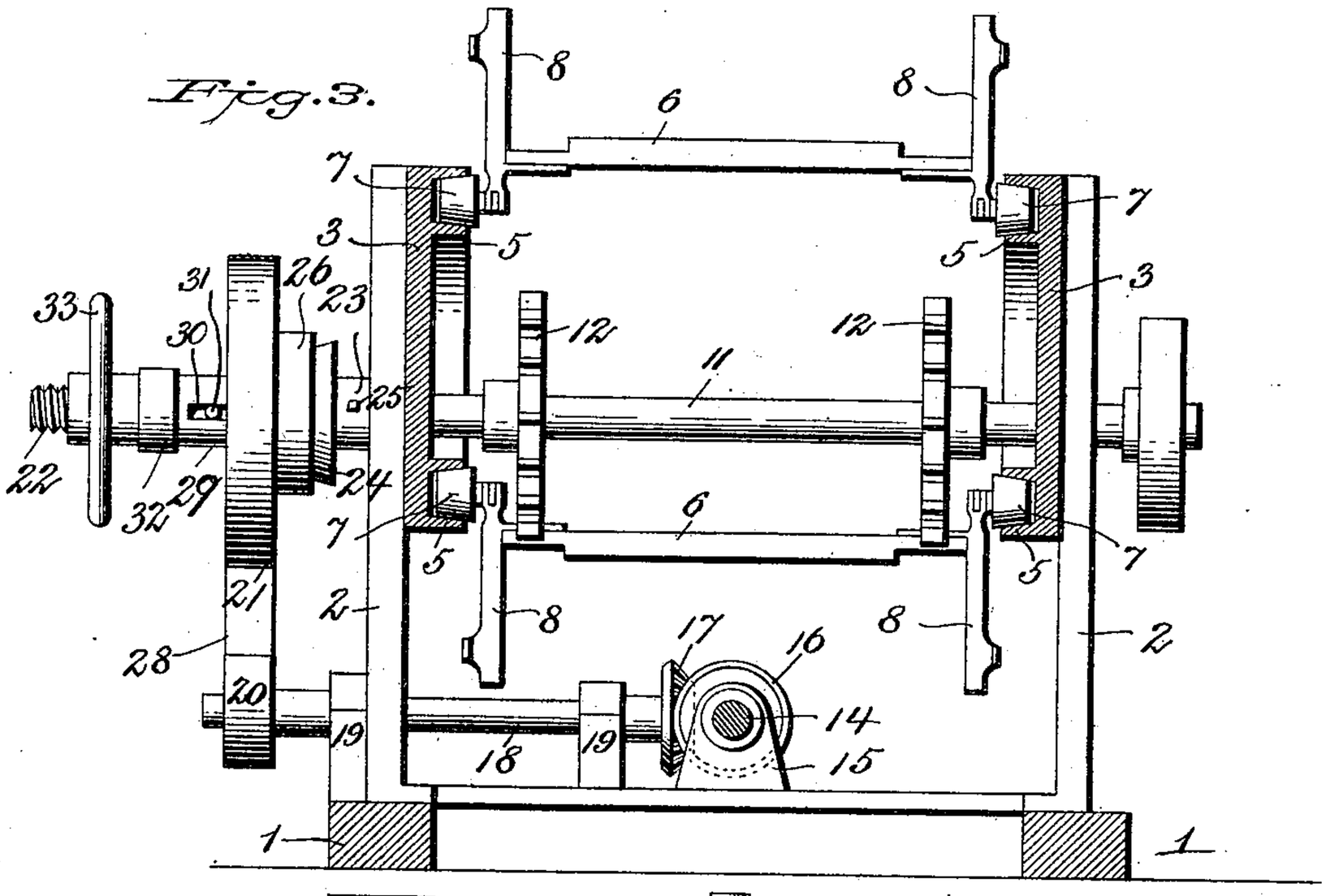
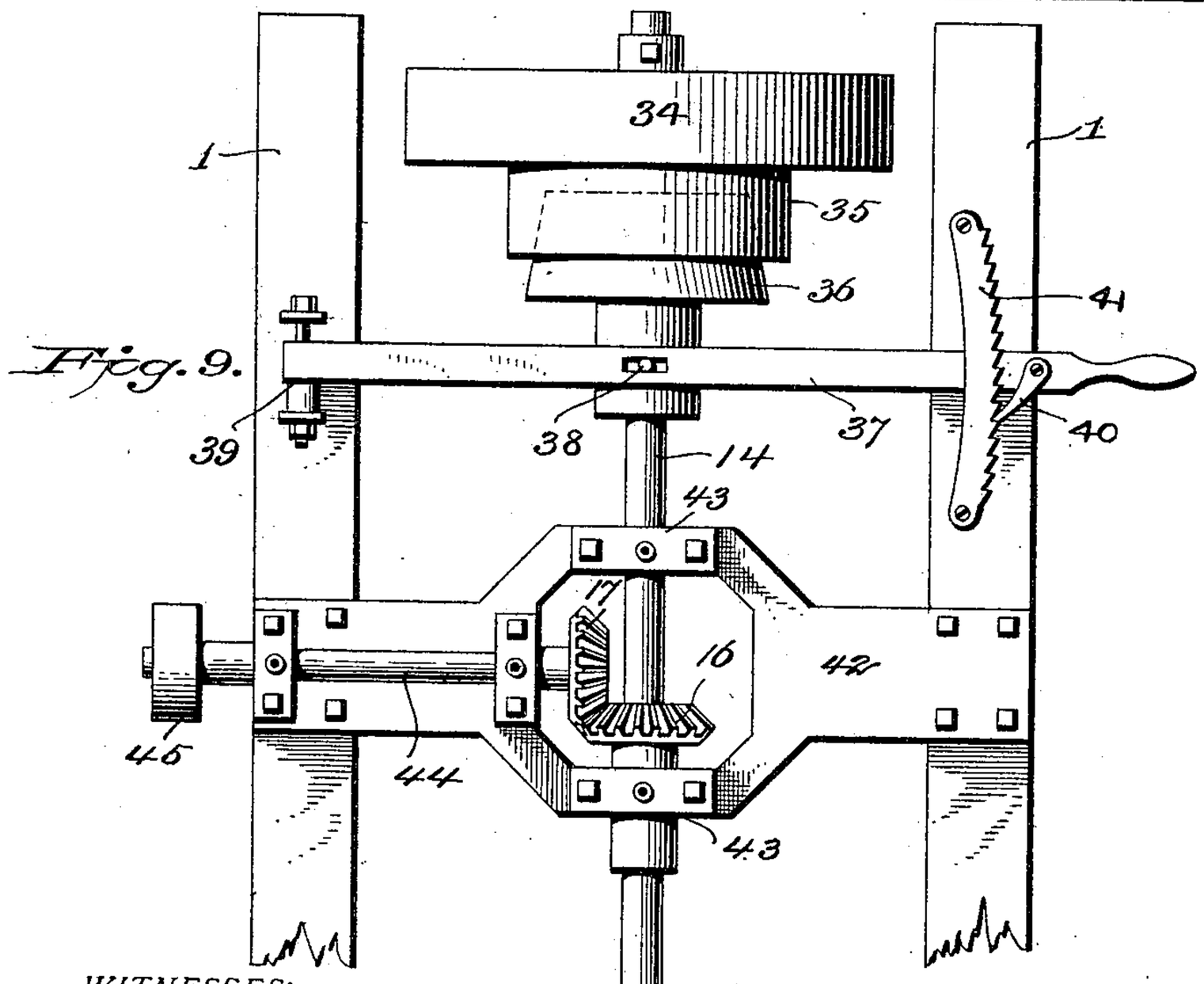


Fig. 9.



WITNESSES:

L. S. Elliott.

C. F. Duvall

INVENTOR:

Jacob Bensing.

by W. J. Duvall, Attorney

UNITED STATES PATENT OFFICE.

JACOB BENSING, OF MALINTA, OHIO.

BRICK OR TILE CUTTING PLANT.

SPECIFICATION forming part of Letters Patent No. 621,315, dated March 21, 1899.

Application filed June 3, 1898. Serial No. 682,421. (No model.)

To all whom it may concern:

Be it known that I, JACOB BENSING, a citizen of the United States, residing at Malinta, in the county of Henry and State of Ohio, have invented certain new and useful Improvements in Brick or Tile Cutting Plants; and I do hereby 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.

My invention relates to improvements in brick and tile cutting machines.

The objects of my present invention are to produce a machine wherein the speed of the machine is controlled by the movement and speed of the column of clay in contradistinction to constructions heretofore employed, wherein the movement of the column of clay furnishes the power to operate the cutting-machine; or, in other words, my object is to operate the cutting-machine by power transmitted through a friction driving device, which latter is controlled by the movement of the column of clay.

Further objects of my invention are to facilitate the transmission or travel of the column of clay from the mill to the cutting-machine and from the latter to the delivery-table.

With these main and other minor objects in view my invention consists in certain features of construction, which will hereinafter appear and be particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a side elevation of a brick or tile cutting machine, a delivery-table, and the die end of a mill, the three being shown in their proper relative location and in conjunction with my improvements. Fig. 2 is a longitudinal sectional view of the cutting-machine, the adjacent end of the delivery-table, and the intermediate delivery-plate. Fig. 3 is a transverse vertical sectional view through the cutting-machine. Fig. 4 is a detail in section, showing the various parts which may compose the clutch mechanism. Fig. 5 is a detail in perspective, illustrating in full lines the frame employed between the die and the receiving end of the cutting-machine and which I term the "delivery-frame." Fig. 6 is a longitudinal sectional view of the same. Fig. 7 is an end view of the same. Fig. 8 is a detail in perspective of the delivery-plate illustrated in section in Fig. 2. Fig. 9 is a plan view illustrating a modification of the location of the clutch driving mechanism. Fig. 10 is a bottom plan view of one of the pallets. Fig. 11 is a sectional view of two of such pallets, shown connected.

Similar letters and numerals of reference indicate similar parts in all the figures of the drawings.

In carrying out my invention I employ a delivery-table A, a cutting-machine B, and a die C, arranging them in line, as is usual. Proceeding to describe in detail these several parts and their adjuncts, 1 designates the usual longitudinal sills, upon which the machines mentioned are mounted. Rising from the sills 1 are the vertical standards 2 of the cutting-machine, said standards connecting the usual sides 3, and they being connected by the cross-braces 4. The sides 3 are provided with the usual endless internal tracks 5, in which are located the ends of the pallets 6, the same being provided at said ends with wheels or rollers 7 to facilitate their travel in said tracks. These pallets are coupled together, so as to form a continuous belt, and the ends of the pallets may or may not be reduced, as shown in Fig. 2 of the drawings. Each pallet is provided with a pair of vertical guides 8, the same being located at their ends and designed for guiding the cutters 9, located on the cutting-wheel 10, all as shown in my Patent No. 563,252, granted me July 7, 1896.

Journaled in suitable bearings located in transverse alinement and formed in the side walls 3 of the frame of the cutting-machine is a transverse shaft 11, the end of which projects beyond one side of its bearing. Between its bearings the shaft 11 may be provided with spur-wheels 12, the teeth of which may engage between the reduced ends of the pallet 6, whereby, as will be obvious, a rotation of the shaft 11 will cause the endless belt or carrier to move in the tracks 5 and an operation on the part of the cutting-wheel.

If preferred, the pallets may be of a uniform width throughout their length, in which instance, as shown in Fig. 10, short sections

of toothed bars 13 may be secured to their under sides, so that a continuous rack is formed at each side, into the teeth of which the spur gears or wheels may engage.

I propose to employ a suitable clutch mechanism for imparting motion to the transverse shaft 11, such motion being transmitted preferably through a line-shaft 14, which is mounted longitudinally in suitable bearings 15, supported on the sills 1. The line-shaft 14 is provided with a beveled gear 16, which meshes with and drives a companion beveled gear 17, mounted on a transverse counter-shaft 18, located in suitable bearings 19, and which at one end is provided with a pulley 20.

Any suitable construction of frictionally-geared pulley 21 may be located on the outer extended end of the shaft 11, and although I will proceed to describe one simple and efficient form of friction-clutch, yet I desire it understood that I do not limit my invention to any particular form of clutch or to its location, as I may vary both at will and the latter preferably by locating the clutch on the line-shaft 14, as illustrated in Fig. 9 and as will be hereinafter described.

Referring to Figs. 3 and 4, it will be seen that I thread the outer end of the shaft 11, as indicated at 22. Over the shaft 11 I slip a collar 23, which is provided with an enlarged conical friction-face 24, retaining said collar in position immovably on the shaft 11 by a binding-screw 25. I next slip upon the shaft the loose pulley 21, which at that side adjacent to the collar 23 is provided with an annular conical friction-flange 26. It will be obvious that the pulley 21, being loose upon the shaft 11, may be connected by a drive-belt 28 with the pulley 20 and operated idly thereby as long as it is not forced into frictional engagement with the collar 23 of the shaft 11. It now remains, therefore, to provide a convenient and simple means for causing and maintaining a proper and yielding frictional engagement between these parts. I therefore preferably slip on the shaft 11 a collar 29, the same having a slot 30 formed longitudinally therein for the reception of a pin 31, passed through the shaft, by means of which said collar is capable of a slight longitudinal movement. Beyond the collar I locate a rubber collar 32, or it may be a coiled expansion-spring, and beyond this a hand-wheel 33 is threaded on the end of the shaft. It will be obvious that by rotating the hand-wheel in one direction the pulley 21 will have its conical flange 26 forced into frictional contact with the conical surface 24 of the collar 23 and that such contact may be increased or diminished and will be yielding by reason of the interposed expansion-collar 32.

If preferred and as a substitute for the above, a friction-pulley 34 may be located on the line-shaft 14, the same being loose and held in position by suitable collars fastened upon said shaft and driven by a belt (not shown) leading from any power. The pulley may be provided with a conical annular flange 35, into which may be forced for frictional contact a splined conical collar 36, also mounted on the shaft 14 and controlled by a hand-lever 37, loosely connected, as at 38, between its ends thereto, while one end is pivoted in bearings 39, and its opposite or free end terminates in a handle and is provided with a pawl 40 for engaging a convenient tooth in a rack-bar 41. In such instance also I would prefer to employ an open frame 42, having bearings 43 for journaling the line-shaft 14 and for the accommodation of a short transverse counter-shaft 44, (the equivalent of the shaft 18,) which extends beyond the frame to receive a pulley 45 (the equivalent of pulley 20) and which would be connected by a belt (not shown) to and drive a fixed pulley (not shown, and which would take the place of loose pulley 21) upon the transverse shaft 11 of the cutting-machine. In this manner both the cutting and delivering mechanisms would be regulated as to speed by the column of clay. The shaft 14 drives the shaft 44 by means of the intermeshing beveled gears 16 and 17, as before described. It is obvious that in this latter construction in order to start and stop the machine it is simply necessary to move the lever 37 forward to cause the conical collar 36 to engage with the loose pulley 34 and backward to disengage them, the first movement starting up the machine and the latter movement stopping it.

In either of these constructions or arrangements of the clutch mechanisms to operate the delivery mechanism I may employ a beveled gear 48 under the end of the delivery-table on the shaft 14, intermeshing therewith a similar gear 49, mounted on a short transverse shaft 50, disposed at a right angle to the shaft 14, and which may carry at its outer end a pulley 51, that may be connected by an endless belt 54 to a pulley 52, located on one of the end shafts 53 of the delivery-table.

As before stated in the previous patents granted me, the cutting-machine was operated by the column of clay as the same was forced through the die of the mill. This works well in many instances, but not in all, as practice has demonstrated that certain clays are of a very slippery nature, especially fire-clays, &c., and they being pressed through the die of a stiff mud-machine their surfaces become polished and slippery and will not adhere sufficiently to the endless carrier to successfully operate the cutting-machine and therefore slide and work ahead on the carrier, obstructing the successful working of the machine and causing waste of ware by not perfectly cutting. Again, in making drain-tile, hollow brick, and other ware, where the columns of clay are light and the walls thin, the column will many times kink or buckle. By the present invention, however, it will be seen that I operate the cutting-machine in a positive and direct manner through the friction-clutch and that the clay column controls the

speed of its movement, and, in fact, should the clay column stop the cutting-machine will also stop, although the balance of the machinery will continue to run.

Referring now more particularly to Figs. 1, 5, 6, and 7, I will proceed to describe what I term a "delivery-frame." By this I mean a frame located between the die of the mill and the receiving end of the cutting-machine. The object of employing this frame is to facilitate the transmission of the column of clay to the receiving end of the cutting-machine without danger of breaking the column between these points, and also to locate the cutting-machine such a distance from the die as will permit (the delivery-frame being removed) of a person passing between the two for any purpose whatever.

Upon bolts 56, projecting from the sides 3 at their delivery end, I pivot, so as to freely swing, a pair of side bars 57, each of which is provided with a lug 58, in which is threaded an adjustable stop-bolt 59, designed when the bars are lowered to abut against laterally-projecting lugs 60, located on the sides 3. By adjusting the bolts 59 the bars 57 may be raised and lowered. The ends of the bars 57 project beyond the receiving end of the cutting-machine and to within a few inches of the die C of the mill, and these ends are connected by means of a transverse rod 61, at the opposite sides of which may be located spacing-sleeves 62. At an intermediate point the bars 57 are connected by a stirrup 63, which is provided near its ends with upwardly-projecting guide-lugs 64, and adjacent to each of them has threaded therein an upwardly-projecting set-bolt 65. 66 designates a pair of inner side frames, the front ends of which are longitudinally slotted, as at 67, to receive the rod 61, and the rear portions of which rest upon the adjusting-bolts 65 of the stirrup, the outer faces of the inner side bars 66 being embraced and guided at their fronts by the spacing-sleeves 62 and in rear of the same by the guide-lugs 64. The two bars 66 are at intervals perforated, as at 68, to receive the bearing trunnions or shafts 69 of a series of transversely-disposed rollers 70.

It will be seen that the entire device for delivering the column of clay to the cutting-machine may be swung upward to permit of the passage of a workman between the cutting-machine and the die of the mill; furthermore, that a proper elevation of the entire device may be secured by a manipulation of the adjusting-bolts 59, and, finally, that a longitudinal adjustment of the inner roller-carrying frame may be obtained and an independent vertical adjustment also obtained through the bolts 65.

Reference is now called to Figs. 1, 2, and 8 for the purpose of describing in detail the delivery-plate that is located between the adjacent ends of the cutting-machine and the delivery-table A. The object of the aforesaid delivery-plate is to facilitate the delivery of the cut ware from the cutting-machine to the delivery-table, the belt of which, as will be understood, is run at a somewhat greater speed than is the endless belt of the cutting-machine. I bolt to the sides 71 of the delivery-table and at one end of the same a pair of side bars 72, said side bars being connected at intervals by transverse rungs 73, the same being arranged in an inclined plane, as shown. Surmounting the rungs 73 and extending from a point immediately above the horizontal portion of the endless apron or belt 47 of the delivery-table is a thin sheet-metal plate 74, which between the two outer rungs is concaved or depressed, so as to form a laterally-disposed pocket 75, and beyond this point the plate is curved, as at 76, to hook over or engage with the outermost rung 73 of the series. The ends of the pocket are closed, as best shown in Fig. 8. Connected to the rear end of the plate 74 is a superimposed overhanging plate 77. This may be simply a piece of sheet metal bent upon itself and having its under side soldered or otherwise secured to the outer extremity of the plate 74 and its upper side folded over and overlapping the upper surface of the plate 74 and terminating above the same and beyond the inner edge of the pocket 75 formed therein, the front edge of the plate 77 being preferably beveled on its upper side, as at 78, and the two plates in advance of the pocket combining to form a narrow slit or feed-passage 79 to permit of any overflow of liquid passing from the pocket and over the surface of the plate 74. The plate 77 at points above the pocket 75, formed in the plate 74, may be provided with nipples 80, said nipples being connected by tubes 81 to cocks 82, leading from a suitable oil-reservoir 83, that may be supported conveniently and in any suitable manner—as, for instance, by a standard 84, rising from the side of the delivery-table frame.

It will be obvious that by adjusting the cocks 82 oil may be fed continuously into the pocket 75 and that overflowing from the same will serve to constantly coat the upper surface of the plate 74, thereby facilitating the delivery of the cut ware from the cutting-machine to the delivery-table by causing the cut ware to slide somewhat rapidly over the lubricated surface.

It will of course be understood that I have merely shown and described preferred forms or constructions of clutch mechanism, delivery-frame, and delivery-plate and that such mechanism and devices may be varied in their construction without departing from the spirit of my invention or sacrificing any of the numerous advantages apparent to those skilled in the use of this machinery.

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

1. In a brick and tile-plant, the combination with a cutting-machine, and a delivery-table arranged beyond and below the same,

of an inclined way leading from the delivery end of the cutting-machine to a point above the horizontal portion of the delivery-table, said way being provided with a transverse oil-pocket near its upper end, means for supplying oil to said pocket, and an impervious plate overlying said pocket and combining with the way to form an intermediate oil-escape.

2. In a brick and tile plant, the combination with a cutting-machine, and a delivery-table, of opposite side bars inclined and connected to the delivery-table and extending toward the cutting-machine, transverse rungs connecting the side bars, a metal plate surmounting the same and concaved between the two outer rungs to form a transverse oil-pocket and beyond that point curved to engage the outer rung, a second plate connected to the outer end thereof and bent over and beyond said oil-pocket, closures for the end of the pocket, and means for supplying oil to the pocket whereby said oil may overflow from the lower edge of the pocket and thus lubricate the lower plate.

3. In a brick and tile plant, a way for discharging the product, the same consisting of a suitable frame or support, and a metal plate having a transverse pocket formed therein between its ends, and a second metal plate overlying the said pocket and the upper end of the plate above the pocket and combining with the plate first mentioned to form an intermediate oil-discharge at the lower end of the said pocket.

4. In a brick and tile plant, the combination with a mill and a cutting-machine, of the pivoted side bars 57, the rod connecting the outer ends of the same, a rest connecting the side bars in rear of the rod, slotted inner side bars engaging the rod and mounted on the rest, and rollers connecting said inner side bars.

5. In a brick and tile plant the combination with the mill and cutting-machine, the latter being provided with stops 60, of the side bars 57, pivoted to the cutting-machine and arranged in contact with the stops, the rod 61 having sleeves 62, connecting the outer ends of the bars 57, the transverse rest 63, having flanges or lugs 64, the adjusting-screws 65 projecting upwardly through the rest, the inner side bars 66, mounted on the adjusting-screws 65, and at their front ends slotted as at 67 to receive the rod 61, and the rollers 70, having their trunnions mounted in the said side bars 66.

6. A brick and tile cutting machine comprising opposite sides having endless tracks, and an endless cutting-belt mounted in the tracks, of a transverse shaft, means for communicating motion from the same to the cutting-belt, a power-shaft, and a friction-clutch arranged between said transverse shaft and power-shaft, and means for producing a yielding contact within said clutch.

7. The combination with a brick and tile cutting machine comprising opposite sides and an endless cutting-belt, of a transverse shaft, means for conveying motion from the latter to the cutting-belt, a friction clutch-pulley arranged on the transverse shaft, means for adjusting the same, a power-shaft, and means for conveying motion from the latter to said pulley.

8. The combination with a brick and tile cutting machine, the same comprising a cutting-belt, and a shaft positively geared thereto, of a power-shaft, a belt connecting the two shafts, and a friction device for connecting said belt to one of said shafts, said device consisting of an idle-pulley having a conical hub, and a conical sliding collar, both of which are mounted on one of said shafts, and means for moving said collar into and out of contact with said pulley.

9. The combination with a brick and tile cutting machine, comprising an endless belt consisting of a series of loosely-connected pallets reduced at their ends, of a transverse shaft surrounded by the belt, means for driving said shaft, and spur gear-wheels mounted on the shaft and adapted to rotate therewith and having their teeth engaging between the reduced ends of said pallets.

10. The combination with a brick and tile cutting machine, comprising an endless cutting-belt, of a transverse shaft 11, means for conveying motion from the shaft to the belt, a drive-shaft, a pulley mounted loose upon said transverse shaft and provided with a conical flange, a conical collar splined upon the transverse shaft in line with the flange of the pulley, a hand-wheel threaded on the transverse shaft, an expansion-collar interposed between the hand-wheel and the pulley, a pulley on the driving-shaft, and a belt between the same and the pulley on the transverse shaft.

JACOB BENSING.

Witnesses:
JNOS. DEIMLING,
HENRY DELUENTHAL.