

No. 754,433.

PATENTED MAR. 15, 1904.

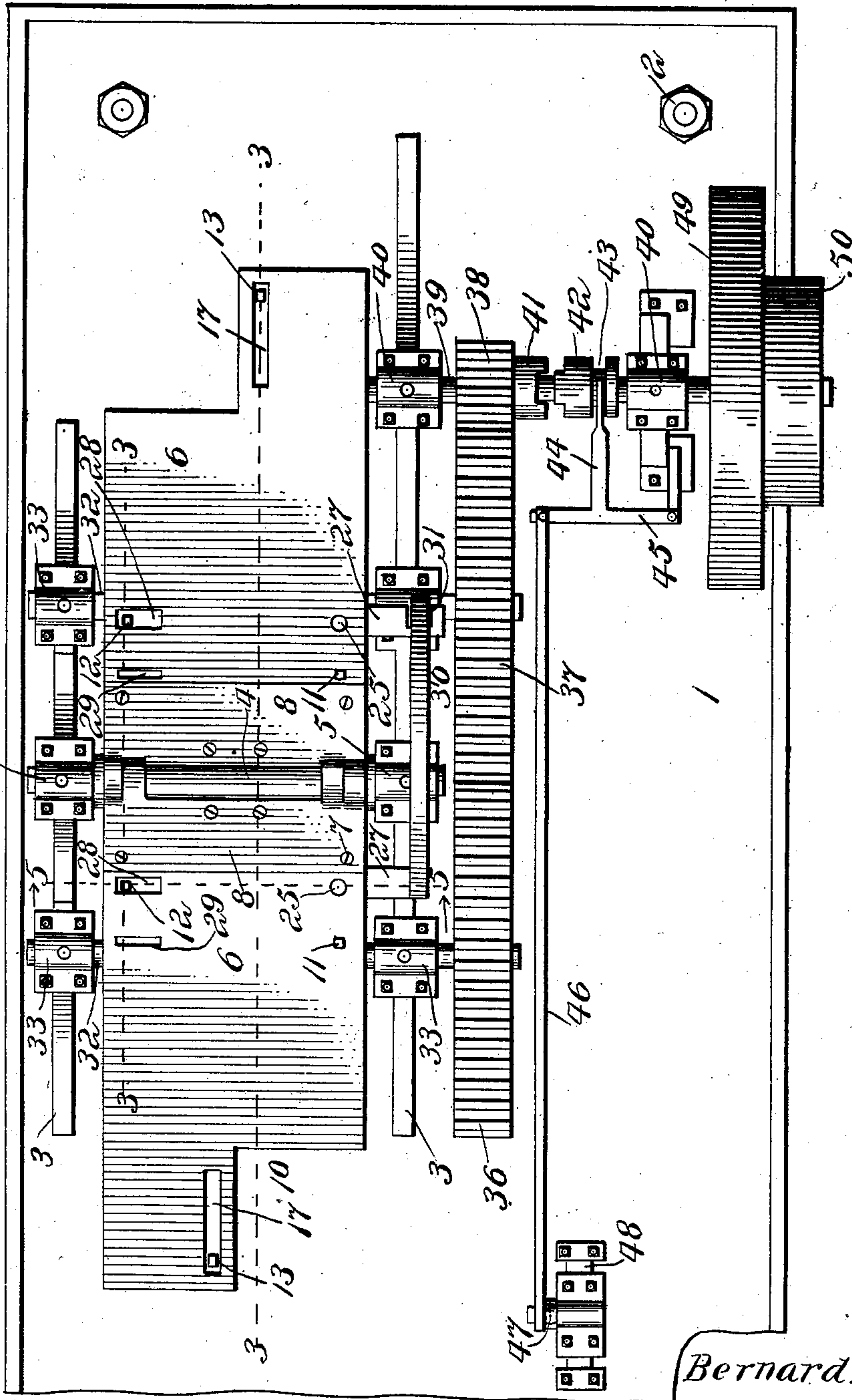
B. H. DOLL.
MACHINE FOR DOUBLING METAL PLATES.

APPLICATION FILED JUNE 16, 1903.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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By

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Attorney

Inventor
Bernard H. Doll

No. 754,433.

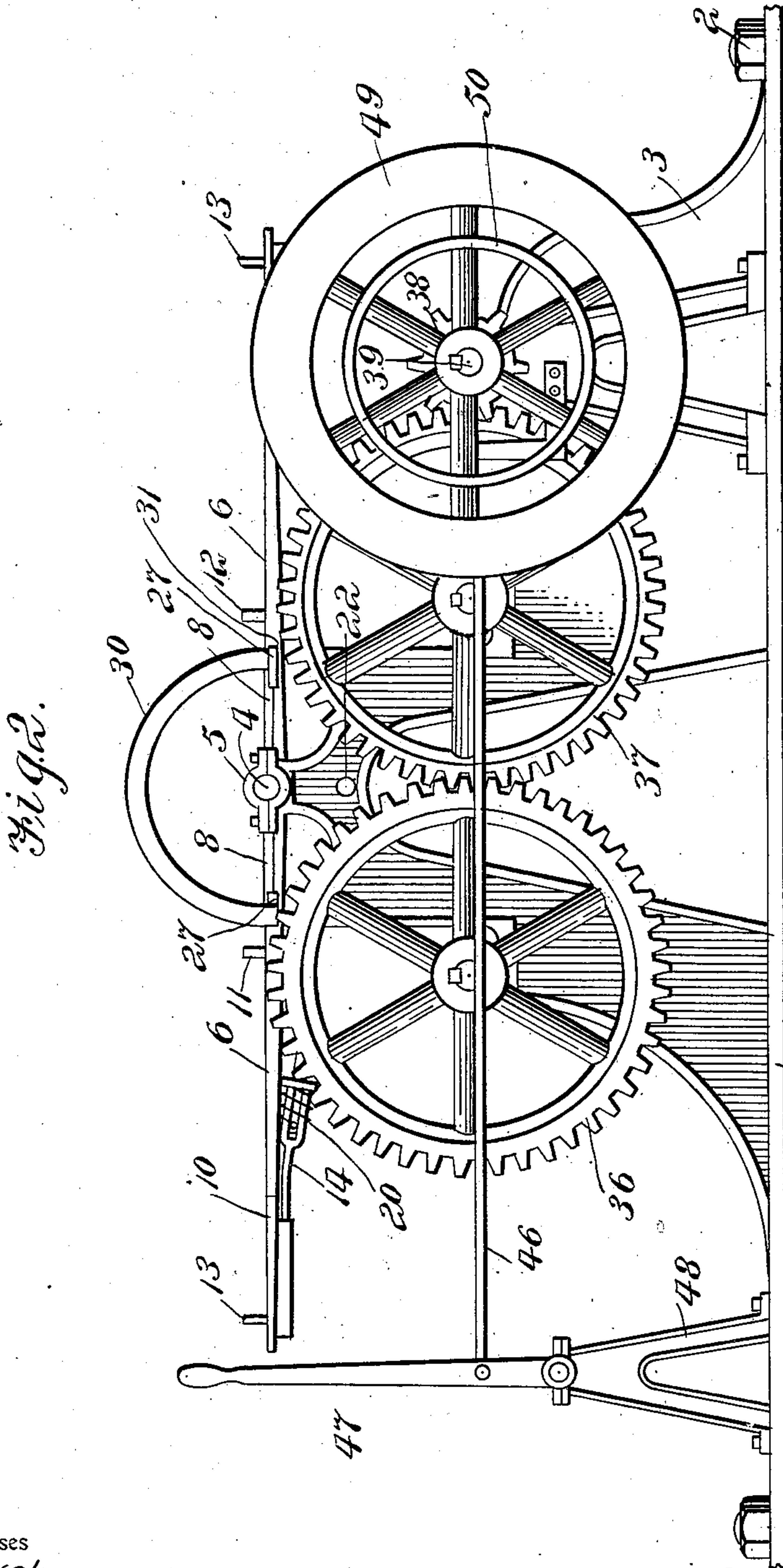
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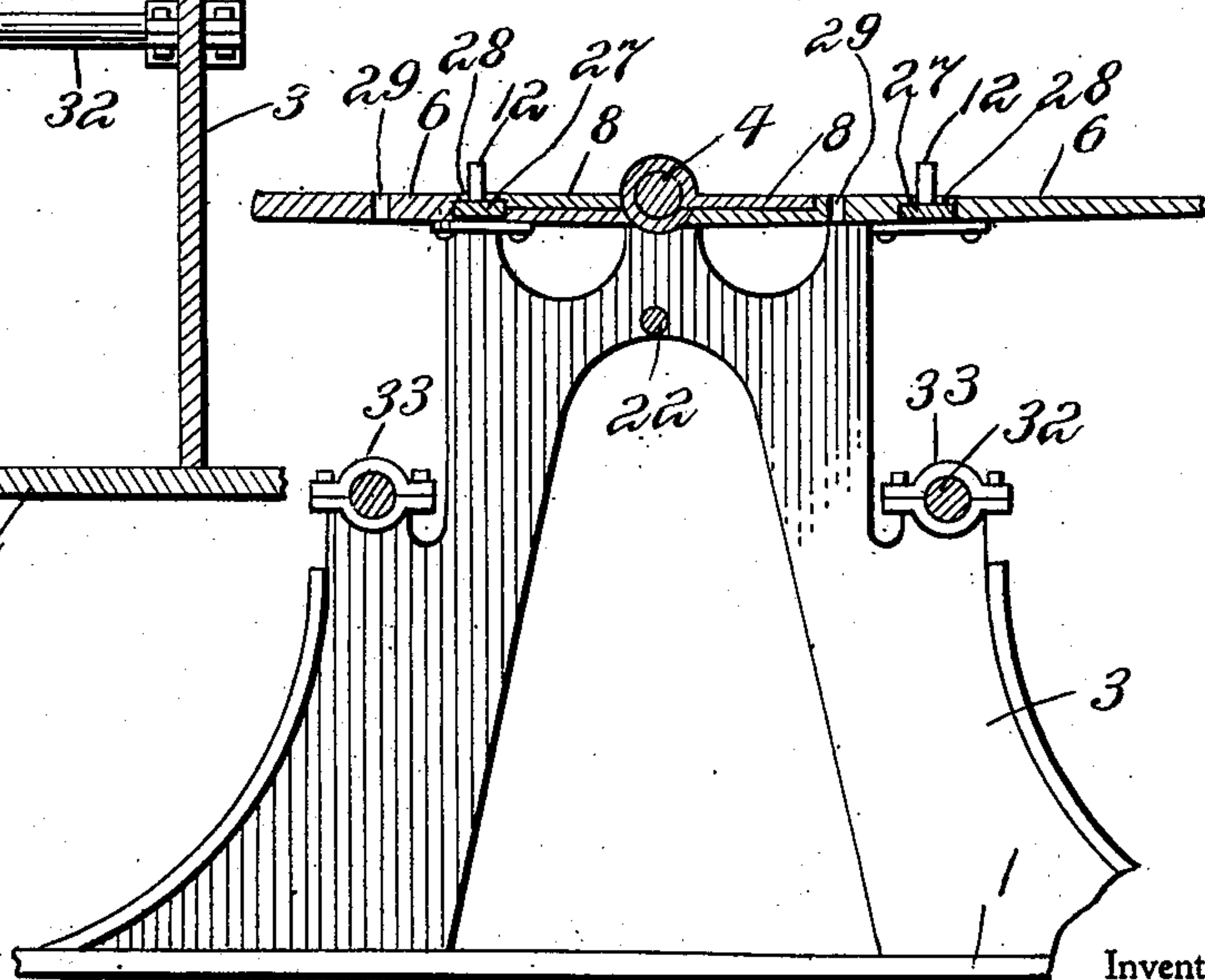
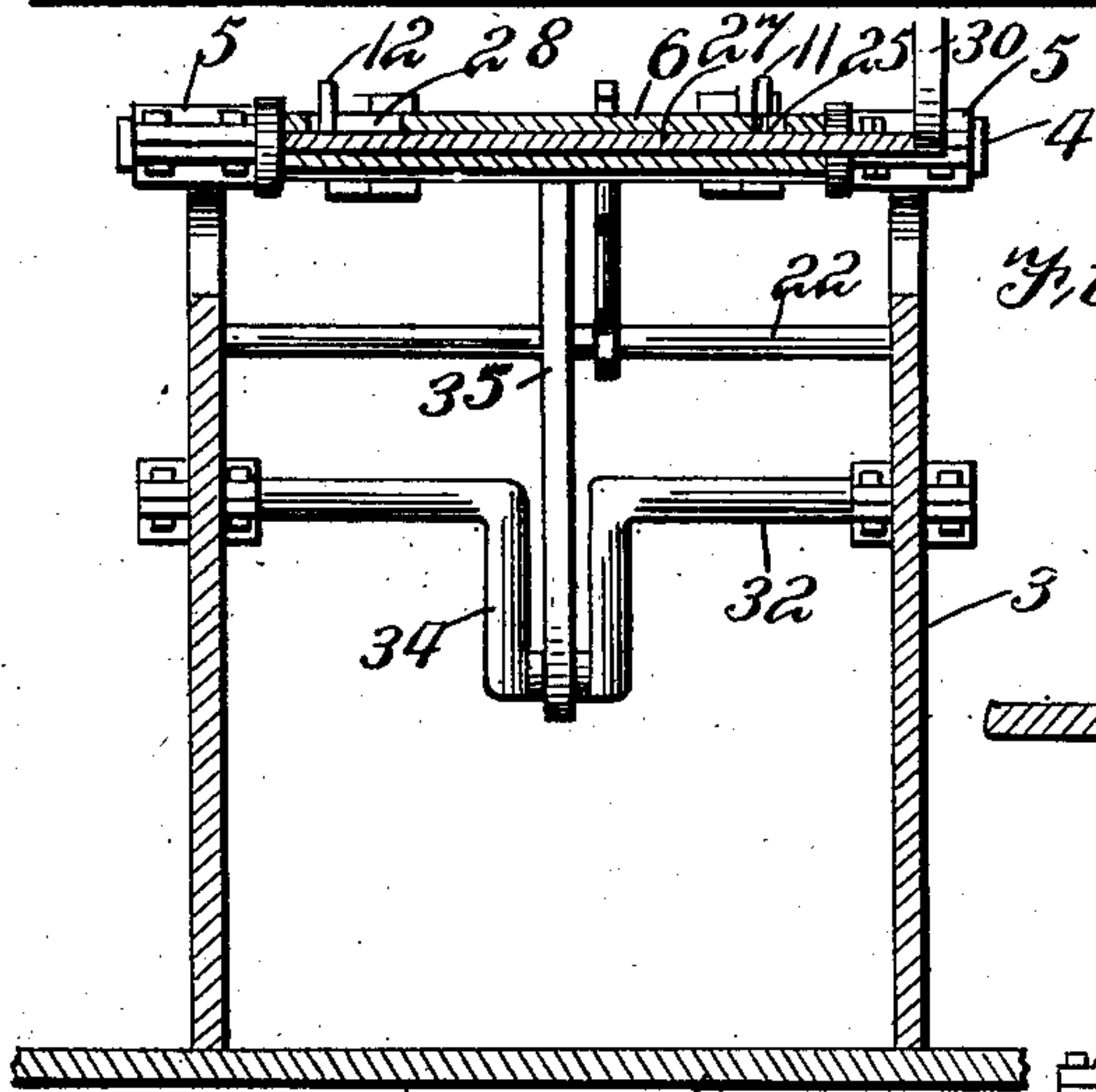
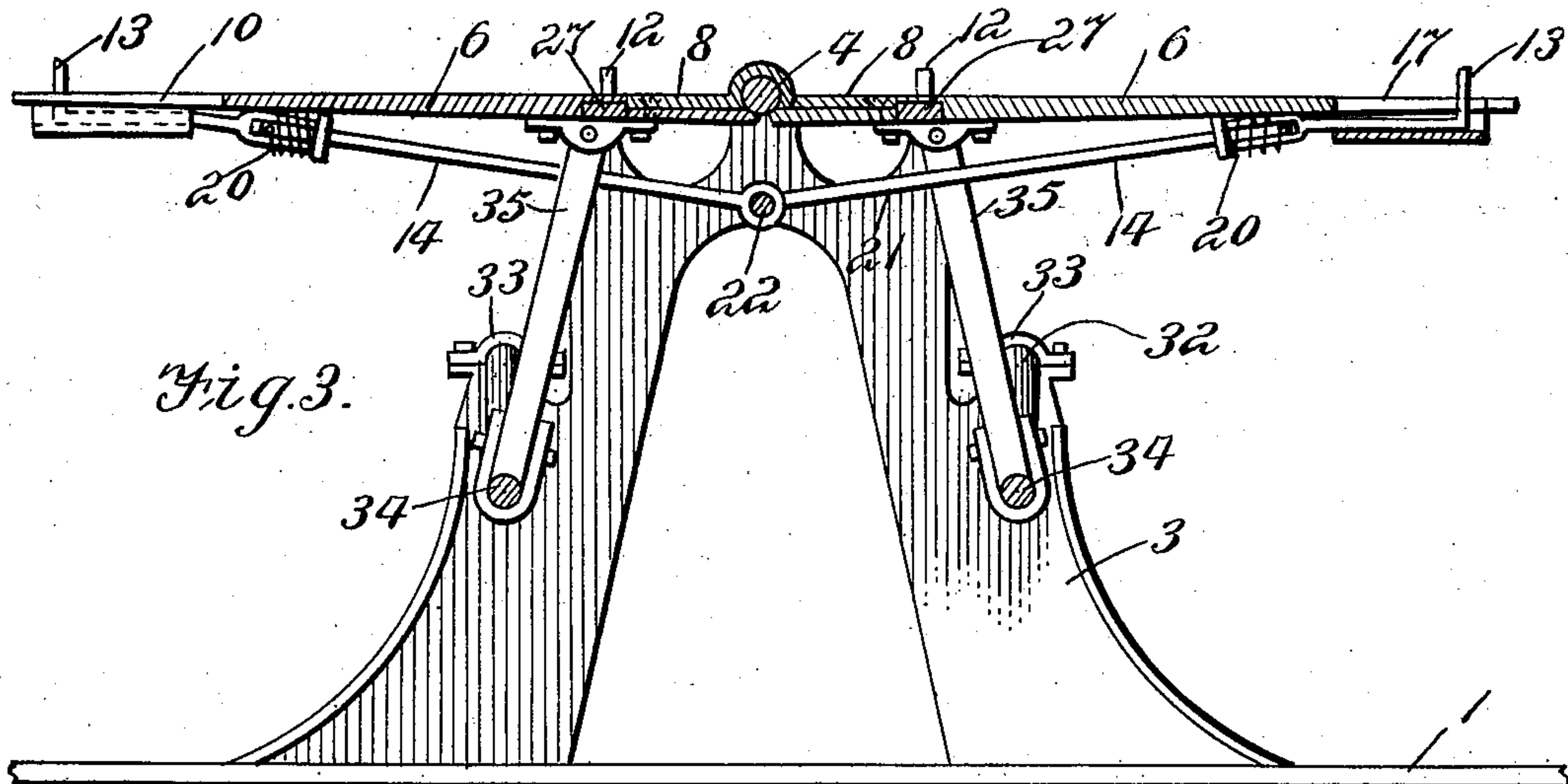
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

BERNARD H. DOLL, OF CUMBERLAND, MARYLAND.

MACHINE FOR DOUBLING METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 754,433, dated March 15, 1904.

Application filed June 16, 1903. Serial No. 161,654. (No model.)

To all whom it may concern:

Be it known that I, BERNARD H. DOLL, a citizen of the United States, residing at Cumberland, in the county of Allegany and State of Maryland, have invented certain new and useful Improvements in Machines for Doubling Metal Plates; and I do 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 machines for folding metal sheets or plates, and more particularly to machines for doubling tin plates.

The object of the invention is to improve and simplify the construction of this class of machines, and thereby render them more durable in use and efficient in operation.

A further object is to provide simple and efficient means for adjusting and holding the plates upon the machine during the bending or folding operation.

With these and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a top plan view of my improved machine, showing the same in position to receive a plate. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal sectional view through the machine, taken on the line 3 3 of Fig. 1. Fig. 4 is a detail sectional view taken on the line 4 4 of Fig. 1. Fig. 5 is a detail sectional view taken on the line 5 5 of Fig. 1.

Referring to the drawings by numerals, 1 denotes a suitable base, preferably of metal and in rectangular form, which is secured to the floor of the rolling-mill by the bolts or other fastening means 2. Upon said base are suitable frames 3, in the upper and central portions of which the bearing-boxes 5 are provided, in which a horizontal shaft 4 is journaled.

To the shaft or rod 4 is suitably hinged the two folding tables or leaves 6, upon which the metal plate or sheet to be doubled is placed. The leaves are hinged to said shaft by securing to the adjacent ends of each by the screws

or bolts 7 one of the hinge members or plates 8, through which the shaft 4 extends. These leaves 6 are preferably rectangular metal plates of a width greater than the broadest piece of work to be bent upon the machine and of a joint length greater than the longest piece. The leaves have a portion of their outer ends cut away, as shown at 10, for a purpose hereinafter described.

As previously stated, the tin or other metallic plates to be doubled are placed upon the leaves 6, which are adapted to be folded together to bend or double the plate or plates between them. In order to hold the plate upon the tables and to keep the same square, I provide suitable side stops 11 and 12 and end adjusters 13.

The end adjusters 13 consist of the sliding rods 14, mounted in guides 15 upon the under side of the leaves. The outer ends of these sliding rods 14 are bent up to project through the slots 17 in the leaves, as at 18, to engage with the ends of the sheet or plate to be doubled. The inner ends of the sliding rods 14 have a spring connection, as shown at 20, with one end of a rod 21, which has its other end pivoted upon a cross-bar 22, connecting the two frames 3. It will be noticed upon reference to Fig. 1 of the drawings that these two end adjusters are not in longitudinal alinement, but are offset so as to register with the spaces 10 formed in the leaves 6 when the latter are brought together. As the leaves fold together the adjusters 18 will slide inwardly to engage the ends of the metal plate and adjust the same longitudinally, so that its center will coincide with the pivotal axis of the doubling leaves. Owing to the construction and the manner of mounting these end adjusters, the metal plate will be held appropriately upon the leaves for doubling, as will be readily understood.

To hold the sides of the metal plate, I provide the fixed stops 11 upon one side and the adjustable clutches or stops 12 upon the other side of the leaves. The stops 11 consist of fixed pins, one of which is placed upon each leaf upon the same side of the machine. These pins or stops are placed adjacent to and at equal distances from the edges of the leaves.

They are so disposed that when the leaves fold together they will register with and project into the holes or apertures 25 in the leaves.

The adjustable stops or clutches 12 are disposed upon the leaves at the opposite side of the machine and consist of stop-pins which are secured to the transversely-sliding bars 27. These bars 27 are mounted to slide in grooves formed in the under side of the leaves and project outwardly upon one side of the machine. The pins extend upwardly from said bars through the transversely-disposed slots 28. The arrangement of the pins or stops 12 is similar to that of the stops 11, and slots 29 are provided in the leaves 6 to receive the stops 12 when the leaves are folded together.

In order to adjust the stops 12 and to cause them to move simultaneously toward and from the stops 11, I provide the arc-shaped rod or plate 30, which is secured to one of said sliding bars 27 and which slides through a slot 31 in the other as the two leaves are folded together. By moving this rod 30 both the sliding rods 27 may be moved, as will be readily understood.

In order to operate the two leaves 6, I provide upon each side and below the shaft 8 a crank-shaft 32, which is journaled in the bearing-boxes 33 upon the frames 3. Each of the cranks 34 of these shafts is connected by a pitman or link 35 to the under side of one of the leaves 6. These links 35 are pivoted to the leaves, so that upon the rotation of the crank-shafts 32 the leaves will be swung together and apart.

Secured upon the end of one of the crank-shafts is a gear 36, which meshes with a similar gear 37, which in turn is in mesh with a pinion 38. This pinion is loosely mounted upon a drive-shaft 39, which is journaled in the bearing-boxes 40. The pinion is formed with a clutch member 41, which is adapted to be engaged by a clutch-head 42, which is mounted to slide longitudinally upon, but keyed to rotate with the shaft 39. This head 42 is formed with the usual annular groove 43, which is engaged by the forked end of the shipper 44. This clutch-shipper 44 is fixed upon a pivoted angle-lever 45, which is connected by the pivoted link or rod 46 to the operating-lever 47. This operating hand-lever 47 is pivoted to a bracket 48, mounted on the base adjacent to one end of the machine. Upon the outer end of the drive-shaft 39 is a fly-wheel 49 and a band wheel or pulley 50.

The operation of the machine is as follows: When the parts of the machine are in the position shown in the drawings, one or more plates or sheets to be bent are placed upon the top of the leaves or tables 6 with one side against the stops 11. The stops 12 are then adjusted by operating the arc-shaped rod 30, so as to engage the opposite side of the plate or plates to square the same. By shifting

the hand-lever 47 to throw the clutch member 42 into engagement with the member 41 the motion of the drive-shaft 39 is imparted to the pinion 38, which will in turn impart motion to the gears 36 and 37 to rotate the crank-shafts 32. As previously stated, these shafts 32 will by means of the links 35 swing the leaves up toward each other to fold or double the plate or plates between them. As the doubling-leaves swing upwardly the rods 14 by reason of the eccentric relation of their pivot 24 to the pivotal axis 4 of the doubling-leaves cause the adjusters 13 to move inwardly toward each other into engagement with the ends of the plate and to adjust the plate so that its longitudinal center coincides with the pivot 4 of the doubling-leaves, the springs 20, which are included in the connections between the adjusters 13 and the rods 14, preventing the adjusters from exerting such stress upon the plate as to cause the latter to buckle. The continued movement of the crank-shafts will again open the leaves to permit the doubled plates to be removed.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a machine for doubling plates, the combination with folding-leaves, of sliding automatically-operated end clutches for engaging the ends of the plates, and adjustable sliding side clutches for engaging the sides of the plates, substantially as described.

2. In a machine for doubling plates, the combination of angularly-movable doubling-leaves, adjusters movable longitudinally with respect thereto, and connections effective by the angular movement of the doubling plates to operate said adjusters, said connections including yieldable elements and springs to keep the adjusters in engagement with the work, substantially as described.

3. In a machine for doubling plates, the combination of a suitable frame, folding-leaves pivotally mounted thereon, fixed side stops upon one side of said leaves, sliding bars mounted in said leaves and carrying stops, means for simultaneously operating said sliding bars to adjust their stops toward and from said fixed stops, substantially as described.

4. In a machine for doubling plates, the combination of a suitable frame, folding-leaves pivotally mounted thereon, fixed side stops upon one side of said leaves, sliding bars mounted in said leaves and carrying stops projecting

through slots in said leaves, and an arc-shaped rod carried by one of said bars and having a sliding connection with the other, substantially as described.

5 5. In a machine for doubling plates, the combination of angularly-movable doubling-leaves, adjusters movable longitudinally with respect thereto, and connections effective by the angular movement of the doubling plates
10 to operate said adjusters, said connections including slidably-related elements and springs to keep the adjusters in engagement with the work, substantially as described.

15 6. In a machine for doubling plates, the combination with angularly-movable doubling-leaves, of adjusters slidably related thereto, and pivoted rods connecting said adjusters to a fixed point, the pivot of said rods being ec-

centric with reference to the pivotal axis of the doubling-leaves, substantially as described. 20

7. In a machine for doubling plates, the combination of angularly-movable doubling-leaves, adjusters slidably related thereto, means to operate said adjusters automatically, shafts having cranks, pitmen connecting the
25 said cranks to the doubling-leaves to angularly operate the latter, and gears connecting said crank-shafts together for simultaneous reverse revolution, substantially as described.

In testimony whereof I have hereunto set my
30 hand in presence of two subscribing witnesses.

BERNARD H. DOLL

Witnesses:

W. M. DAVIS,
C. E. METZ.