

No. 779,566.

PATENTED JAN. 10, 1905.

T. L. & T. J. STURTEVANT.
ROLL CRUSHING MILL.

APPLICATION FILED NOV. 7, 1903. RENEWED NOV. 4, 1904.

3 SHEETS—SHEET 1.

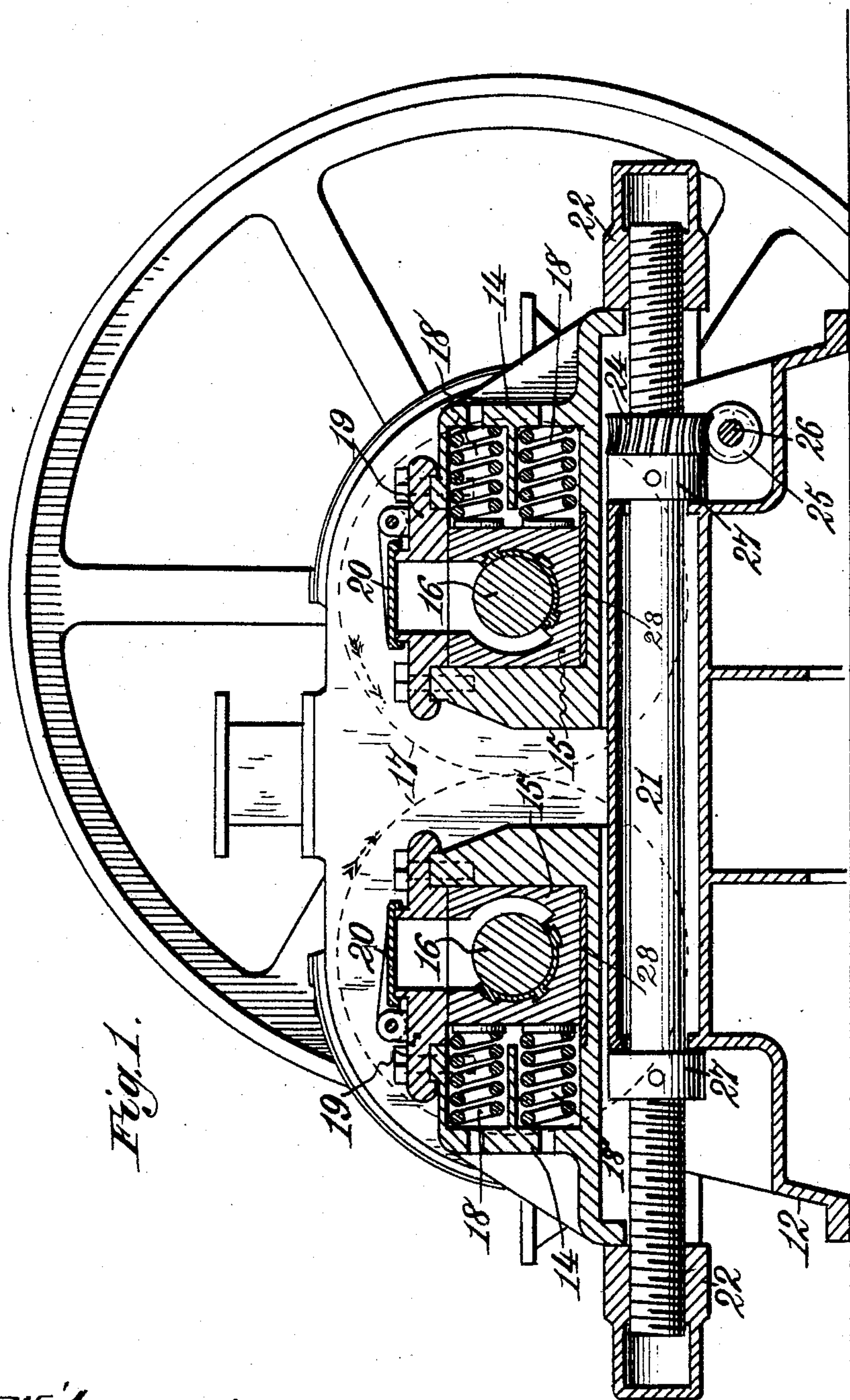


Fig. 1.

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by *Sturtevant & Co.* Attys.

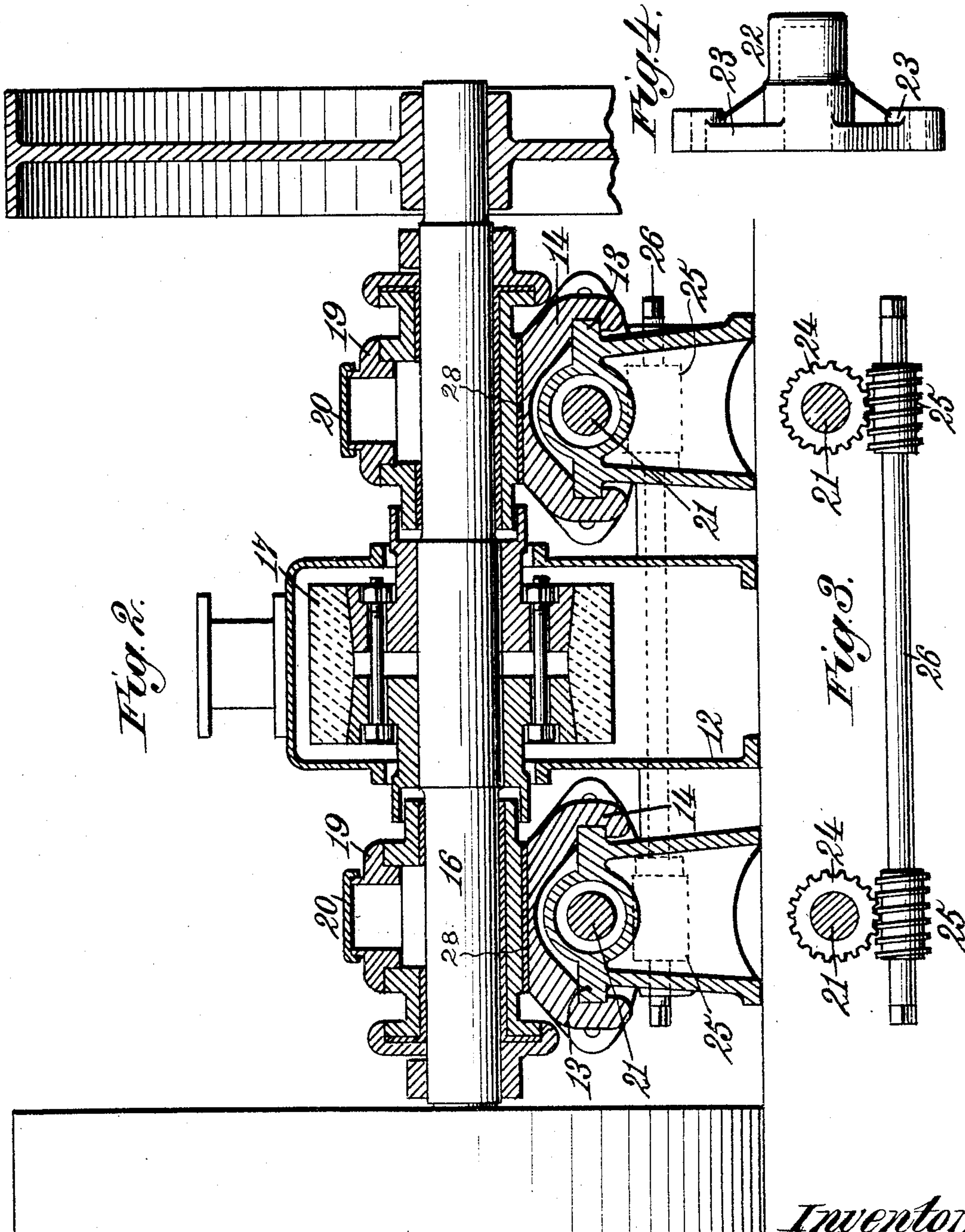
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3 SHEETS—SHEET 2.



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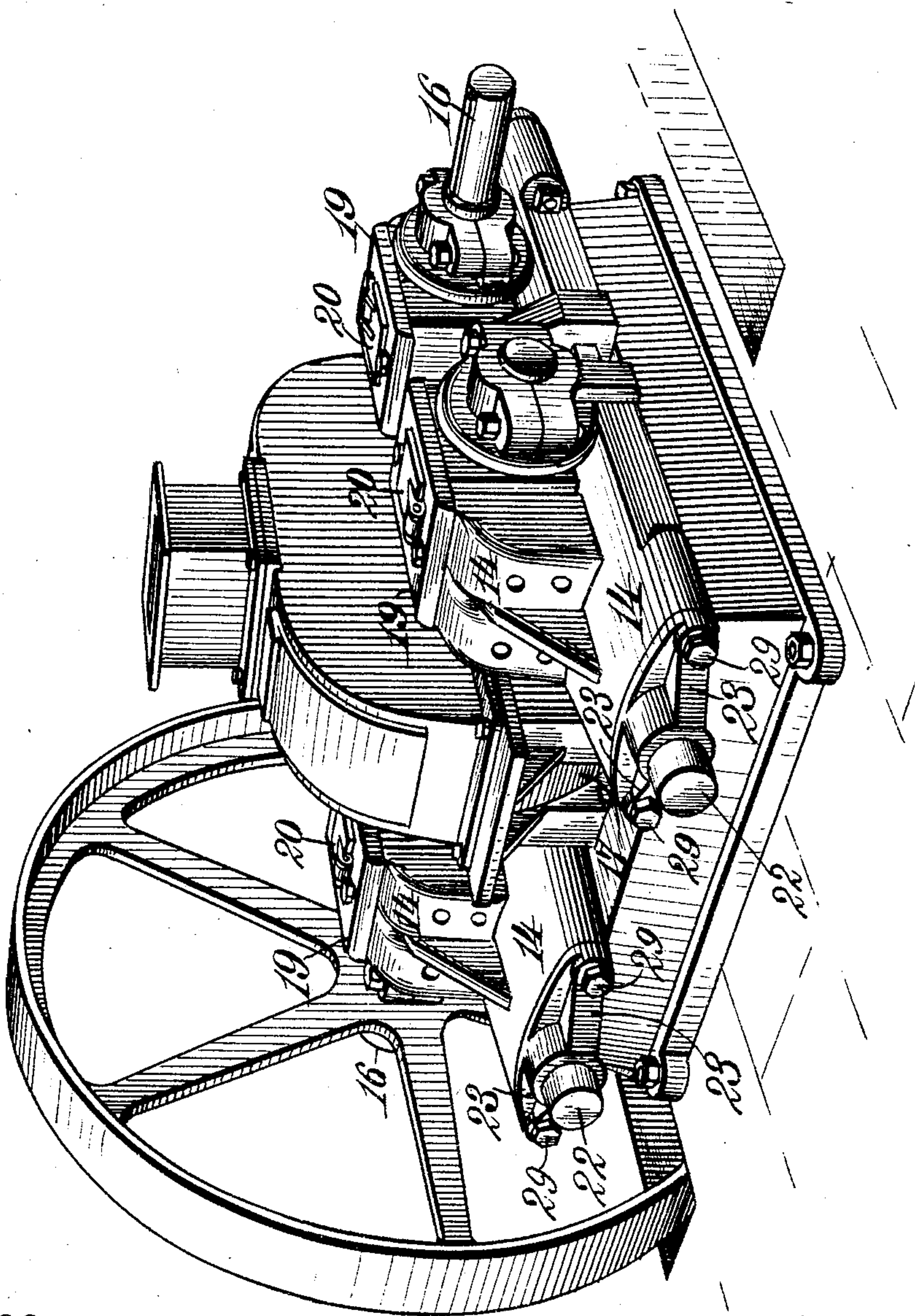
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3 SHEETS—SHEET 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS L. STURTEVANT, OF QUINCY, AND THOMAS J. STURTEVANT, OF WELLESLEY, MASSACHUSETTS, ASSIGNORS TO THE STURTEVANT MILL COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE.

ROLL CRUSHING-MILL.

SPECIFICATION forming part of Letters Patent No. 779,566, dated January 10, 1905.

Application filed November 7, 1903. Renewed November 4, 1904. Serial No. 231,450.

To all whom it may concern:

Be it known that we, THOMAS L. STURTEVANT, residing at Quincy, and THOMAS J. STURTEVANT, residing at Wellesley, in the county of Norfolk and State of Massachusetts, citizens of the United States, have invented certain new and useful Improvements in Roll Crushing-Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of crushing-machines comprising crushing-rolls between which the material is reduced; and the invention has for its object to provide suitable bearings in which the roll-shafts are so mounted as to be capable of yielding somewhat, so as to reduce the shock and strain of extraordinary resistance in the crushing operations, and adapted to be simultaneously and equally adjusted toward and from each other for the purpose of regulating the output of the crushing-machines and in such a manner as always to keep the crushing-rolls in proper parallel alinement. To this end the crushing-machine is provided with suitable box-bearings, which are movably mounted in bearing supports or carriers and which are held in working positions by nests of powerful coil-springs placed behind them in their supports or carriers and which yieldingly hold the bearing-boxes in working positions. The bearing supports or carriers are adjustably mounted on the frame of the machine and are connected together by screw tie-rods, the opposite ends of which are oppositely threaded to engage suitable nuts connected with or abutting against the bearing supports or carriers in such a manner that said supports or carriers will be moved toward and from each other equally and simultaneously by turning the said screw tie-rods, which latter are geared to a transverse shaft, which when turned will turn both of said rods to simultaneously adjust the bearing supports or carriers.

In the accompanying drawings, Figure 1 is a longitudinal section of the improved crushing-machine through the bearing-boxes and their supports at one side of the machine.

Fig. 2 is a transverse section taken on the line of one of the crushing-roll shafts. Fig. 3 is a detail view to show the gear connection between the two screw tie-rods of the machine. Fig. 4 is a detail plan view of one of the nuts of the tie-rods. Fig. 5 is a perspective view of the improved crushing-machine with one of the fly-wheels omitted.

Referring to the drawings, 12 denotes the base or frame of the machine, comprising portions which are provided with flanges 13, engaging the sliding or adjustable bearing supports or carriers 14, grooved for the reception of the said flanges and in which bearing supports or carriers are mounted the box-bearings or bearing-boxes 15, in which are journaled the shafts 16, carrying the crushing-rolls 17. The rear portions of the bearing supports or carriers 14 are recessed for the reception of nests of powerful coil-springs 18, which force the bearing-boxes toward the front portions of their supports or carriers, but which will yield under great force or pressure to properly cushion the action of the crushing-rolls.

The bearing supports or carriers are provided with tie-caps 19, provided with grooves on their lower faces to embrace ribs on the upper sides of the said bearing supports or carriers, so as to hook over and properly brace the side portions of the said supports or carriers, to thereby strengthen the same, and the said tie-caps and the bearing-boxes are suitably recessed for the reception of packing to retain the lubricating-oil, as is common with bearing-boxes for car-wheels. The tie-caps are properly bolted to the bearing-boxes and are provided with covers 20, by which the openings therein may be closed to exclude dirt and grit.

Extending lengthwise of the machine are screw tie-rods 21, the opposite ends of which are oppositely threaded for engagement with threaded nuts 22, with which the bearing supports or carriers are connected, so that by turning the said screw tie-rods the bearing supports or carriers will be equally and simultaneously adjusted toward and from each other. The nuts 22 are provided with arms

23, having holes for the reception of suitable rods or bolts 29, by which said nuts are secured to the supports or carriers 14. The said rods or bolts thus prevent the said nuts from turning with the screw tie-rods 21 and will cause the said supports or carriers to move simultaneously toward or from each other with said nuts when said screw tie-rods are turned for effecting adjustments of the crushing-rolls. To provide for the simultaneous turning of the screw tie-rods, the latter are provided with worm-wheels 24, engaged by worms 25 on a transverse shaft 26, having squared ends adapted to receive a wrench, by which the said shaft may be turned.

Beneath the movable bearing-boxes 15 in the bearing supports or carriers 14 are placed steel wear-plates 28, on which the said bearing-boxes 15 may move back and forth as the said boxes yield against the pressure of the springs 18 to permit the crushing-rolls to adapt themselves to material passing between them. These plates 28 receive the wear incidental to the movements of the bearing-boxes 15 and may be removed when necessary to be replaced by new wear-plates, thereby protecting the more expensive bearing supports or carriers from wear and injury which would otherwise result.

The tie-rods 21 are provided with rigidly-attached collars 27, which abut against the machine-frame and hold the said tie-rods from longitudinal movements.

From the foregoing it will be apparent that the construction described provides suitable yielding bearing-boxes in which the shafts of the crushing-rolls are journaled and which boxes are mounted in supports or carriers adapted for equal and simultaneous adjustment toward and from each other to vary the output, while at all times retaining the faces of the crushing-rolls in parallel alinement regardless of their positions of adjustment, and thus avoiding an objection in some existing crushing-machines in which the bearings for the roll-shafts are adjustable independently of each other, so that great care must be exercised in making the adjustments in order to keep the faces of the crushing-rolls in parallel alinement.

While we have shown the screw tie-rods as being oppositely threaded at their opposite ends for the purpose of simultaneously adjusting the bearings of both shafts from or toward each other, it will be understood that the bearings of one of the shafts might be fixed and the two bearings of the other shaft might be simultaneously and equally adjusted by the worm-gearing herein shown and described by simply threading one end only of each of the tie-rods, so as to adjust one roll from or toward the other roll in such a manner and by a simultaneous movement of both bearings of the adjustable shaft as to keep its

crushing-face in parallel alinement with the crushing-face of the non-adjustable roll.

Having thus described our invention, we claim and desire to secure by Letters Patent—

1. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing supports or carriers the rear portions of which are suitably recessed, bearing-boxes movably mounted in said supports or carriers, and nests of coil-springs housed in the rear recessed portions of said supports or carriers and yieldingly holding the said boxes in working positions, said bearing supports or carriers being provided with tie-caps hooked over ribbed portions thereof.

2. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing supports or carriers the rear portions of which are suitably recessed, bearing-boxes movably mounted in said supports or carriers, nests of coil-springs housed in the rear recessed portions of said supports or carriers and yieldingly holding the said boxes in working positions, and means for equally and simultaneously adjusting the bearing supports or carriers for each of said shafts toward and from each other.

3. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing supports or carriers the rear portions of which are suitably recessed, bearing-boxes movably mounted in said supports or carriers, nests of coil-springs housed in the rear recessed portions of said supports or carriers and yieldingly holding the said boxes in working positions, and means for equally and simultaneously adjusting the bearing supports or carriers for each of said shafts toward and from each other, said means comprising screw tie-rods oppositely threaded at or near their opposite ends and provided with nuts engaging said bearing supports or carriers, and a transverse shaft geared to both of the said screw tie-rods.

4. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of a pair of bearings, for each of said shafts, movably mounted on the frame of the machine, and means for equally and simultaneously adjusting each pair of bearings toward and from the other pair, said means comprising screw tie-rods oppositely threaded at or near their opposite ends and provided with nuts engaging said bearings, and a transverse shaft geared to both of said screw tie-rods.

5. In a roll crushing-machine, the combination with a pair of crushing-rolls and the shafts by which said rolls are carried, of a pair of bearing-boxes, 15, for said shafts, supports or carriers 14 in which the said bearing-boxes

are movably mounted and which supports or carriers are adjustably mounted on the frame of the machine, nests of coil-springs 18 housed in said supports or carriers behind said bearing-boxes, screw tie-rods 21 provided with nuts 22 engaging said supports or carriers, worm-wheels on said tie-rods, and a transverse shaft having worms engaging the said worm-wheels.

6. In a roll crushing-machine, the combination with a pair of crushing-rolls and the shafts by which said rolls are carried, of a pair of bearing-boxes, 15, for said shafts, supports or carriers 14 in which the said bearing-boxes are movably mounted and which supports or carriers are adjustably mounted on the frame of the machine, nests of coil-springs 18 housed in said supports or carriers behind said bearing-boxes, screw tie-rods 21 provided with nuts 22 engaging said supports or carriers, worm-wheels on said tie-rods and a transverse shaft having worms engaging the said worm-wheels, said supports or carriers being provided with grooves and the said machine-frame having flanges fitting said grooves and forming ways on which said supports or carriers have sliding adjustments.

7. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing sup-

ports or carriers the rear portions of which are suitably recessed, bearing-boxes movably mounted in said supports or carriers, nests of coil-springs housed in the rear recessed portions of said supports or carriers and yieldingly holding the said boxes in working positions, and wear-plates in said supports or carriers beneath the said boxes.

8. In a roll crushing-machine, the combination with a pair of crushing-rolls and shafts by which said rolls are carried, of bearing supports or carriers the rear portions of which are suitably recessed, bearing-boxes movably mounted in said supports or carriers, nests of coil-springs housed in the rear recessed portions of said supports or carriers and yieldingly holding the said boxes in working positions, wear-plates in said supports or carriers beneath the said boxes, and means for equally and simultaneously adjusting the bearing supports or carriers for each of said shafts toward and from each other.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS L. STURTEVANT.
THOMAS J. STURTEVANT.

Witnesses:

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W. H. ELLIS.