

J. M. SCHENK & J. H. STEWART.
TILE MACHINE.

APPLICATION FILED AUG. 19, 1907.

908,611.

Patented Jan. 5, 1909.

4 SHEETS—SHEET 1.

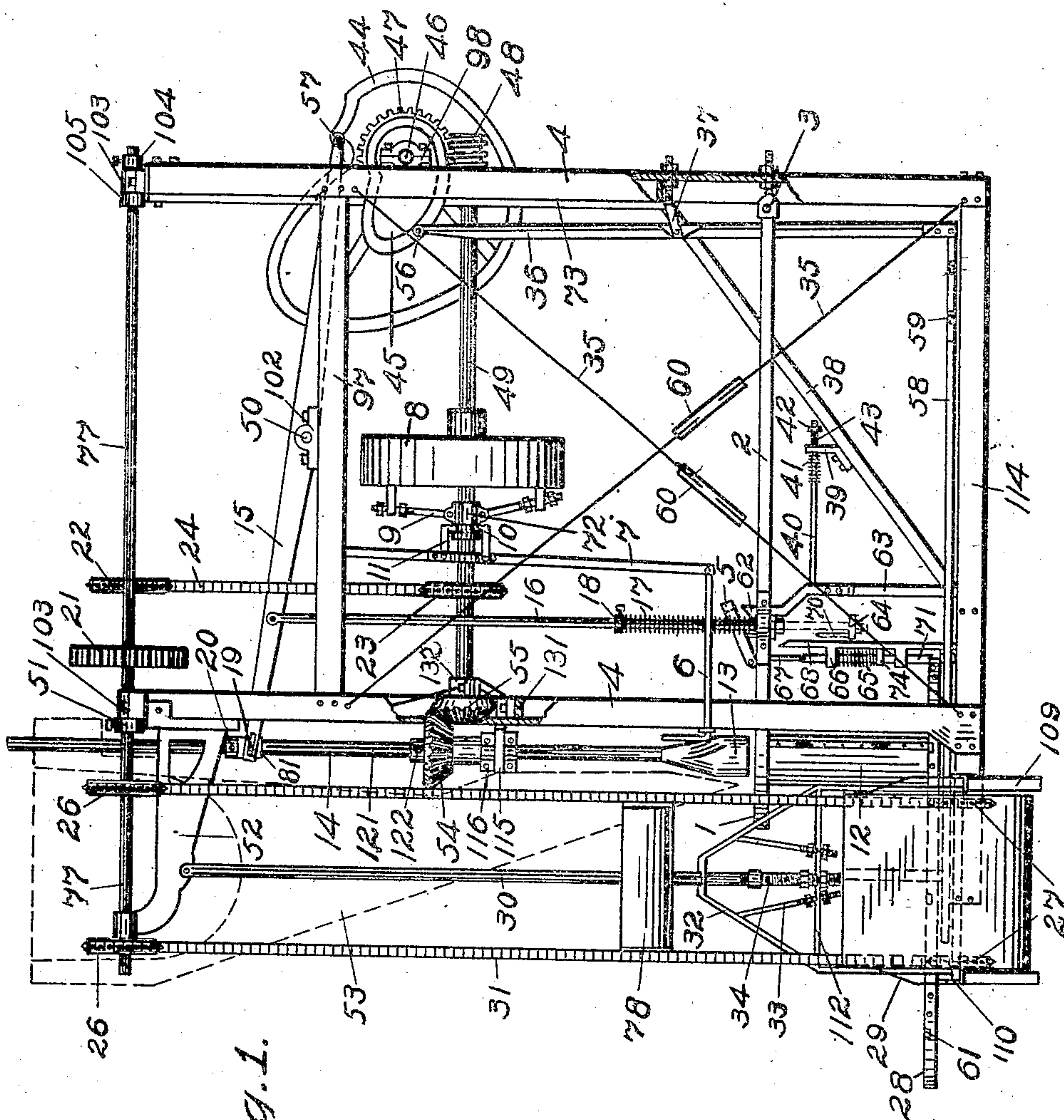


Fig. 1.

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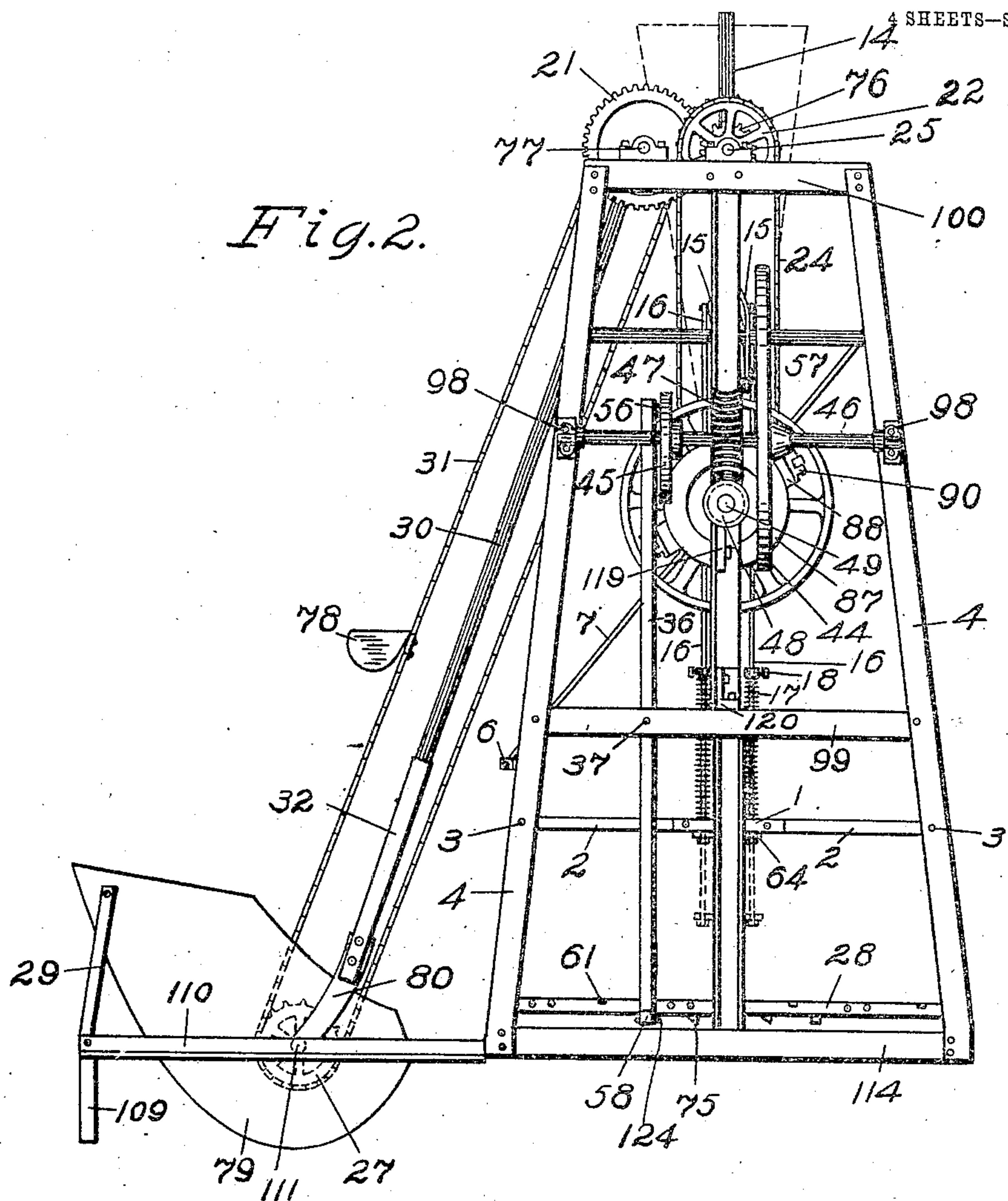
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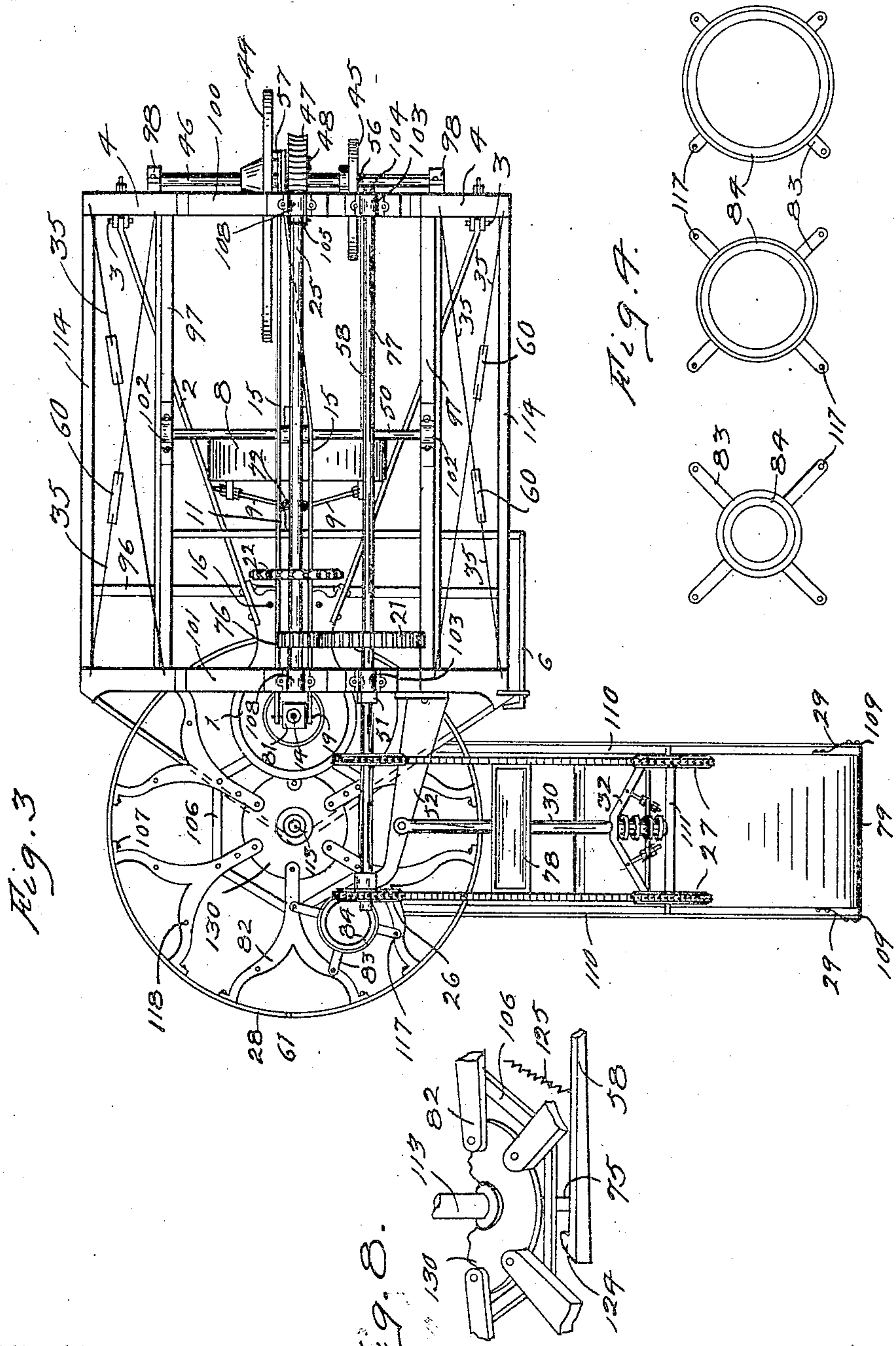
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4 SHEETS—SHEET 3.



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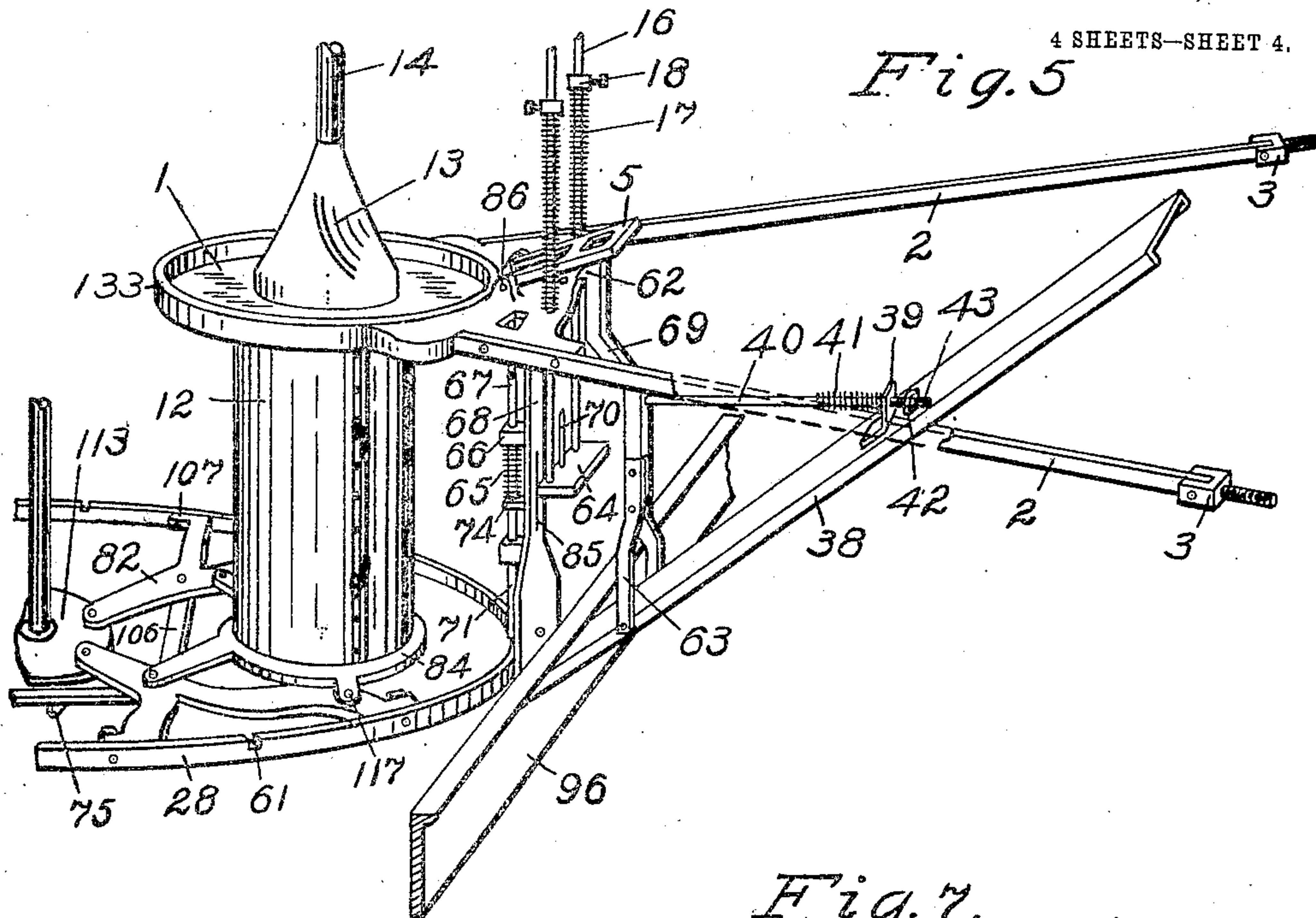


Fig. 6.

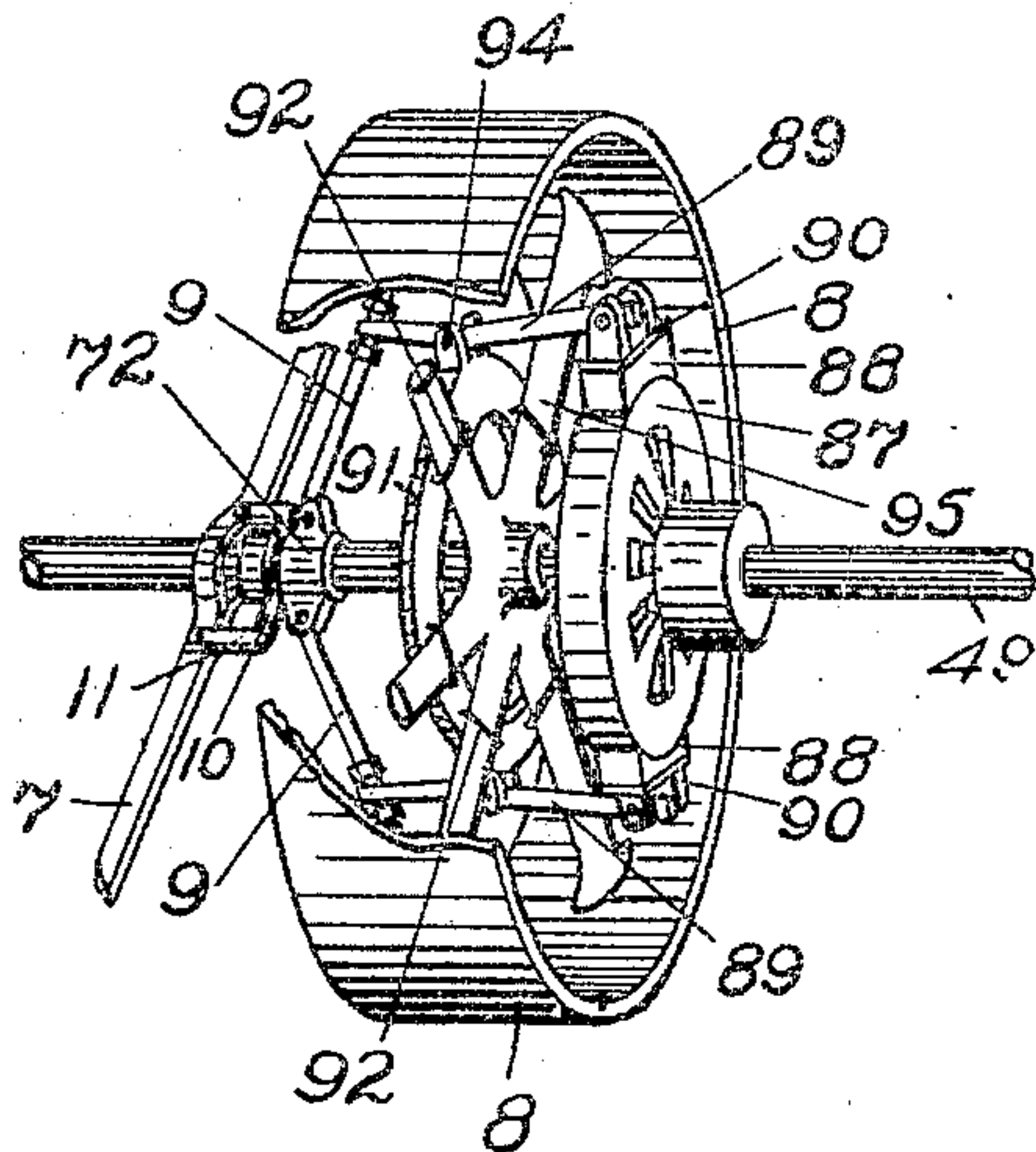
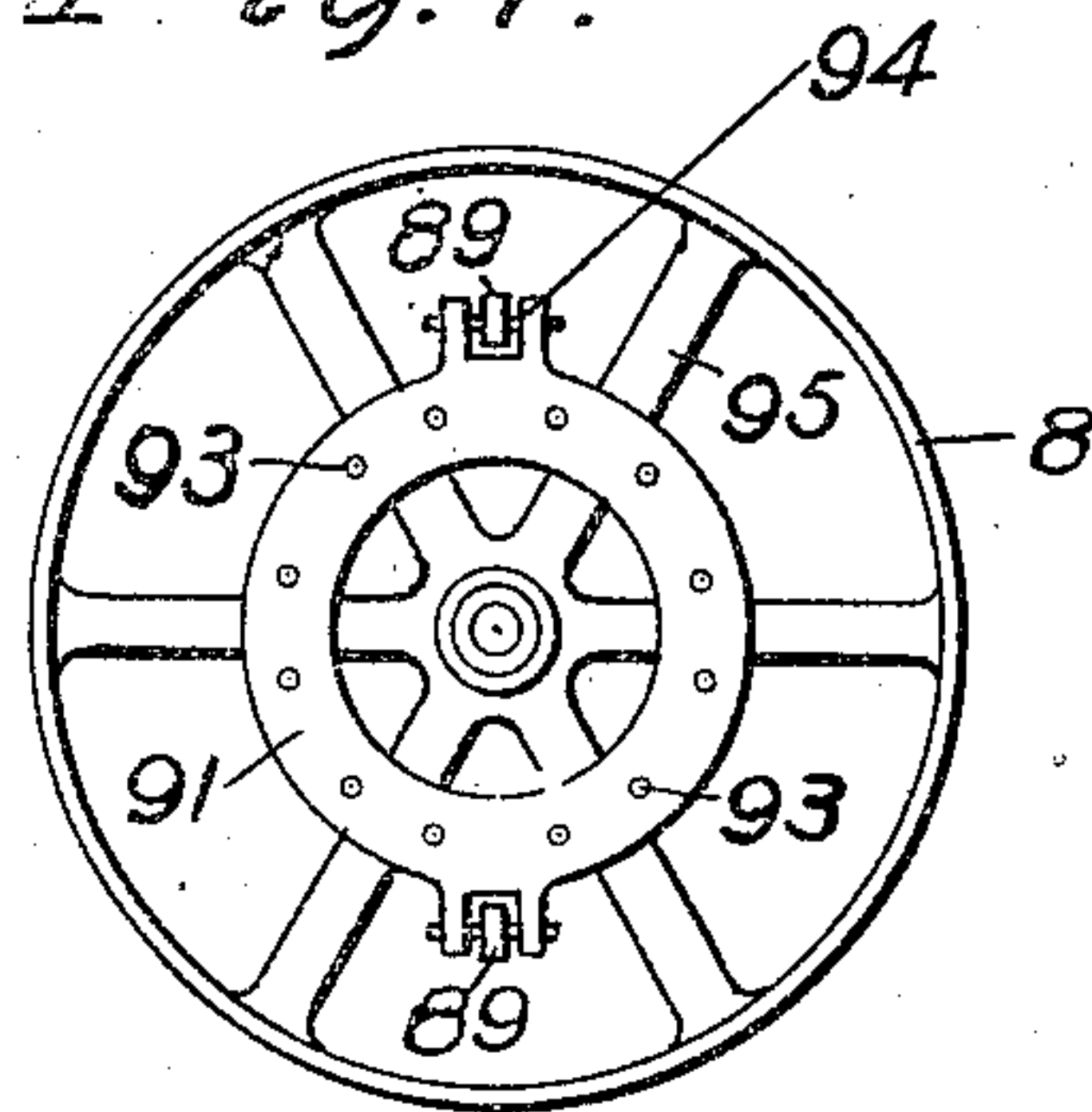


Fig. 7.



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UNITED STATES PATENT OFFICE.

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TILE-MACHINE.

No. 908,611.

Specification of Letters Patent.

Patented Jan. 5, 1909.

Application filed August 19, 1907. Serial No. 389,171.

To all whom it may concern:

Be it known that we, JOHN M. SCHENK and JOHN H. STEWART, citizens of the United States of America, and residents of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Tile-Machines, of which the following is a specification.

Our invention relates to improvements in tile machines, and the objects of our invention are, first, to provide improved resilient means for actuating the pivoted mold-cover; second, to furnish an improved resilient catch to hold the rotatable carriage in one position; third, to interpose a suitable friction-clutch mechanism on the power-shaft; fourth, to add to the machine suitable means for supplying successive portions of material to the tile-molds on the revolving carriage; fifth, to provide removable seats for the molds on said carriage in different dimensions.

Our said invention consists of the aforesaid improvements to the tile machine which was patented by the United States to John M. Schenk and Joseph Schenk, under Number 819,931, on May 8th, 1906.

These objects we have accomplished by the mechanism which is hereinafter fully described and claimed, and which is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our improved tile machine. Fig. 2 is a rear elevation thereof. Fig. 3 is a plan view thereof. Fig. 4 shows plan views of three removable mold-seats of different diameters. Fig. 5 is an enlarged detail perspective view of a part of the mechanism of the tile machine embodying the improvements to the pivoted mold-cover and the resilient engaging means for holding the rotatable carriage in one position. Fig. 6 is an enlarged detail perspective view of the friction-clutch on the power-shaft, parts being broken away from the band-wheel to more fully disclose the mechanism of the clutch. Fig. 7 is a front elevation on an enlarged scale of the pivot-bearing ring secured to the fronts of the spokes of said band-wheel. Fig. 8 is a detail perspective view of a portion of the mechanism embracing the actuating means for rotating the mold-carriage.

Similar numbers refer to similar parts throughout the several views.

Our improved machine has a supporting

frame composed of inwardly inclined uprights 4 affixed to the ends of parallel horizontal base timbers 114, and secured together at their front and rear upper ends by cross-timbers 101 and 100 respectively. Longitudinal timbers 97 are horizontally secured on each side to the said uprights, to support the bearings 102 of the cross-shaft 50. A cross-plate 131 connects the two front uprights 4, and supports the bracketed bearing 132 for the front end of the shaft 49. A cross-plate 99 connects the two rear uprights 4, and an upright 73 extends from it to the cross-beam 100 to support the rear end of the shaft 49 which passes through a bearing-opening in it. The numeral 96 denotes a cross-bar extending between and connected to the base-bars 114, and a bar 38 extends obliquely upward from the middle of 96 to the lower end of the upright 73.

The power-shaft 49 has on its front end a bevel-pinion 55 and on its rear end a worm 48. The bevel-pinion 55 intermeshes with the teeth of the bevel-gear-wheel 54, the latter being seated on the vertical shaft 14. The shaft 14 is slidable within said bevel-gear 54 but not rotatable within it, as said wheel rotates with said shaft by reason of the key 123 in the hub 122 of said wheel projecting into the groove 121 on said shaft. The gear-wheel 54 is supported by the bearing 116 resting on the bracket 115 connected to the cross-plate 131. The shaft 14 is caused to reciprocate vertically by means of a walking-beam or medially pivoted lever 15. The latter is pivoted on the cross-shaft 50, and its forward end has slotted bifurcations 19, which ride slidably over pins projecting laterally from the fixed sleeve 81 keyed at 20 to the shaft 14. The rear end of the walking-beam 15 has a friction roller 57 adapted to be moved over the cam 44 when the latter is rotated with the cross-shaft 46 on which it is secured. The cross-shaft 46 has its ends rotatably mounted in bearings 98 affixed to the uprights 4 at the rear, and on said shaft are mounted the gear-wheel 47 and the single-face cam-wheel 45. The gear-wheel 47 intermeshes with and is driven by the worm 48, while the cam-wheel 45 drives the friction-roller 56 on the upper end of the lever 36, the latter being medially pivoted in a bifurcated support 37 extending forwardly from the upright 4, and having its lower end pivoted to a bar slidably con-

nected to the arm 58, by means of pins 59
 in the latter moving in slots in the former.
 The mold-carriage 28, which is rotatable
 on a spindle 113 extending upward from a
 5 suitable base, has its central disk 130 con-
 nected to its circumferential plate-ring 28
 by means of the two-limbed pieces 82, whose
 ends are secured to said ring by bolts 107.
 A depending frame-work 106 is secured to
 10 the under sides of the pieces 82, and on the
 under side of said frame-work are depend-
 ing studs 75, in number the same as the
 regular divisions of the mold-carriage and
 spaced equidistantly apart. The inner side
 15 of the front end of the arm 58 is provided
 with an inwardly turned hook 124, adapted
 to engage one of the studs 75, when thrust
 forward and then drawn back by the action
 of the cam-wheel 45. A tension spring 125
 20 is connected between the forward end of the
 arm 58 and some fixed portion of the frame
 on the inner side of the arm, to assist in re-
 tracting said arm against the nearest stud 75.

Each of the pieces 82 has bolt-holes 118
 25 adapted to register with the bolt holes 117
 in the projecting arms 83 of the mold-seats
 84. As shown in Fig. 4, by this means mold-
 seats of various diameters may be substi-
 tuted for each other, when it is desired to
 30 change one set of molds of a certain diam-
 eter for another set of a greater or less di-
 mension. Each mold-seat has a circular
 flange in which is seated the mold 12. The
 former-head 13 on the lower end of the shaft
 35 14 is adapted to fit within the mold 12, and
 be spaced away from the mold's inner pe-
 riphery to a distance equal to that of the
 desired thickness of the tile to be formed
 therebetween. To keep the mold in position
 40 during the operation of molding the tile
 therein, a mold-cover 1 is provided, which
 has a central opening large enough to allow
 the former-head 13 to pass therethrough.
 The mold-cover is of greater diameter than
 45 the mold, and has a raised rim 133, the lat-
 ter being useful to prevent escape of the tile
 material, when the mold is being filled. The
 mold-cover 1 is attached to the long arms 2,
 which extend backward and are pivoted in
 50 bearings 3 secured to the rear uprights 4.
 These arms may be elevated to lift the mold-
 cover 1 away from the mold when it is de-
 sired to remove the mold with the formed
 tile therein, by the following means.

55 The numeral 16 indicates parallel vertical
 rods whose upper ends are pivotally con-
 nected to the forward end of the walking-
 beam 15, and whose lower ends after passing
 through orifices in the backward extension
 60 of the mold-cover 1 are connected and se-
 cured together by a cross-plate 64, the latter
 having the greater part of its width extend-
 ing rearwardly from said rods. Placed in-
 termediately between the rods 16 and fixed
 65 to the same cross-plate 64 is an upwardly

projecting pin 70, adapted to pass through
 an orifice in the said extension of 1, when
 the rods 16 are elevated to their higher po-
 sition. On the top of said extension are
 bearing lugs 86, in which are pivoted the 70
 pintles of the forward end of a plate 5, near
 whose rear end is a rectangular opening
 adapted to receive and be engaged by the
 hooked end 62 of the clutch-bar 69 whose
 lower end 63 is bifurcated and pivotally con- 75
 nected to the brace 38. The clutch-bar 69
 has its upper portion bent obliquely forward
 and then again bent vertically upward for
 a purpose to be described. Said clutch-bar
 also has a rod 40 projecting rearwardly and 80
 whose rear end is threaded and passes
 through an orifice in an angle-plate 39 se-
 cured to said brace 38. A nut 42 is secured
 on the end 43 of the bar 40, to adjust the
 latter's rearward play, while between a fixed 85
 ring 126 on the said bar 40 and the angle-
 plate 39 is placed a coiled compression
 spring 41, adapted to exercise a resilient
 pressure forward on the bar 69. On each
 of the rods 16 above the extension of 1 is 90
 secured a ring 18 by set-screws, and be-
 tween each ring 18 and the top of said ex-
 tension a compression spring 17 is placed
 and adapted to exercise a downward resili-
 ent pressure upon said extension when the 95
 latter is in its lowermost position and the
 rods 16 are also pushed down by the lower-
 ing of the front end of the walking-beam 15.
 When the forward end of said walking-beam
 15 is elevated it carries upward the rods 16, 100
 until the pin 70 passes through the orifice
 provided for it in said extension of 1, and
 the said pin then contacts with the under
 side of the plate 5 and lifts the latter at the
 instant that the rising rear edge of the cross- 105
 plate 64 has contacted with the oblique edge
 of the bar 69 and pushed its hook 62 back
 from the forward edge of the rectangular
 opening in the plate 5. The further ascent
 of the cross-plate 64 brings it into contact 110
 with the under side of the extension of 1, so
 that the latter is lifted a proper distance to
 uncover the mold 12, so that the latter may
 be carried around with the mold-carriage
 28, and another mold be brought about to 115
 the filling position. When the forward end
 of the walking-beam 15 is lowered, the re-
 verse action takes place, the rods 16 descend,
 disengaging the pin 70, and the plate 5
 drops so that its rectangular opening passes 120
 over the hooked end 62 of the bar 69 and
 thus becomes again engaged to hold down
 the cover 1 upon the tile-mold 12 until the
 latter is filled and the tile formed therein.

In order to secure the mold-carriage 125
 against movement during the time that a
 tile is being formed in the mold, we have
 provided the following improved engaging
 removable means. At certain equidistantly
 placed locations in the upper edge of the 130

plate-ring 28, equal in number to the mold spaces in said carriage, are placed transverse notches 61 adapted to be engaged by a reciprocatory plunger 71. The plunger 71 is slidable through perforated lugs 66 on the front face of an upright 68 secured to the cross-beam 96, and its upper end is pivotally connected to a downwardly projecting pin 67 attached to the lower side of the extension of the cover 1.

A cross-head 74 connected to the plunger 71 between the lugs 66 has its rear end arranged to slide in a slot 85 in the upright 68 to prevent displacement of said plunger, and a compression spring 65 is placed between said cross-head and the upper lug 66 to exercise a resilient stress downward upon said plunger. When the mold-cover 1 descends, the plunger 71 also drops its lower end into one of the notches 61 and secures the mold-carriage 28 in one position, until the operation of the machine causes the mold-cover to lift, when said plunger becomes disengaged from the notch long enough to permit the mold-carriage to rotate to the extent of one of its subdivisions.

When the forward part of the walking-beam 15 descends, it lowers the vertical shaft 14, with its rotating former-head 13 so that the latter passes into the mold 12 thereunder, and said former-head which has an upwardly coned or bell-form with depressions on either side to engage and push around the tile-material, moves downward and then upward again through the extent of the mold with a continuous spiral movement, which forces the tile-material against the inner periphery of the mold and forms a tile when the tile is so formed and the former-head in its upward movement has cleared the mold-cover 1 for a sufficient space, the mold-cover rises, and the plunger 71 becoming disengaged from the mold-carriage, the latter rotates through the space of one of its subdivisions. The mold with the formed tile therein may then be lifted off said carriage, and another mold has in said movement been brought into the proper position for filling with cement.

The part of the machine employed to fill the molds with the tile-material is made and used as follows: Set in bearings 103 on the cross-beams 100 and 101, is a rotatable shaft 77 whose forward end projects over the carriage 28 and is supported by a bracket 52. A parallel shaft 25 is rotatably mounted in the bearings 108 on the same cross-beams, and has thereon a sprocket-wheel 22, a sprocket-chain 24 passing over it and the sprocket-wheel 23 on the power-shaft 49. A pinion 76 is mounted on the shaft 25 and intermeshes with a gear-wheel 21 on the shaft 77. By these means the shaft 77 is rotated, with its sprocket-wheels 26 on its forward end. A shaft 111 is journaled in

the ends of the yoke 32 at the front of the machine, and on this shaft are mounted the sprocket-wheels 27, the upper part of said yoke being seated on a rod 30, whose lower end is threaded at 34. The bifurcations of said yoke are connected by a cross-brace 112 through which the threaded end of the rod 30 works, and an adjusting nut being secured on said rod below said brace whereby the distance of the shafts 77 and 111 may be adjusted apart. The yoke members are also braced to the bar 112 by adjustable members 33. Sprocket-chains 31 pass about the sprocket-wheels 26 and 27. A single bucket 78 is suspended from the sprocket-chains 31, and the length of the chains is such that they are adapted to make one revolution and empty one bucketful of cement scooped from the receptacle 79 into the upper opening of the filling-cone 53 whenever a mold 12 moves into its filling position on the mold-carriage 28.

We have inserted in our improved machine, a friction-clutch described as follows. On the power-shaft 49 a disk 87 is fixed near the band-wheel 8, the latter being slidable on said shaft. To the spokes of said band-wheel a ring 91 is secured by means of loops 92 passed about said spokes and having their ends clenched into the holes 93 in said ring. The ring 91 has a bearing 94 on each side for the levers 89, the rear ends of said levers having pivoted thereto the boxes 90 having wooden friction blocks 88 adapted to come in contact with the circumferential edge of the disk 87. To the other ends of the levers 89 are pivoted links 9, the latter pivoted to a collar 72 slidable on said shaft and having a forward concentrically grooved hub, and into said groove 10 are projected the inwardly bent ends of the claws 11 attached to the lever 7. The said lever 7 is pivoted to one of the side-timbers 97. The lower end of the said lever is pivoted to a slide-bar 6 which is slidable within a loop attached to the forward upright 4 on the opposite side of the machine from the timber 97 to which the upper end of the lever 7 is pivoted. By means of this slide-bar, the lever 7 may be shifted so as to cause the slidable sleeve 72 to throw in or out the forward ends of the levers 89 so as to either make the wooden friction-blocks 88 engage the edge of the disk 87 or to be released therefrom. Thus the machine can be thrown in or out of operative relation to the power-wheel 8 as desired.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is:—

1. In a tile machine, in combination, a mold, means for transporting said mold to a different location, a hinged element adapted to engage the top of the mold, means for raising and lowering said hinged

element, slide-rods connected to said means having engaging-means on their lower ends under said element adapted to contact with and lift said element when raised to a certain distance, and resilient means connected with said rods and bearing against the top of said element and adapted to resiliently hold said element upon said mold when in its lowermost position.

2. In a tile machine, in combination, a mold, a movable carrier for said mold, a hinged element adapted to contact with the upper edge of said mold when lowered, means for raising and lowering said element, rods connected to said means and slidable through apertures in said element, a cross-bar connecting the lower ends of said rods below said element and adapted to contact with and lift said element when said rods have been elevated a certain distance, engaging means pivoted on said hinged element, a fixed support, a swing-arm pivoted to said fixed support and having one end formed to removably engage and hold said engaging means when said element is in its lowered position only, resilient means connected between said fixed support and said swing-arm adapted to keep the latter in contact with said engaging means, and a projection on said cross-bar adapted to contact with said engaging means and to break the connection between such means and said swing-arm when said cross-bar has been elevated to a certain distance.

Signed at Waterloo, Iowa, this 31st day of July, 1907.

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JOHN H. STEWART.

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HOWARD SHARP.