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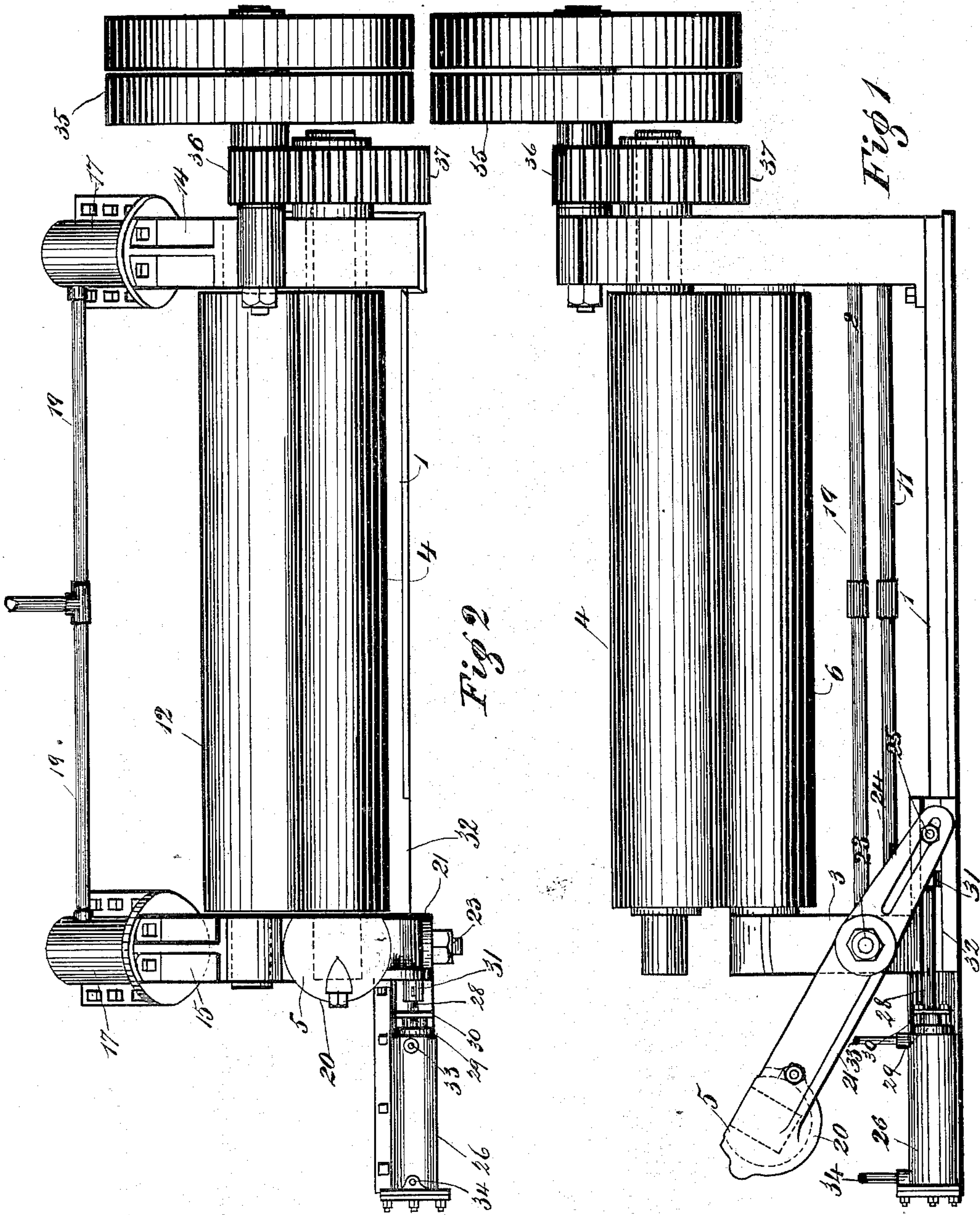
Patented Nov. 6, 1900.

G. W. STIFEL & W. C. PRITCHARD.
ROLLER BENDING MACHINE.

(Application filed Dec. 23, 1899.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES:

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William C. Pritchard

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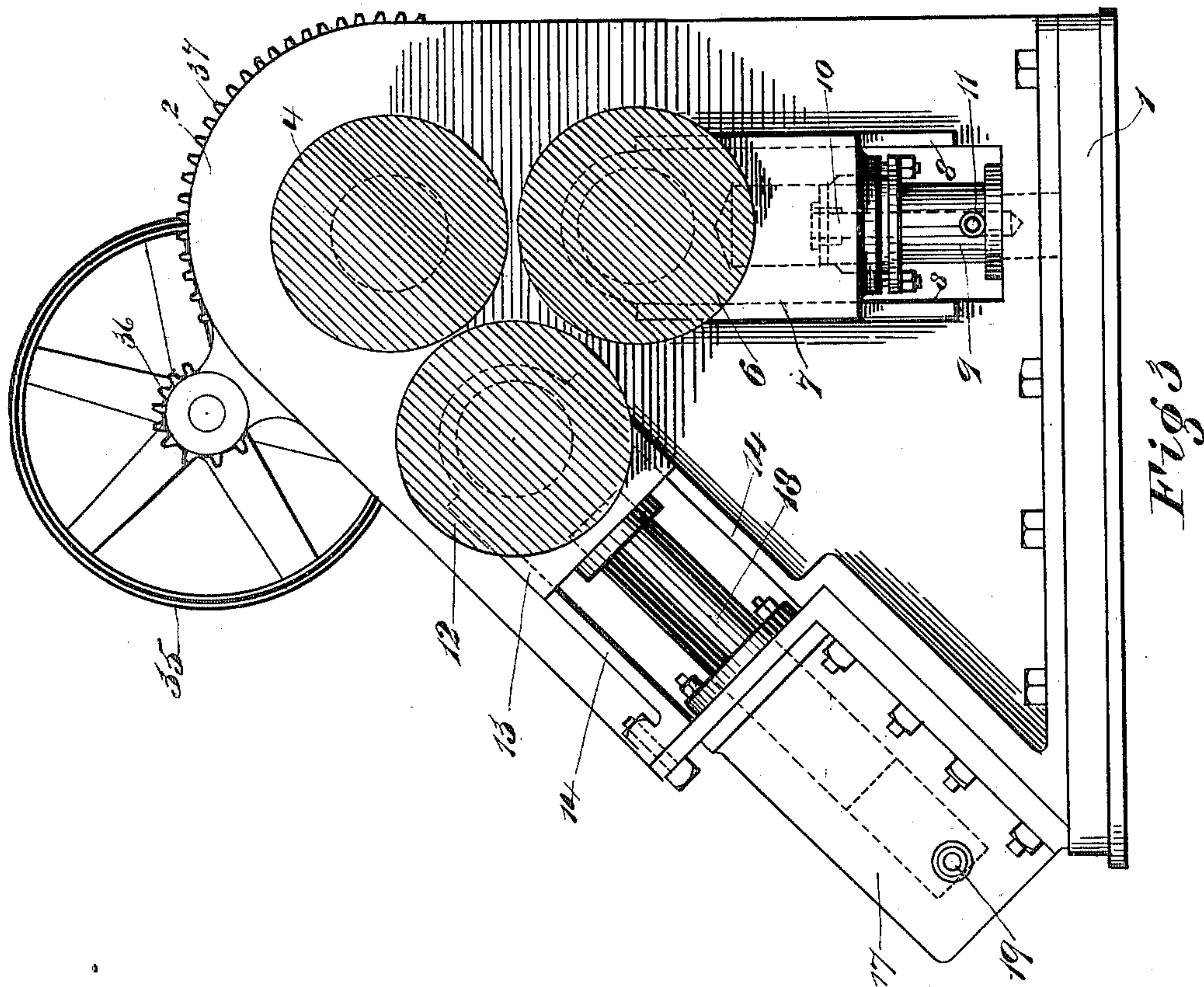
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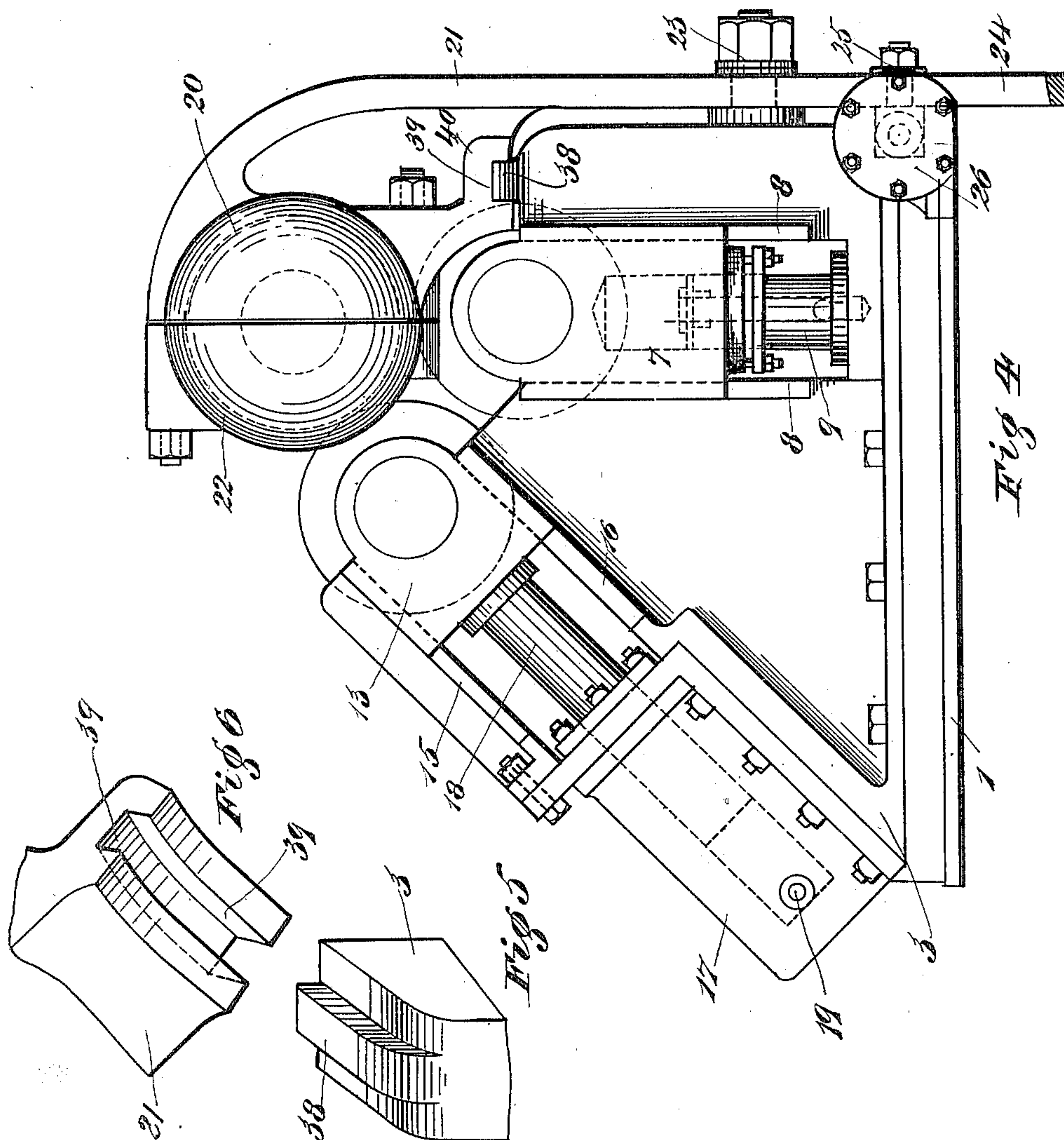
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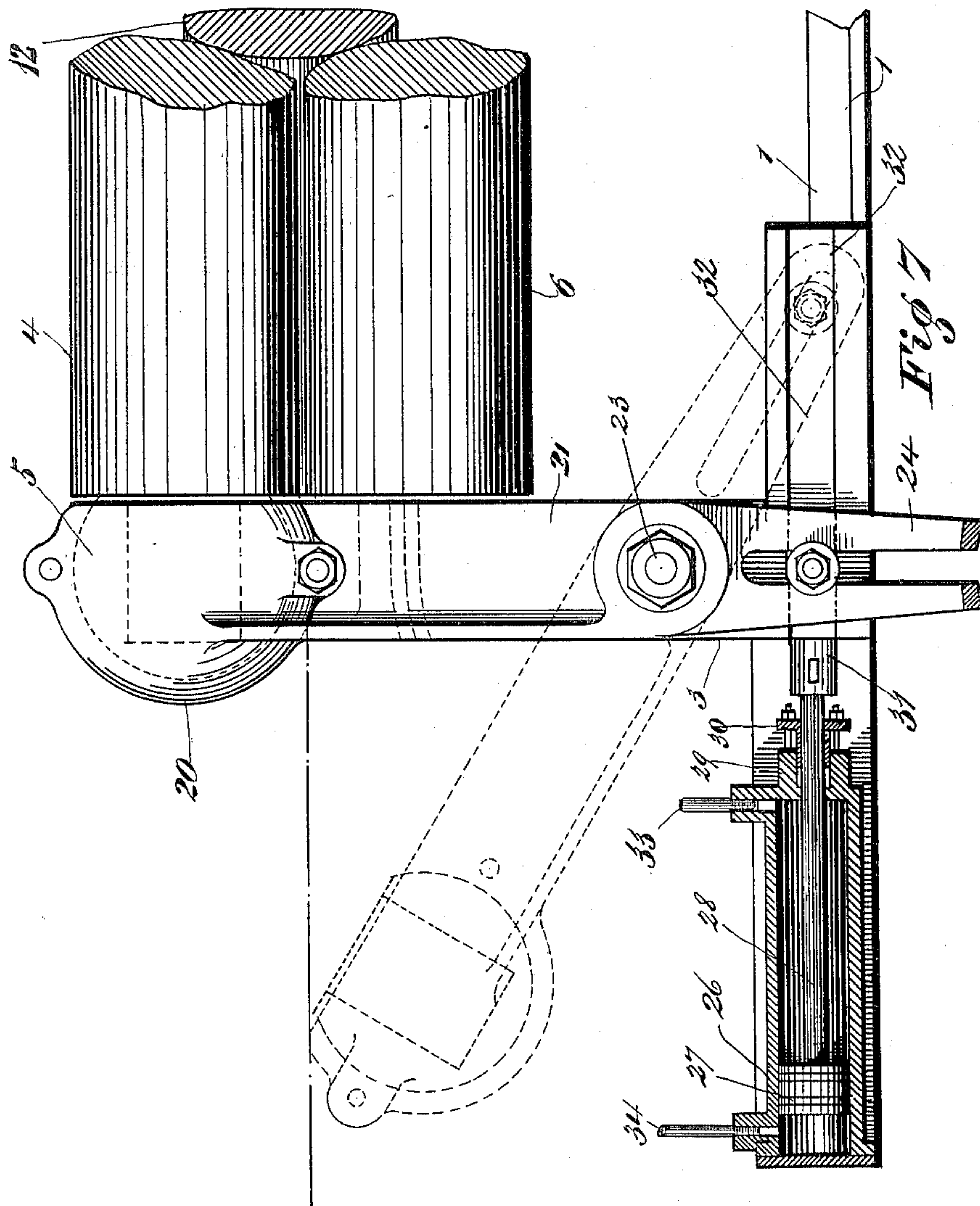
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UNITED STATES PATENT OFFICE.

GEORGE W. STIFEL AND WILLIAM C. PRITCHARD, OF CAMBRIDGE CITY,
INDIANA.

ROLLER BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 661,459, dated November 6, 1900.

Application filed December 23, 1899. Serial No. 741,451. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. STIFEL and WILLIAM C. PRITCHARD, citizens of the United States, residing at Cambridge City, in the county of Wayne and State of Indiana, have invented new and useful Improvements in Roller Bending-Machines, of which the following is a specification.

Our invention relates to certain new and useful improvements in roller bending-machines for rolling and bending or warping metal plates or sheets into cylindrical form; and it consists of a fixed or master roll and two inferior or subordinate rolls, which latter are operated by hydraulic mechanism which may be regulated at will to be either positive or yielding in their action and will be hereinafter more fully set forth.

The object of this our invention is to provide a means for manipulating the rolls to work the material into form with despatch and less labor than heretofore and to facilitate the removal of the material from between the rolls when formed into the required form. We obtain this object by means of the mechanism illustrated in the accompanying drawings, in which similar numerals of reference designate like parts throughout the several views.

Figure 1 is an elevational front view of the machine, showing the supporting-lever of the removable or slip bearing of the master-roll swung outwardly to release the end or neck journal of said roller to permit the removal of the metal plate or sheet when bent into the desired form to be removed from between the rolls. Fig. 2 is a plan view of the same. Fig. 3 is an enlarged transverse sectional elevational view of the machine, showing the arrangement of the hydraulic cylinders for controlling the inferior rolls and looking toward the drive end of the machine. Fig. 4 is an enlarged end elevational view of the machine, showing the slip or removable neck-bearing of the master-roller. Fig. 5 is a broken-off perspective view of the forward top portion of the end housing and showing the locking-tongue of the bearing-lever. Fig. 6 is a view of a broken-off portion of the slip bearing or supporting lever and showing the engaging lip and the tongue-receiving groove thereof;

and Fig. 7 is a broken-off partly-sectional view of the machine, showing the removable bearing end of the master-roll and the means for removing or releasing the said roller of such bearing.

The bed 1 is provided with the end housings 2 and 3, which are securely bolted to the ends thereof. The master-roll 4 is journaled at its drive end in a fixed journal-bearing, formed in the housing 2 and at its opposite end in the slip or removable journal-bearing 5, hereinafter more particularly referred to. The inferior roller 6 is journaled at its reduced or neck journal ends in the sliding journal-boxes 7, both of which are alike and are arranged to slide in suitable guideways 8, formed in the housings 2 and 3. The journal-boxes 7 are each provided with cylindrical chambers, which are adapted to receive the plungers 9, both of which plungers are alike and mounted at their bottom ends in the housings 2 and 3 between the guides of the ways 8, and said plungers are each provided with central core openings or bores, which connect with the cylinder-chambers of the guide-blocks or journal-boxes 7. Side ports 11, connecting with the central or core bores of the plungers, are also provided and to which are connected suitable feed and exhaust pipes.

The rear or trailing inferior roller 12 is journaled at its ends in the boxes 13, which latter are adapted to slide in the guideways 14, formed in the housing 2, and the way formed by the removable guide 15 and the fixed guide 16, formed on the housing 3, and both said guideways are inclined at an angle of forty-five degrees with the horizontal and so situated that the plane of the travel of the said rear inferior roller will fall to the rear of the axis of the master-roll 4, which relative position of the rollers is provided for the purpose of facilitating the bending of the metal plate while being passed through the bite of the rolls.

Hydraulic cylinders 17 are bolted to each of the housings 2 and 3 and are adapted to receive the plungers 18, which latter have their opposite projecting ends connected to the sliding boxes 13. Both the hydraulic cylinders are provided with the connecting-pipes 19, by which the fluid under pressure is conducted

to and admitted into and exhausted from them to simultaneously operate the said plungers 18 to cause the inferior trailing roller 12 to either advance toward or recede from the master-roll or to be maintained at a fixed position relatively thereto similar to that of the inferior rolls 6.

The slip or removable journal-bearing 5 is spherical in form and is supported in a socket-bearing 20, formed integral on the top end of the lever 21, and is provided with the removable cap 22. The lever 21 is pivotally mounted on the fulcrum-journal 23, secured to the front of the housing 3, and said lever has its lower prolonged end 24 slotted to receive the cross-head pin 25.

The double-acting cylinder 26 is firmly bolted to the bed 1 and is provided with the piston 27 and the piston-rod 28, which latter passes through a suitable packing-box 29 and glands 30 and has its outer projecting end connected to the sliding cross-head 31. The cross-head 31 is adapted to slide in the guideways 32, formed in the housing 3 and the bed 1, and said cross-head carries the cross-head pin 25, which latter works in the slotted portion 24 of the lever 21.

The cylinder 26 is provided with the connecting-pipes 33 and 34, which are provided with suitable triple inlet and outlet valves so arranged that when one of the valves is full open to exhaust the opposite valve, or the valve connected to the opposite end of the cylinder, is full open to admit the fluid under pressure into the cylinder, and vice versa. When both the said valves are closed, said piston 27 will be held at rest to retain said lever at rest at any required portion of its swing. Similar triple or three-way valves are connected to the pipes 19 and 11, (not shown,) which connect the cylinders 17 and the pistons 9, whereby the fluid under pressure may be regulated to be admitted and exhausted to manipulate the inferior rolls 6 and 12 to cause them to simultaneously approach toward or recede from the master-roll 4, or when said valves are closed to either admission or exhaust the said rolls may be held in any desired position relatively to and independently of each other and to the master-roll.

The master-roll is driven by any suitable drive-gearing—as, for illustration, the belt-pulley 35, on the hub of which is keyed or otherwise secured the pinion 36, which latter meshes with the spur-gear 37, securely keyed on the prolonged end of the neck-journal of the master-roll 4.

In order that the master-roll be held securely and free from vibration while the machine is in operation, and particularly when heavy plate metal is being manipulated by the rolls, a locking-tongue 38, formed integral on the top forward end of the housing 3, is

provided to engage and lock in the groove 39, formed in the lip 40 of the swinging lever 21. It will be observed that the tongue 38 extends longitudinally with the swing of the lever 21, thereby offering an extended bearing for the groove 39, and consequently for the unsupported end of the lever when the latter is swung into working position.

Having thus fully described this our invention, what we claim as new and useful, and desire to cover by Letters Patent of the United States therefor, is—

1. In a roller bending-machine, the combination with a master-roll having its drive end in a fixed journal-bearing and its opposite end in a slip or removable journal-bearing, of forward and rearward inferior rolls, journal-boxes wherein said inferior rolls are supported at their ends, suitable slides wherein said journal-boxes traverse, and suitable hydraulically-operated mechanism for traversing said journal-boxes whereby the inferior rollers are caused to independently or jointly approach toward or recede from said master-roll.

2. In a roller bending-machine, the combination with a master-roll, of a pivotal lever having a top socket end and a lower slotted end, a slip journal-bearing having a spherical exterior surface and supported by said socket, a cross-head and a cross-head pin adapted to slide in the slot of said pivotal lever, and suitable hydraulically-operated mechanism for traversing said cross-head.

3. In a roller bending-machine, the combination with a master-roll, a pivotally-supported lever having a top socket end, of a slip-journal having a spherical exterior surface adapted to fit in and turn in said socket and suitable hydraulically-operated mechanism for manipulating said pivotal lever.

4. In a roller bending-machine, the combination with a master-roll, of a pivotal lever and a slip journal-bearing pivotally connected to the end of said lever, and means for manipulating said lever to either engage or disengage said slip-bearing.

5. In a roller bending-machine, the combination with a master-roll, of a pivotal lever, a slip journal-bearing pivoted on the top end of said lever, of a locking-tongue, as described, and a lip on said pivotal lever having a groove adapted to receive said locking-tongue, substantially as and for the purpose set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE W. STIFEL.

WILLIAM C. PRITCHARD.

Witnesses:

LEWIS E. HAHN,

MIKE R. KRAHL.