

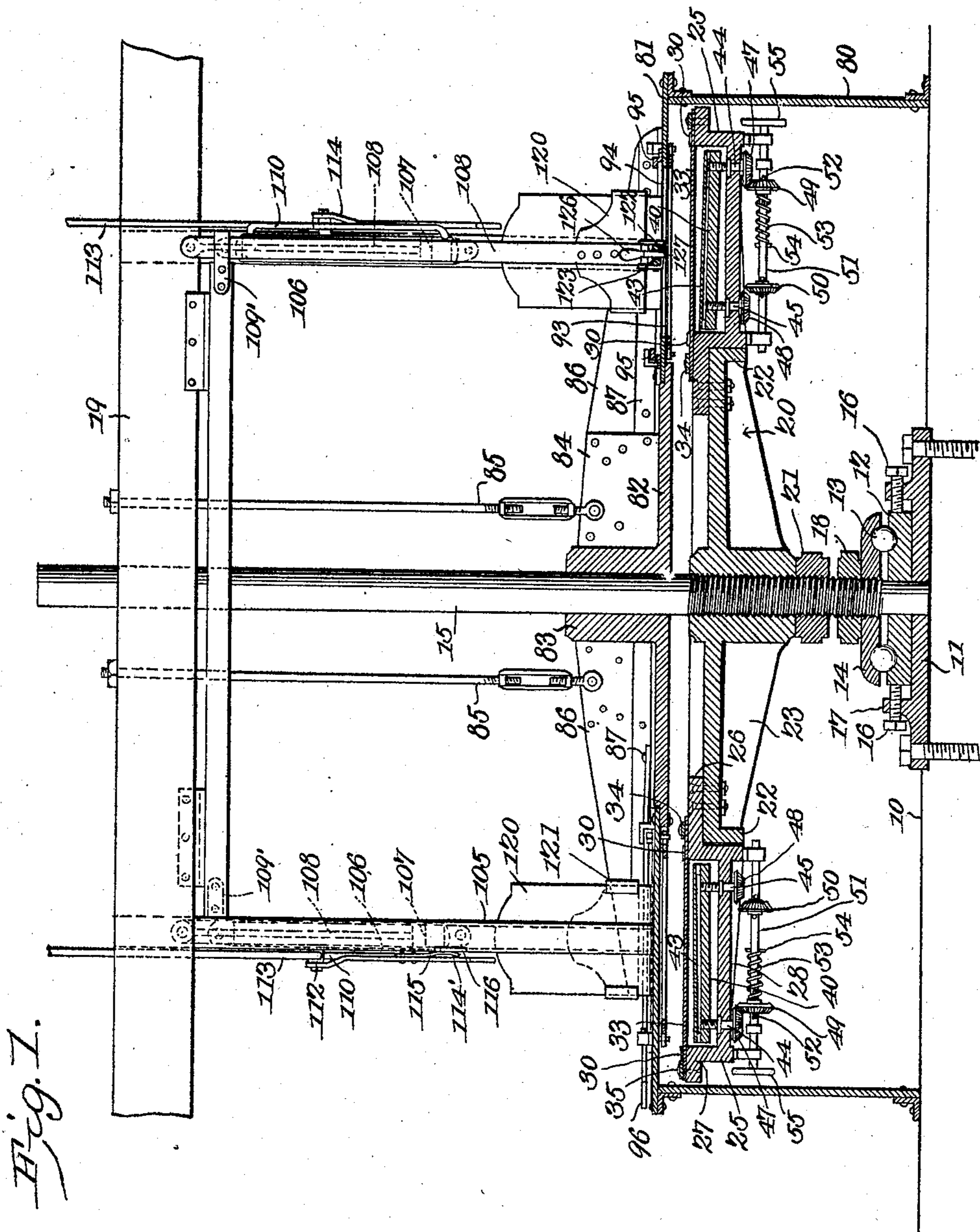
No. 824,168.

PATENTED JUNE 26, 1906.

D. F. BAKER.
SHINGLE MACHINE.

APPLICATION FILED SEPT. 15, 1905.

5 SHEETS—SHEET 1.



Witnesses
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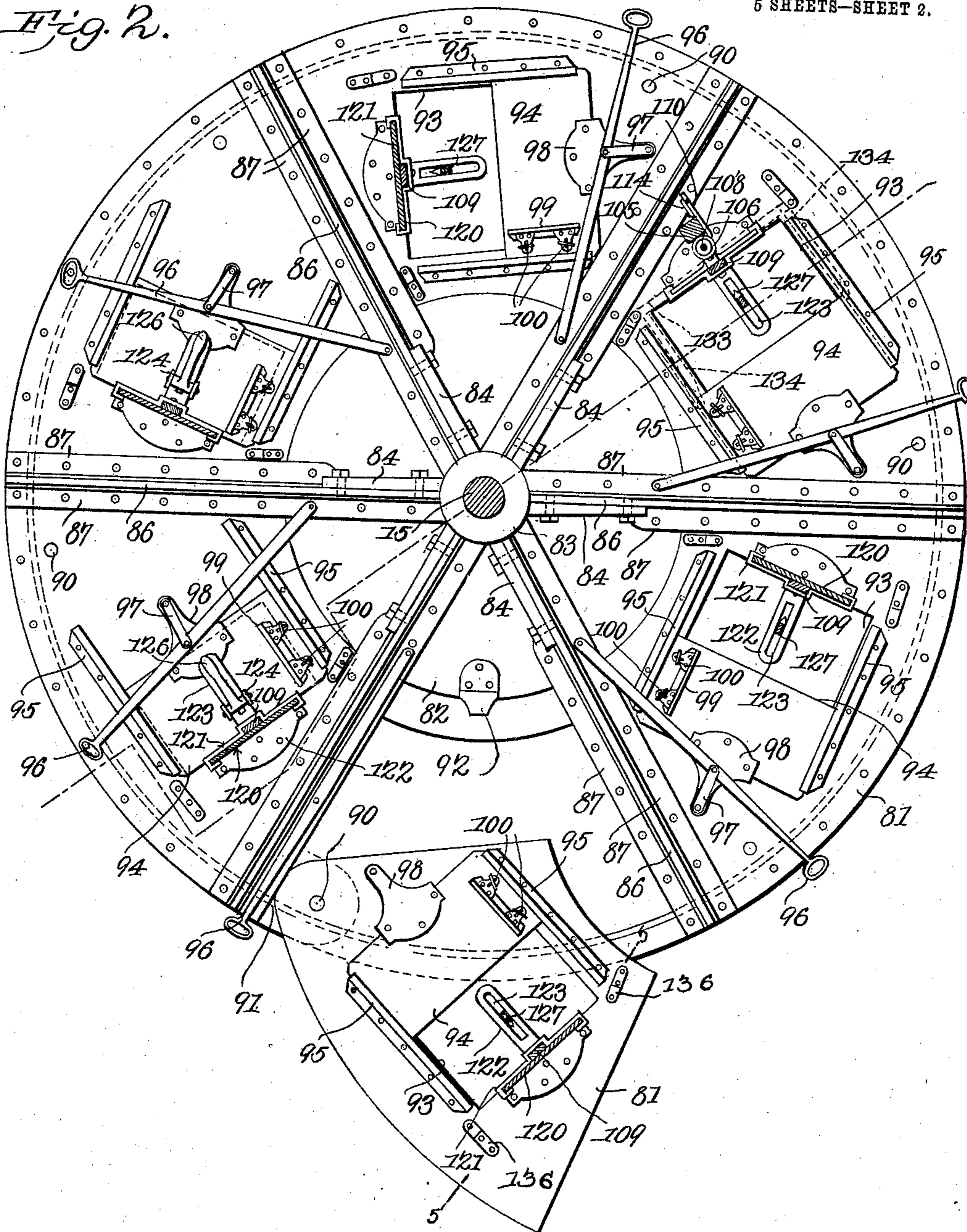
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5 SHEETS—SHEET 2.

Fig. 2.



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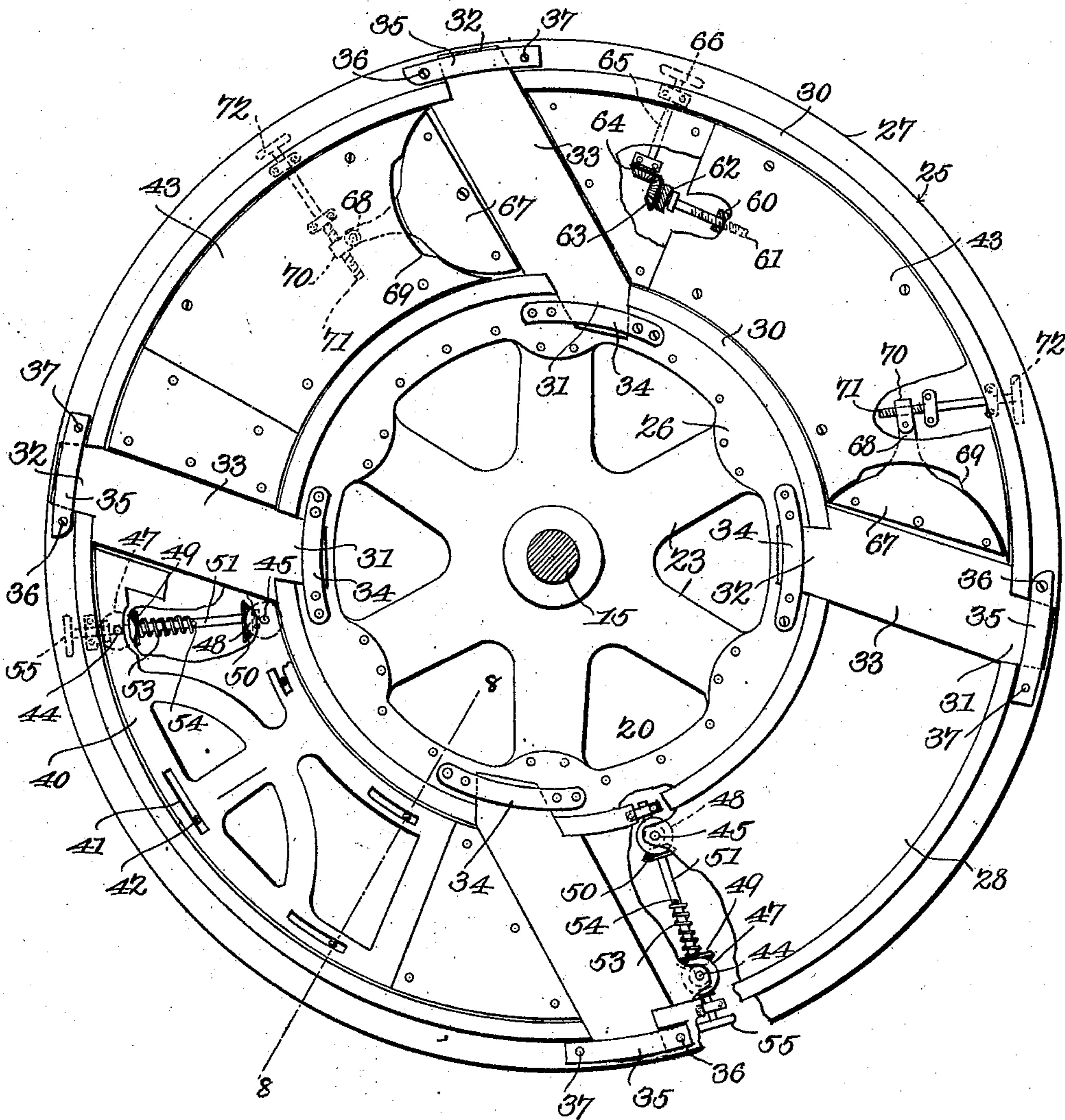
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5 SHEETS—SHEET 3.

Fig. 3.



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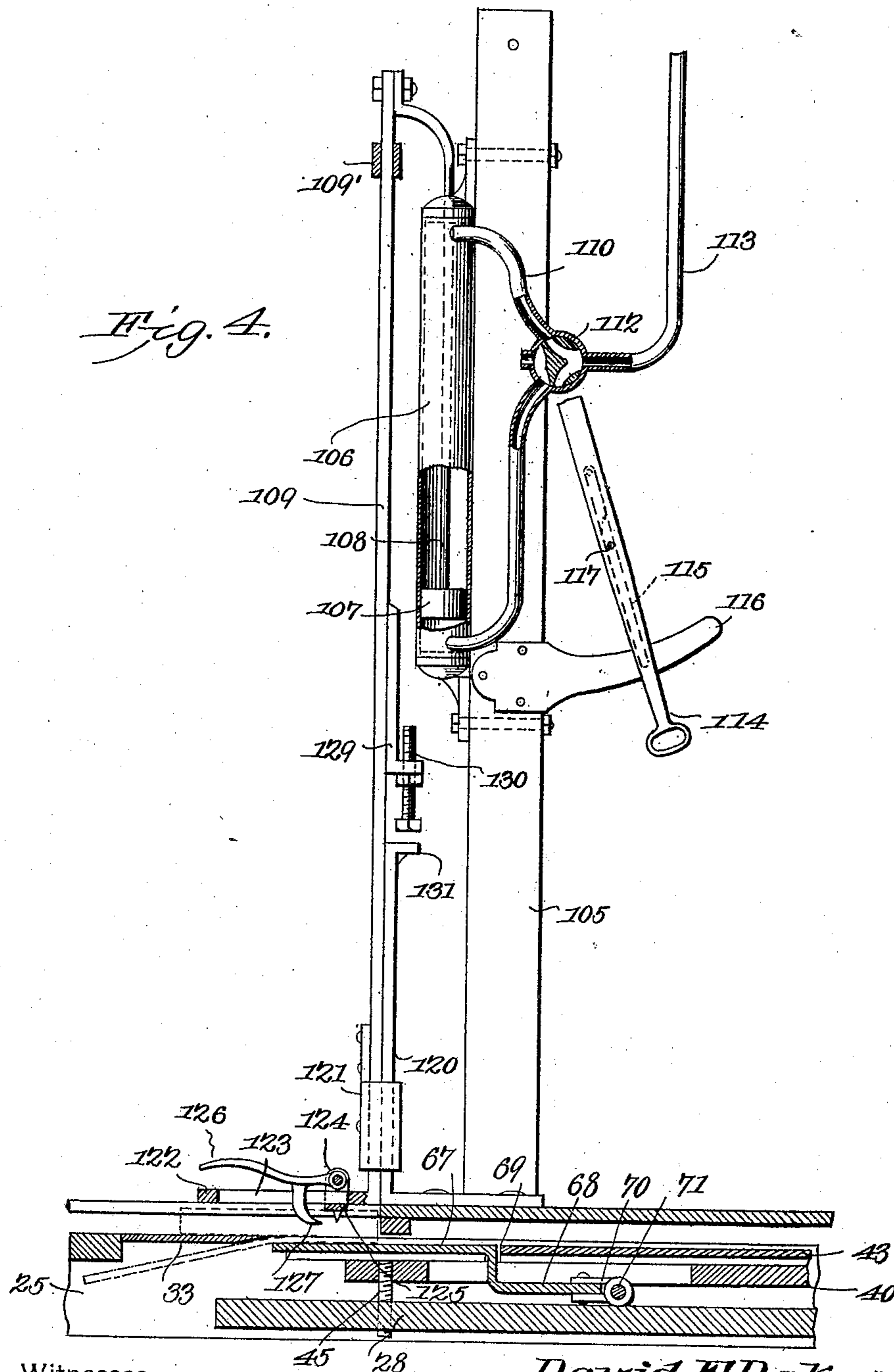
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5 SHEETS—SHEET 5.

Fig. 5.

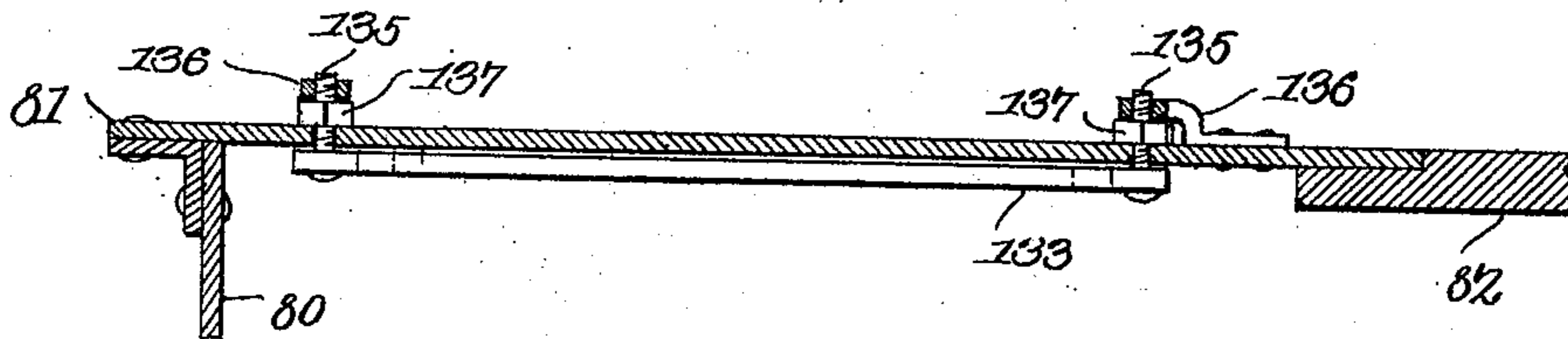


Fig. 6.

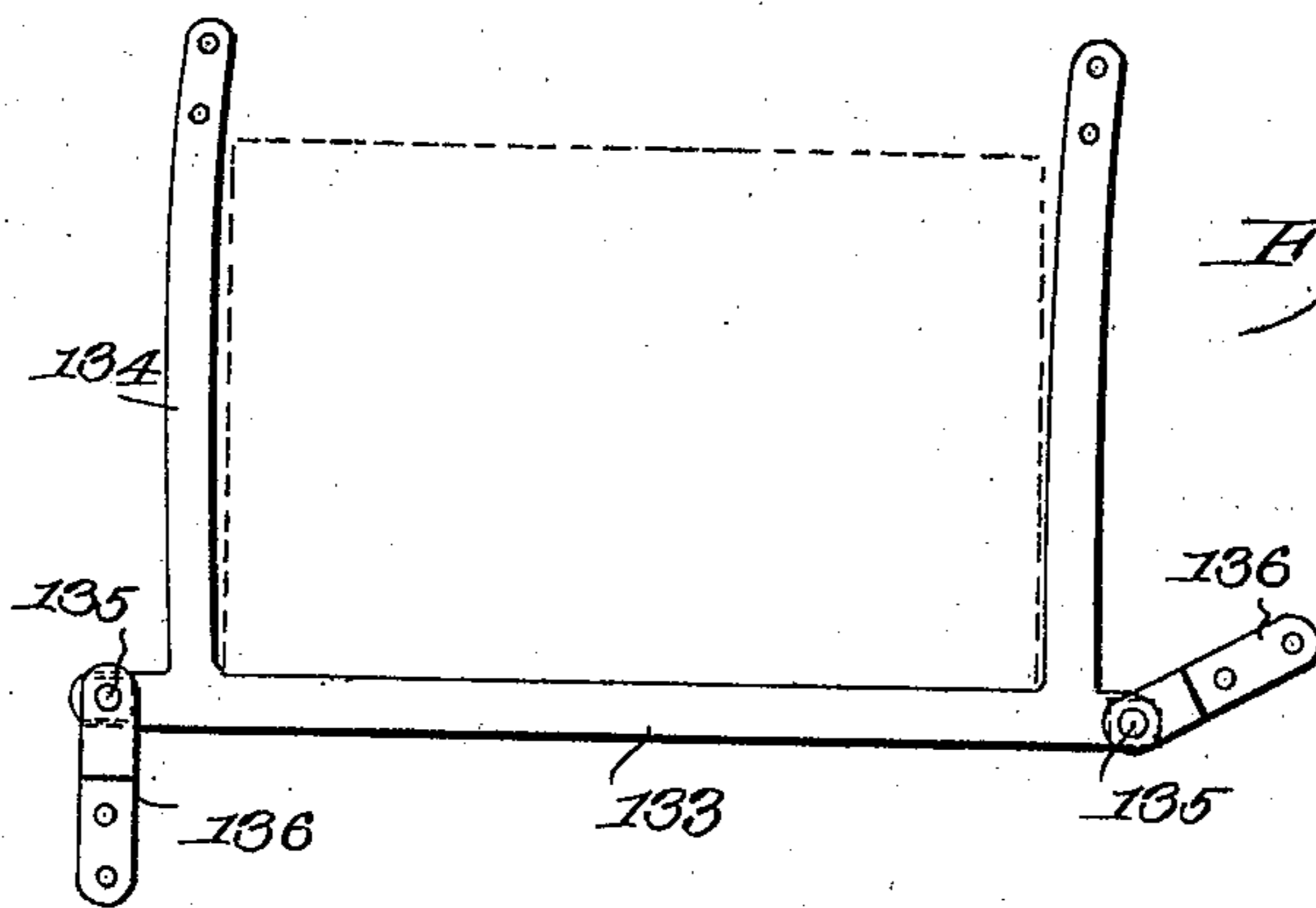


Fig. 7.

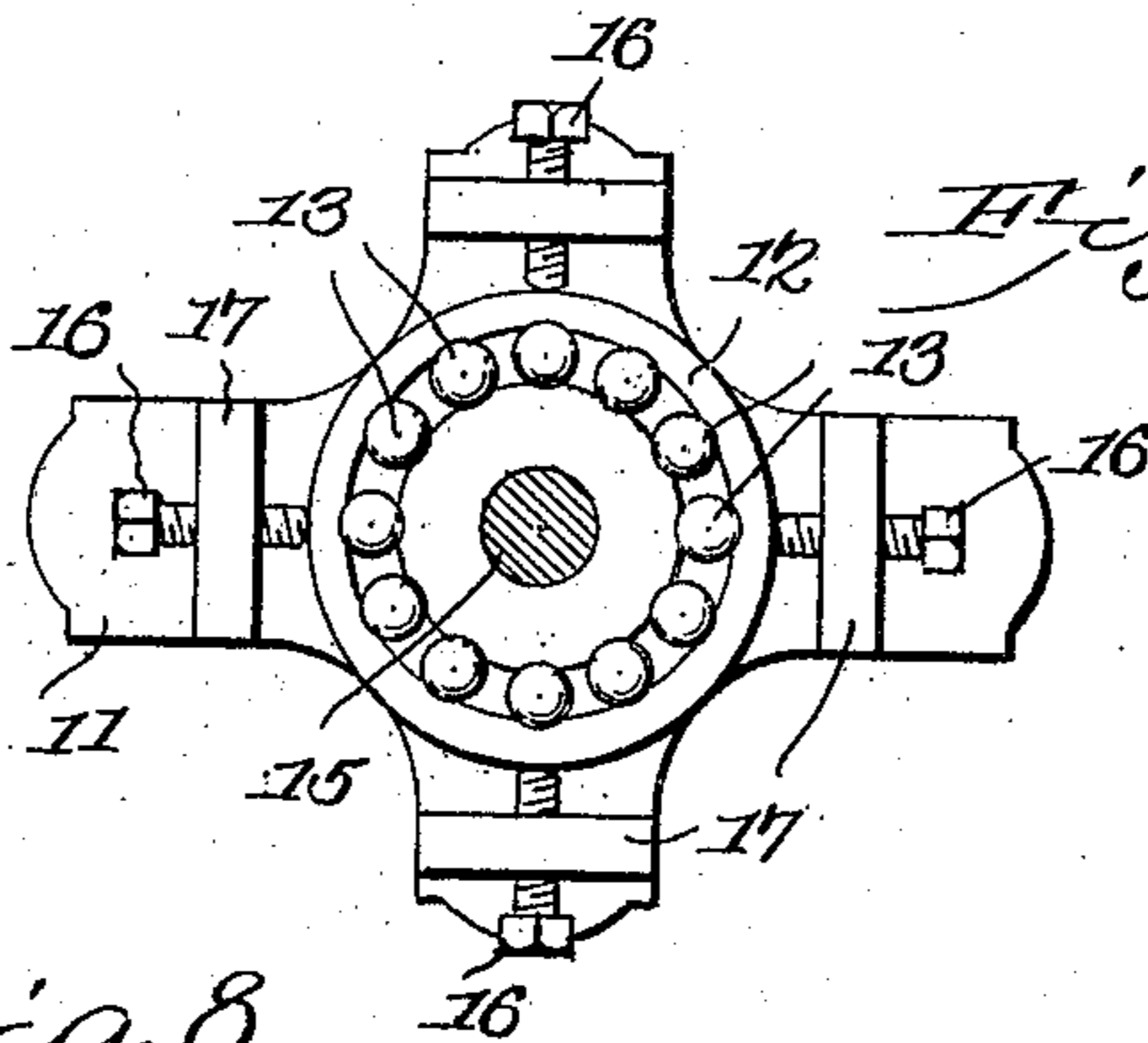
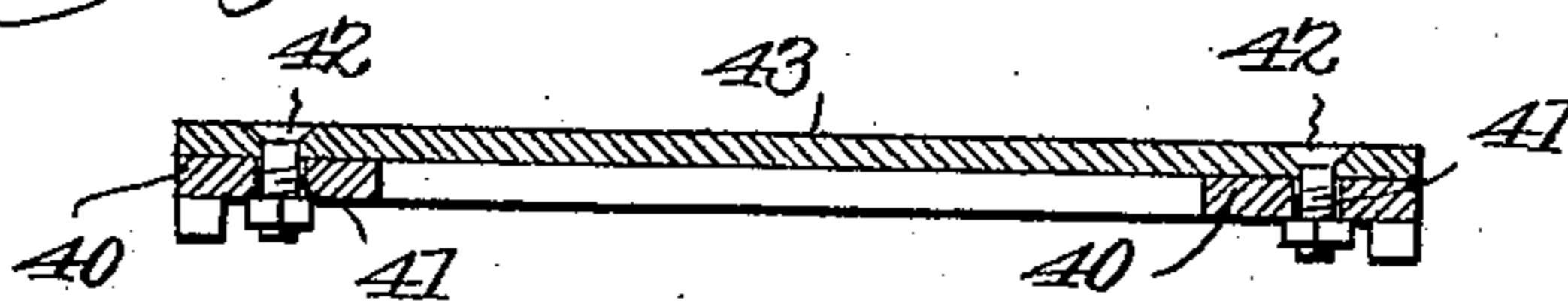


Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID F. BAKER, OF DUNDEE, OREGON.

SHINGLE-MACHINE.

No. 824,168.

Specification of Letters Patent.

Patented June 26, 1906.

Application filed September 15, 1905. Serial No. 278,640.

To all whom it may concern:

Be it known that I, DAVID F. BAKER, a citizen of the United States, residing at Dundee, in the county of Yamhill and State of Oregon, have invented a new and useful Shingle-Machine, of which the following is a specification.

This invention relates to machines for manufacturing shingles and similar articles; and its principal object is to provide a mechanism of simple construction by means of which shingles, fruit-box blanks, and the like may be manufactured very rapidly and without waste of material.

A further object of the invention is to improve and simplify the construction of machines of that general class in which a block or blocks of wood are fed toward a plurality of revolving knives by providing means for placing fresh blocks of wood in position while the cutters are working and by providing means for accurately adjusting the positions of the knives and the block-guides by which the blocks are supported in advance of the knives.

A still further object of the invention is to provide a shingle-machine including a block-feeding mechanism and a plurality of knives, alternate knives being inclined in opposite directions, respectively, in order that the butt or thicker edge of the shingle may be cut from one edge of the block and then from the opposite edge of the block.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a vertical section of a shingle-machine constructed in accordance with the invention. Fig. 2 is a plan view of the same, showing the movable section of the cover in open position. Fig. 3 is a plan view of the cutter head or carrier, parts being broken away in order to more clearly illustrate the construction. Fig. 4 is an elevation, partly in section, showing one of the block-feeding mechanisms and illustrating also the operation of one of the

cutters. Fig. 5 is a detail sectional view on the line 5 5 of Fig. 2, showing one of the backing-bars. Fig. 6 is a plan view of one of the backing-bars detached. Fig. 7 is a plan view of the lower bearing for the cutter-shaft. Fig. 8 is a detail sectional view on the line 8 8 of Fig. 3.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The lower portion of the machine is supported on a suitable base 10 of any desired character, and to the base is secured a bed-plate 11, carrying a disk 12, provided with an annular ball-race for the reception of anti-friction-balls 13, and on the balls runs a disk 14, to which is secured the lower threaded end of a vertical shaft 15. Provision is made for centering this shaft, and this in the present instance is accomplished by the employment of screws 16, extending through threaded openings formed in lugs 17, carried by the base-plate, the inner ends of the screws bearing against the disk 12. The shaft is locked in adjusted position with respect to the disk 14 by a suitable lock-nut 18, and the upper end of said shaft finds a bearing in a suitable overhead frame 19.

To the lower portion of the shaft is secured a revoluble knife-carrier 20, having a threaded hub, which is screwed on the threaded portion of the shaft and is held in position by a lock-nut 21. The revoluble carrier 20 is arranged for the support of a plurality of cutting-knives, which act successively on blocks fed thereagainst by suitable mechanism, the machine in the present case being provided with four cutting-knives and six block-feeders, so that each revolution of the cutter-carrier 20 results in the formation of twenty-four cuts or slices. The cutter-carrier comprises a central circular frame having a peripheral flange 22 and provided with webbed spokes 23, and to the outer portion of this central disk is secured an annular knife-carrier 25, the inner edge of which is provided with an annular flange 26, fitting over flange 22 and secured thereto by bolts or similar fastenings. At the outer edge of the carrier 25 is a flange 27, and the two flanges 26 and 27 are connected by a web 28, that is arranged some distance below the top of the flanges, forming a continuous annular space for the reception of the cutting-knives and the adjustable block-guides.

On each of the flanges 26 and 27 is formed

a small vertically-extending flange 30, and these flanges are each cut away to form recesses for the reception of the opposite ends 31 and 32 of the cutting-knives 33, the end portions of the knives being reduced in width so that the length of the blade proper will occupy the full space between the two flanges and the opposite end portions thereof will bear against the inner faces of the flanges. The inner end of each knife passes under a strap 34, that is rigidly secured in place, and the outer end passes under a strap 35, one end of which is pivoted at 36, while the opposite end is held in place by a bolt 37. By removing this latter bolt the strap 35 may be swung outward and the inner end of the knife may be withdrawn from under the strap 34.

It will be seen on reference to Fig. 3 that four knives are used in the present instance, and these knives are all so arranged that their cutting edges fall on non-radial lines. In one pair of diametrically-opposed knives the advance cutting ends are adjacent the inner flange 26, while the advance ends of the opposite pair of cutting-knives are adjacent the outer flanges 27. As the result of this the shear cuts from the block will be first in one direction and then in the opposite direction as the knives successively engage with said block and liability of splitting is materially reduced.

The knives are fixed, and adjustment as to thickness of cut and the bevel or angle of the article manufactured are accomplished by providing suitable adjusting mechanisms for the supports between the knives on which the blocks rest between cutting operations. Between each two knives is arranged a segmental frame or plate 40, that is provided with a plurality of slots 41 for the passage of bolts 42, by which said frame is secured to an upper plate 43, that is adjustable circumferentially of the cutter-carrier, the slots permitting such adjustment and the bolts serving to lock the plate in adjusted position, so that the distance between the end of the plate and the cutting edge of the knife may be accurately adjusted. The block to be cut rests on this plate 43, and if the top of the plate is in parallel relation with the cutting edge a strip of uniform thickness will be cut from the block. It is desirable, however, in the cutting of shingles to adjust the plate to a position at a slight angle to the cutting edge of the knife, so that the space between the two will correspond to the shape of the shingle. To effect this adjustment, the web 28 is provided with bearing-openings for the passage of two short shafts 44 and 45, that are held from longitudinal movement, and on said shafts are formed screw-threads which engage with threaded openings in the frame 40.

The shafts extend below the web 28 and

are provided with bevel-gears 47 and 48, respectively, and with these bevel-gears engage bevel-gears 49 and 50, both of which are mounted on a shaft 51, adapted to suitable bearings depending from the carrier. The bevel-gears 47 and 49 are constantly in mesh, said gear 48 being held to the shaft by a feather 52 and being pressed into engagement with the gear 48 by a spring 53, coiled around the shaft and having one end bearing against a pin 54, projecting from said shaft. The opposite gear 50 is rigid on the shaft and is so arranged that when the shaft is pulled outward by means of its operating-handle 55 the gear 50 will be disconnected from the gear 48, while the gears 47 and 49 will remain in mesh and may be turned without turning the gear 48. It will be seen that if all of the gears are meshing and handle 55 is turned, the frame 40 will be moved up and will be maintained in parallel relation with the edge of the knife, and during the first adjustment of the parts all the gears are held in mesh and the frame 40 is moved either up or down until it arrives at the proper level. If the article to be cut is to be thicker at one edge than at the other, the handle 55 is pulled outward and gear 50 is moved from mesh with the gear 48, while on further turning of the shaft the gear 47 will be turned and the outer edge of the frame 40 will be further raised or lowered, as desired. It will be seen on reference to Fig. 2 that this adjustment has been accomplished by lowering the outer edges of the frames.

In order to adjust the plate 43 circumferentially of the cutter-carrier, one end of the plate is provided with a depending lug 60, having a threaded opening for the reception of a threaded shaft 61, that passes through a suitable lug 62 of the frame 50. This shaft is provided with a bevel-gear 63, intermeshing with a gear 64 on a shaft 65, that extends to the outer edge of the frame and is provided with an operating-handle 66. By turning this handle the supporting-plate 43 may be moved toward or from its cutter.

Owing to the necessity for frequent sharpening of the knives, it is difficult to secure the necessary parallelism between the cutting edge of the knife and the adjacent end of the plate 43, and to compensate for this wearing away of the knife an auxiliary segmental plate 67 is arranged in a recess formed in the upper face of the plate 43, the upper surfaces of the two plates being flush. The plate 67 is provided with a rearwardly-extending arm 68, extending through a suitable opening 69 on the plate 43, and to said arm is pivoted a nut 70, arranged for the reception of a screw 71, that extends to the outer edge of the frame and is provided with an operating-handle 72. By turning this handle the edge of the segmental plate 67 may be adjusted into parallel relation with the cutting edge, and thus compensate for the wearing away of the cut-

ter from the grinding and sharpening operations.

Extending around the cutter is a circular casing 80, at the top of which is secured the outer edge of an annular plate 81, the inner edge of which is secured in an annular groove at the periphery of a disk 82, having a central hub 83, through which the shaft 15 extends. Extending from this hub member is a series of short radial ribs 84, to a number of which are connected adjustable suspension-rods 85, the upper ends of the latter being secured to the cross-beam or frame 19. Bolted or otherwise secured to the ribs 84 are radial ribs 86, and to the lower edges of these are bolted angle-bars 87. The annular cover-plate 81 is formed of segments that are bolted to angle-bars 87, and one of these segments, together with a corresponding portion of the outer casing 80, is pivoted on a pin 90, carried by a suitable bracket 91, projecting from one of the ribs, so that the hollow section may be swung outward, as shown in Fig. 2, to permit access to the knives and the various devices for adjusting the positions of the block-rests. When swung back into place, the inner edge of the cover-segment fits within the annular groove at the periphery of the disk 82 and is partly confined in place by a clip 92, a number of bolts being preferably added between the free end of the segment and the adjacent angle-bar 87 in order to firmly hold said segment in place.

Each of the segments is provided with a block-carrier and with an opening through which a block may be inserted and held in the path of movement of the knives. Each opening 93 may be closed by a slidable cover-plate 94, the edges of which fit within suitable guides 95, secured to the upper face of the segment, and these covers are moved to and fro by handled levers 96, pivoted at their inner ends to the angle-bars and connected by links 97 to brackets 98, projecting from the rear edges of the covers. On top of each cover is arranged an adjustable guiding or centering strip 99, which may be adjusted with respect to the cover and locked in position by suitable thumb-screws 100 or other securing devices. This guide is intended for use in properly adjusting the position of the block being cut with respect to the knives, and in use the cover is first moved to closed position, and after the guide 99 has been properly adjusted the block is placed on the cover with one end resting against the guide, after which the block gripping or clamping members are engaged with the block, and the cover is then moved to open position, allowing the block to drop down through the opening in the path of movement of the cutting-knives.

Arranged above each segment is a vertically-disposed post or standard 105, that is provided with suitable supports for a verti-

cally-arranged cylinder 106, containing a piston 107, and to the piston is secured a rod 108, that extends out through the upper end of the cylinder and is secured to the upper end of a presser-bar 109, that extends through suitable guides carried by a stationary ring 109'. The upper and lower ends of the cylinder are connected by pipes 110 to a casing containing a valve 112, and said casing is also in communication with a fluid-pressure-supply pipe 113, through which steam, air, or other fluid under pressure may be forced. The stem of the valve 112 is provided with an adjusting operating-lever 114, carrying a spring 115, which rests frictionally against a rigid segment 116, and the stress of the spring may be adjusted by means of a screw 117. This lever may be adjusted to any position for the purpose of controlling the flow of the fluid to either end of the cylinder and the exhaust from the opposite end and to increase or decrease the effective area of the inlet-port in accordance with the pressure to be exerted on the block. When so adjusted, the spring 115, bearing against segment 116, will hold the lever in position.

Secured to each segment at a point adjacent to the rear wall of the opening therein is a standard 120, against which the rear face of the presser-bar 109 slides, and to said presser-bar is secured a guide-plate 121, the opposite edges of which are bent to embrace the edges of the standard 120. The lower end of the presser-bar is provided with a horizontally-extended foot-piece 122, having an elongated slot 123. Mounted on the foot-piece is a slide-block 124, having spurs or teeth 125 for engagement with the upper surface of the block. Pivoted to the block 124 is a lever 126, carrying an adjustable tooth or spur 127, that is also arranged to engage with the block, the spur being driven into the block by downward pressure exerted on the lever and serving in connection with the spurs 125 to firmly hold the block to the presser-foot, so that by raising the presser-foot the block may be lifted from cutting position, it being merely necessary to turn the operating-lever 114 in order to admit the steam or air to the lower portion of the cylinder 106. In order to prevent injury to the knives or presser-bar, the rear face of the latter is provided with a bracket 129, carrying an adjustable stop in the form of a screw 130, that is arranged to engage a fixed stop 131, formed at the upper end of the standard 120. By this means the downward movement of the presser-foot is positively stopped before the block-engaging tongues or spurs reach the horizontal plane of the cutting-knives.

In order to take up the strain at the rear wall of each opening 93, an adjustable backing-bar 133 is arranged immediately under each segment at a point in vertical alinement with the rear wall of each opening 93. This

bar is provided with curved end members 134, which extend along the side walls of the opening 93 and are secured at their inner ends to the bottom of the segment. The opposite ends of the bar 133 are extended beyond the sides of the opening, and to each end is secured a vertically-extending screw 135, that passes through unthreaded openings in the segment and in brackets 136 immediately above and carried by said segment. Between the face of the segment and the bracket is a nut 137, surrounding the screw, and by turning this nut in one direction or the other the bar 133 may be raised or lowered to compensate for wear in other parts of the machine, the object being to place the bar as near the horizontal plane of the cutting edges as possible, so that splitting of the wood may be avoided.

In the operation of the machine, the parts having been previously adjusted in accordance with the character of the shingles or other articles to be manufactured, the several covers 94 are moved to closed position, the presser-foot having been previously raised. A block of wood is then placed against the guide 99 on cover 94, and the presser-foot is lowered until the arms or supports 125 are pressed firmly into the top of the block. The lever 126 is then depressed, and the tongue 127 is driven into the block with sufficient force to grip and hold the block in case the latter is to be raised. The cover is then moved from place, and the block is forced down into the path of the knives. As the knife-carrier revolves, each knife will act on each block once during each revolution, and in the machine illustrated, where four knives are employed in connection with six block-holders, a single revolution of the machine will result in the production of twenty-four shingles or similar articles.

Having thus described the invention, what is claimed is—

1. The combination with a block-feeding means, of a revoluble cutter-head, a plurality of cutting-blades carried thereby, a frame carried by the cutter-head at a point between each two blades, screws connected to the frame, and serving to effect vertical adjustment thereof, bevel-gears carried by the screws, a shaft having a pair of bevel-gears intermeshing with the gears of the screws, one of the gears of the shaft being loosely mounted to permit independent adjustment of one or other of said screws, and a block-supporting plate carried by said frame.

2. The combination with a block-feeding means, of a revoluble cutter-head, a plurality of cutting-blades carried thereby, an adjusting-plate carried by the cutter-head and forming a support for the block, said plate having a recessed end portion adjacent to the blade, and a segment arranged within the re-

cess and adjustable to a position parallel with the edge of the cutting-blade.

3. The combination with a block-feeding means, of a cutter-head, a cutting-blade carried thereby, a vertically-adjustable frame carried by the cutter-head, a plate mounted on said frame and adjustable in the direction of its length toward and from the cutter-blade, said plate having a curved recess at the end nearest the blade, a segment arranged within the recess, and means for adjusting said segment to present the edge thereof into parallel relation with the edge of the cutting-blade.

4. The combination with a block-feeding means, of a revoluble cutter-head, a casing extending over the same and having an opening for the passage of the block, and a door movable over the opening and serving as a means for supporting the block during the preliminary adjustment of the latter and its attachment to the feeding means.

5. The combination with a cutter-head, of a slidable plate extending over the cutter-head and provided with a guide for adjusting the position of the block to be cut, and a block-feeding means, the plate being movable from under the block to permit the passage of the latter into contact with the cutter-head.

6. The combination with a cutter-head, of a casing having an opening for the passage of a block to be cut, a door movable over said opening, said door having a block-centering guide, and a feeding means arranged to engage with the block and force the latter through the opening after movement of the door to open position.

7. The combination with a cutter-head, of a casing having an opening for the passage of a block, a block-backing bar arranged below the casing, means for vertically adjusting the bar, and arms extending forwardly of the bar and secured to the casing.

8. The combination with a cutter-head, of a casing having an opening for the passage of a block, a backing-bar arranged below the casing, arms extending from the opposite ends of said bar and secured to the casing, a pair of brackets carried by the casing, screws extending from the upper ends of the bar through openings in the casing, and brackets, and nuts arranged on the screws at points between the casing and brackets, and serving to adjust said backing-bar.

9. The combination with a revoluble cutter-head, of a casing including a central disk having ribs radiating from the center of rotation of the cutter-head, extension-ribs secured to the radiating ribs, angle-bars secured to said extension-ribs, segmental plates secured to the angle-bars and provided with openings for the passage of blocks to be cut, and a cylindrical casing, the upper portion of which is connected to the segments, one of said segments, together with its attached por-

tion of the cylindrical casing, being pivotally mounted and free to swing outward to expose the cutter-head.

10. The combination with a revoluble cutter-head, of a casing arranged above the cutter-head and having an opening for the passage of a block to be cut, a standard carried by the casing, a presser-bar guided by the standard, an adjustable stop carried by the bar and arranged to engage the standard, a slotted presser-foot carried by the bar, a block adjustable in the slot and having projecting spurs, a lever pivoted to said adjustable

block and provided with an auxiliary tooth or spur, a cylinder, a piston therein, a piston-rod connected to the presser-bar, a fluid-pressure-supply pipe, and a valve arranged therein and serving to control the flow of the fluid to both ends of the cylinder.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

DAVID F. BAKER.

Witnesses:

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