May 12, 1925. 1,537,240

H. A. LEWIS

MILL SCREW-DOWN

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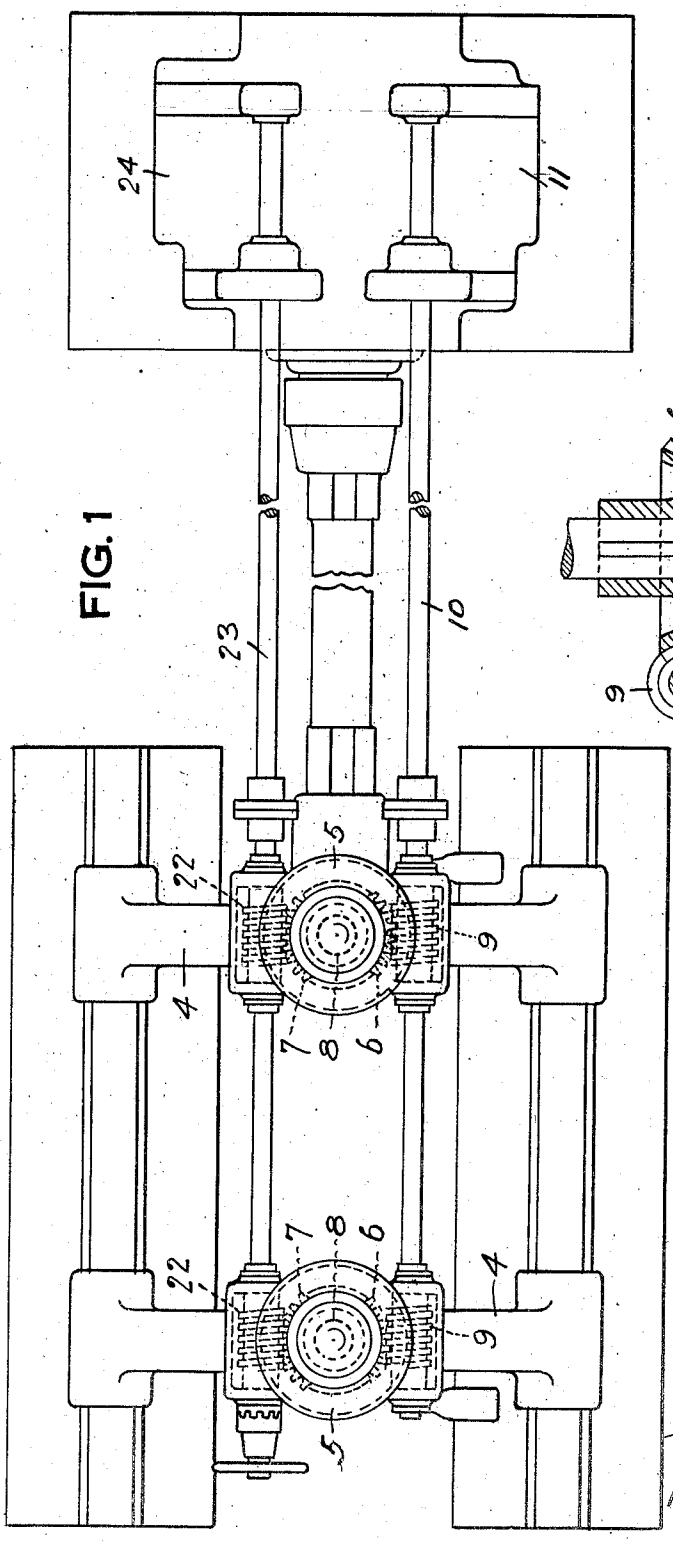


FIG. 1

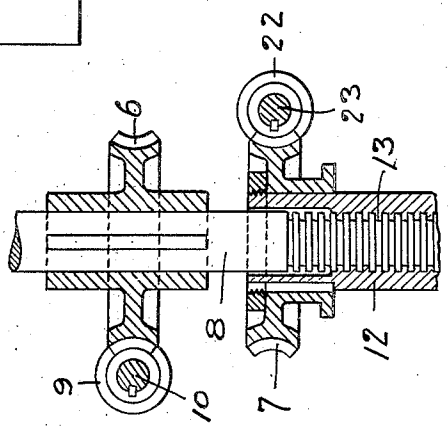


FIG. 3

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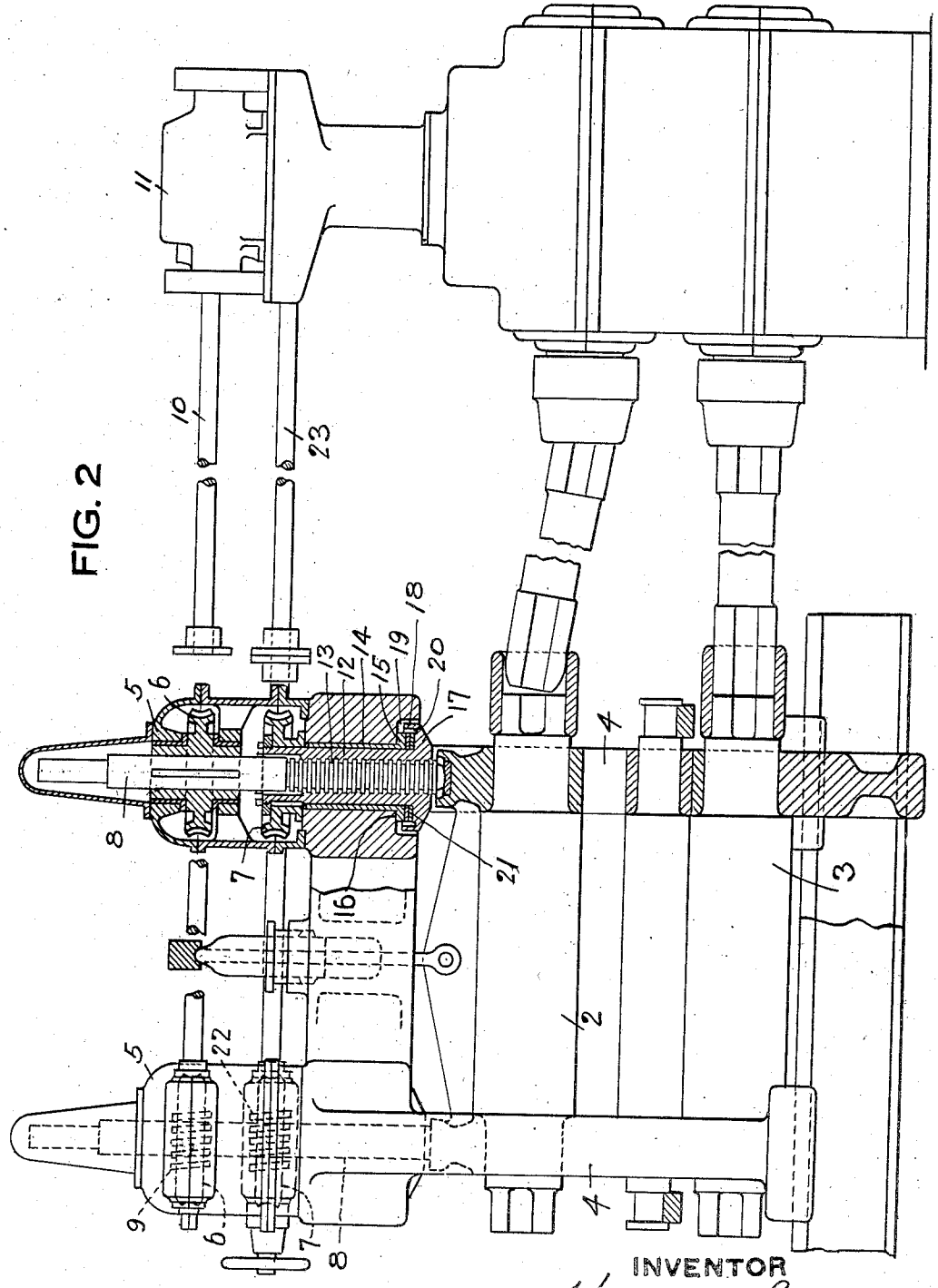
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FIG. 2



INVENTOR

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Attorneys

Patented May 12, 1925.

1,537,240

UNITED STATES PATENT OFFICE.

HARRY A. LEWIS, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ALAN D. WOOD, OF PHILADELPHIA, PENNSYLVANIA.

MILL SCREW-DOWN.

Application filed November 19, 1923. Serial No. 675,743.

To all whom it may concern:

Be it known that I, HARRY A. LEWIS, a citizen of the United States, and resident of Norristown, in the county of Montgomery and State of Pennsylvania, have invented a new and useful Improvement in Mill Screw-Downs; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what is known in the rolling-mill art as a screw-down, that is, mechanism for raising and lowering the top roll in a mill for rolling plates, sheets, bars, etc.

The main object of my invention is to provide a screw-down of this character with two or more speeds, so that the operation of lowering the roll may be greatly expedited, as compared with the present method, where the hydraulic rack and pinion is employed. In carrying out my invention, I revolve the nuts as well as the screw-bars, said nuts being at the present time screwed or keyed into place in the housings, thereby limiting the lowering of the roll to the speed of the screw-bar itself. Accordingly at present the speed is governed by the ability of the screw alone to make the necessary adjustments on the small drafts, and in many cases after a piece of metal has been completed it is necessary to wait a considerable time before the next piece can enter the rolls, due to the slow speed of the screw.

In the accompanying drawings, Fig. 1 is a plan view of an ordinary plate mill showing my invention applied thereto; Fig. 2 is a vertical elevation of same, partly in section, and Fig. 3 is an enlarged detail.

I have illustrated my invention in connection with an ordinary plate-mill, comprising the rolls 2 and 3, connected up in the ordinary manner of driving such rolls, but as said mechanism comprises no part of my invention, it is not necessary to refer to the same in detail.

The rolls 2 and 3 are mounted in suitable housings 4, and mounted on the housings are the castings 5, which form the housing-support for the worm-wheels 6 and 7. The upper worm-wheels 6 are keyed to the adjusting screws 8, and in order to drive each worm-wheel 6, a worm 9 is provided, mounted on the shaft 10, which is driven by the motor 11.

A worm-wheel 7 is keyed to the upper end of each nut 12, said nut having a threaded seat 13 to receive the screw 8. The nut 12 is contained within the sleeve 14 of suitable antifriction metal forming a bearing for said nut, and at the lower end of said sleeve 14 is the thrust-collar 15 which is adapted to engage the shoulder 16 in the housing. The lower end of the nut 12 is provided with the head 17, with the upwardly extending flange 18 which projects up into the recess 19 formed in the housing, and said flange forms a lubricant channel 20, to which oil or grease may be supplied in any suitable manner. Suitable washers 21 are interposed between the head 17 and the thrust-collar 15.

The worm 22 on the shaft 23 engages the worm-wheel 7, and said shaft 23 is driven by the motor 24.

The speed is obtained in opening up the mill by starting the motor 11 of the screws 8, in the upward direction and starting the motor 24, controlling the nuts 12 in the opposite direction. If the speed of these motors and the rotating of the gearing are the same, the time required in opening up the mill will be cut in half over the methods now commonly employed. These speeds can be increased still more by speeding up the nuts, and by decreasing the speed of the screws, fine settings are more readily obtained.

The revolving of the nuts is only to take place while the mill is not rolling, and the only resistance will be that obtained by the ordinary counterbalance weights. It will also be understood that a suitable electrical brake may be employed for the motor to hold the nuts in position.

What I claim is:

1. In a mill screw down, the combination with the rolls and housing, of a screw journaled in the housing for moving the rolls, means for driving the screw comprising a pair of driving elements disposed on opposite sides thereof, for effecting longitudinal movement of the screw, and means for permitting the independent driving of one element simultaneously with the driving of the other.

2. In a mill screw down, the combination with the rolls and housing, of an adjusting screw for the rolls, power means for driving the screw comprising a pair of reversing motors, and connections between said motors and screw for effecting independent driving

of the screw longitudinally an equal proportion by each motor when said motors are driven in unison.

3. In a mill screw down, the combination with the rolls and housing, of a nut journaled in the housing, a screw having threaded engagement with said nut, and means for rotating said nut and screw comprising a pair of like gear elements each adapted to move the screw longitudinally an equal proportion when driven alike and in unison and operative independently.

4. In a mill screw down, the combination with the rolls and housing, of a nut journaled in the housing, a screw threaded in said nut, means for rotating the screw comprising a worm gear slidably keyed thereto and including a driving worm, and a driving element for the nut comprising a worm wheel keyed to the nut and including a driving worm, the respective worms being disposed at opposite sides of the screw.

5. In a mill screw-down, the combination with the rolls and housing, of a screw, means for turning said screw, a nut engaged by said screw, means for turning said nut in the opposite direction from said screw, a sleeve surrounding said nut and having thrust engagement therewith, and a thrust-collar on said sleeve engaging the housing.

6. In a mill screw-down, the combination with the rolls and housing, of a screw, means for turning said screw, a nut engaged by said screw, means for rotating said nut in the opposite direction from said screw, a sleeve surrounding said nut, a thrust-collar on said sleeve engaging the housing, said housing having a recess formed therein, a head at the lower end of said sleeve having a lubricant receptacle, said head entering said recess and engaging said thrust-collar.

In testimony whereof I, the said HARRY A. LEWIS, have hereunto set my hand.

HARRY A. LEWIS.