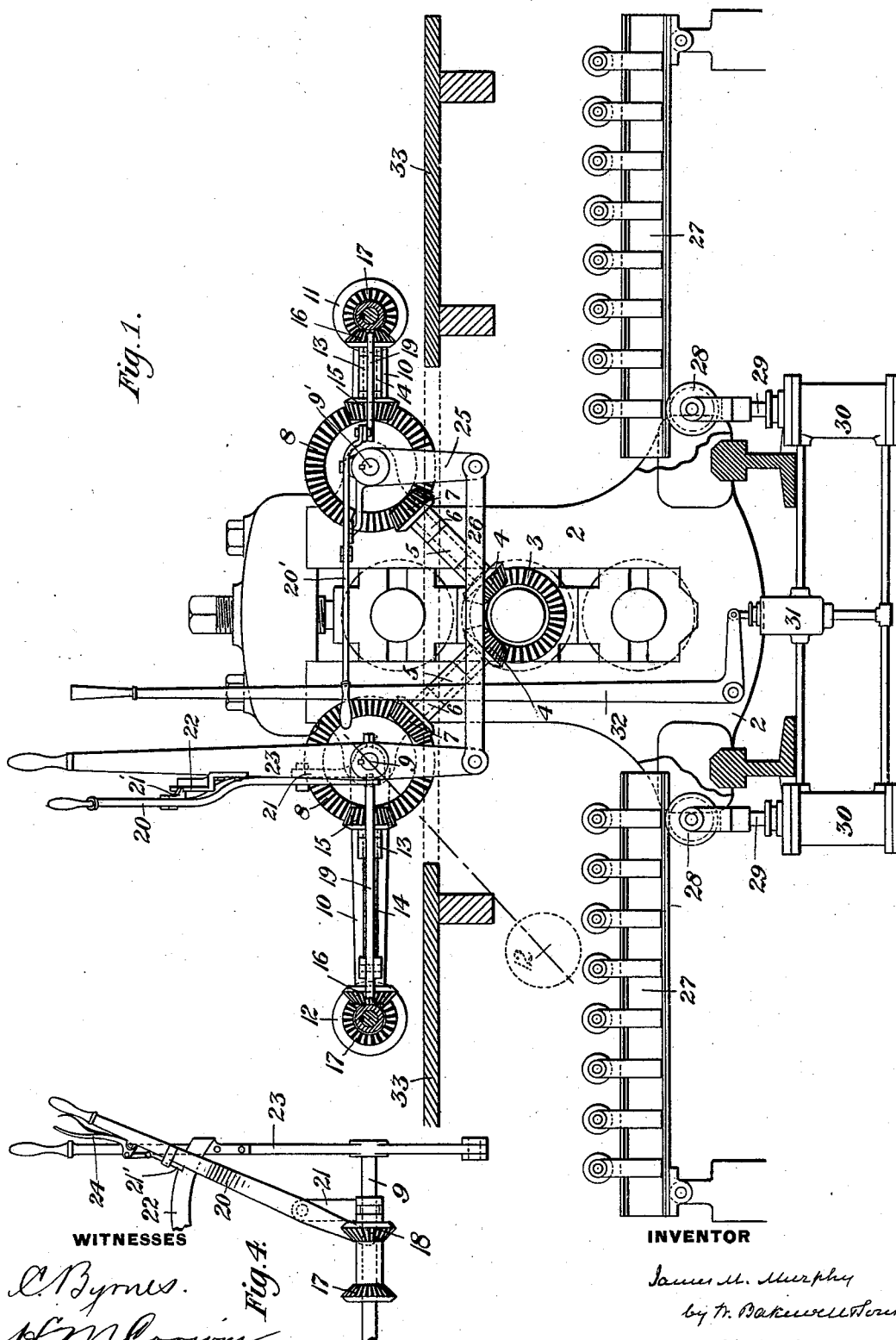


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FEED MECHANISM FOR ROLLING MILLS.

No. 506,060.

Patented Oct. 3, 1893.



(No Model.)

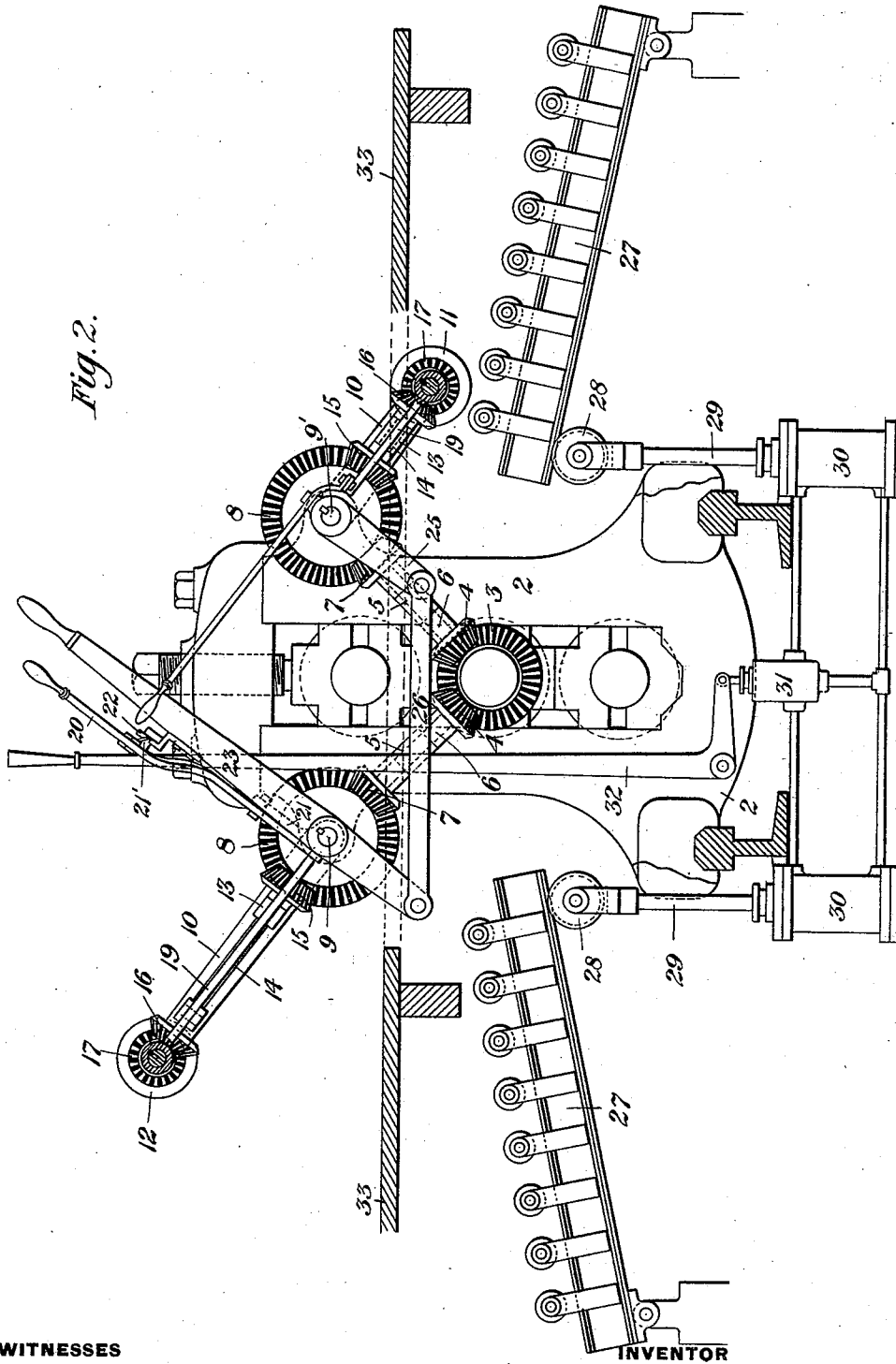
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WITNESSES

C. Byrnes.
H. McCorwin

INVENTOR

James M. Murphy
by W. Batewell Stone
his attorney

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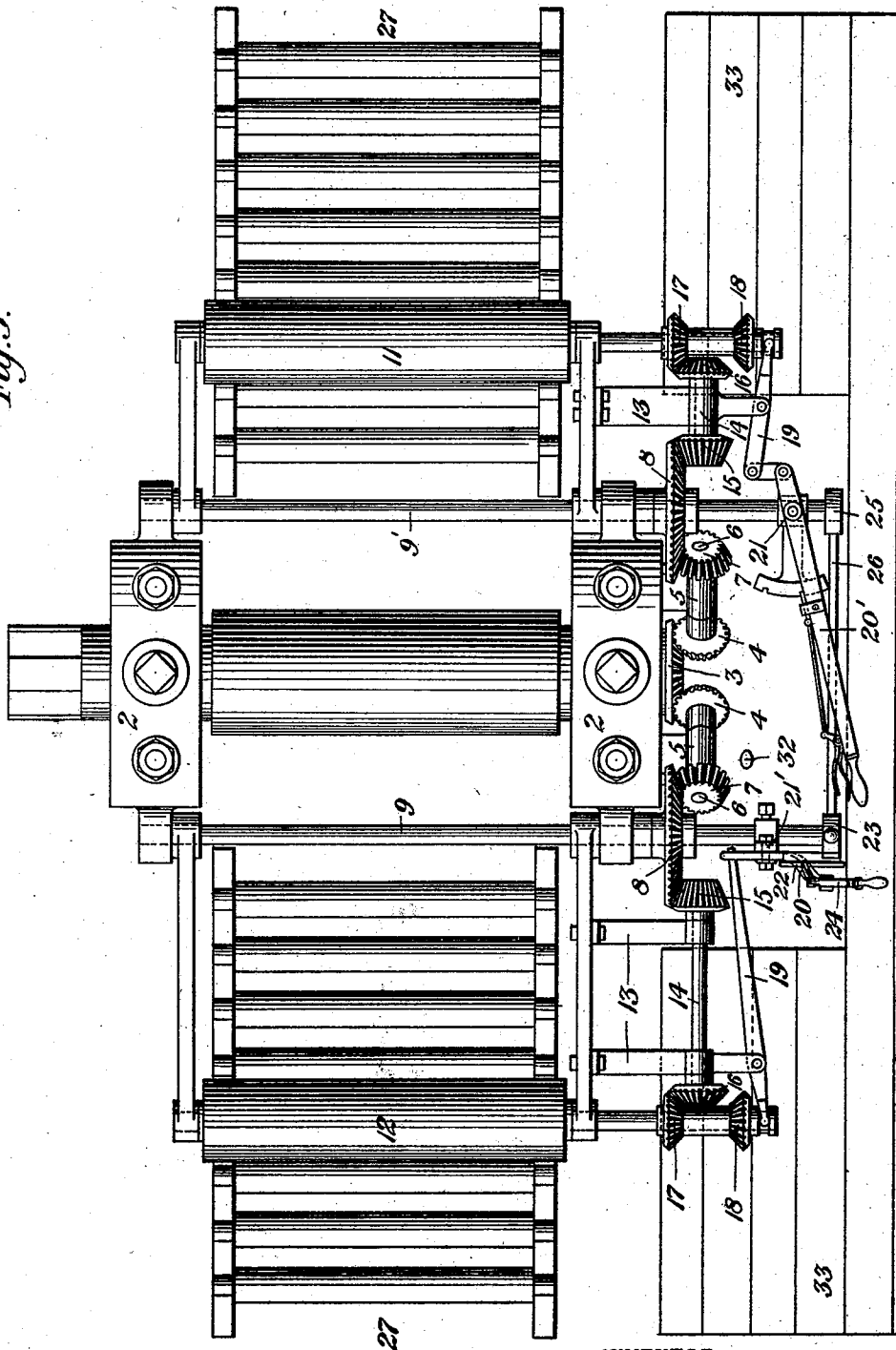
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Fig. 3.



WITNESSES

A. Byrnes.
H. M. Conner

INVENTOR

James M. Murphy
by H. Baker & Sons
his attorneys

UNITED STATES PATENT OFFICE.

JAMES M. MURPHY, OF PITTSBURG, PENNSYLVANIA.

FEED MECHANISM FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 506,060, dated October 3, 1893.

Application filed May 20, 1893. Serial No. 474,911. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. MURPHY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Feed Mechanism for Rolling-Mills, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of a three-high mill provided with my improved feed-mechanism. Fig. 2 is a similar view with the parts ready to direct the metal into the upper pass. Fig. 3 is a plan view of the device; and Fig. 4 is a detail view of a lever-locking mechanism.

My invention relates to the feeding devices employed in rolling mills for directing the metal between the rolls; and it consists in an auxiliary feed-roller carried upon pivoted lever arms above the usual feed-table rolls, and means for positively driving this auxiliary roller.

It also consists in the construction and arrangement of the parts as hereinafter more fully described and set forth in the claims.

In the drawings, 2 indicates the roll-housing of a three-high mill, the middle roll of which mill is provided with a bevel-wheel 3, with which intermesh two bevel-wheels 4 4, mounted upon inclined shafts 6, 6, carried in collars 5, 5, secured to the housing. At the opposite ends of the shafts 6 are secured bevel-wheels 7, which intermesh with bevel-wheels 8 loosely mounted upon shafts 9, 9', carried in integral extensions near the upper end of the housing. The shafts 9, 9', extend between the two housings, and upon them are secured supports 10, in the outer ends of which are trunnioned the auxiliary feed-rollers 11 and 12. Upon arms 13, projecting from the supports 10, are carried collars, through which pass the short shafts 14 carrying at one end bevel-wheels 15 intermeshing with bevel-wheels 8, and at the other bevel-wheels 16. Upon the extended shafts of rolls 11 and 12 are splined two connected bevel wheels 17 and 18, either of which may be thrown into gear with wheel 16 by means of a lever 19, pivoted in an extension of arm 13, which lever is operated by a lever 20 pivoted in a standard 21 secured to the shaft 9. Upon the lever 20 is carried a spring tooth 21' which engages suitable notches in

a segmental plate 22 carried upon a lever 23 rigidly secured to the shaft 9, the spring tooth being operated by a handle 24. A short lever-arm 25, keyed to the shaft 9', is connected to the lever 23 by a link 26, and it is evident that by operation of the lever 23 the roller 12 may be lowered into operative position, as shown by dotted lines in Fig. 1, or raised and the roller 11 brought into operation as in Fig. 2, in either case power being transmitted from the central roll for the positive rotation of the feed-rollers. The direction of rotation of either feed-roller may be reversed, if desired, by operating the lever 19, thus throwing either bevel-wheel 17 or 18 into gear. The segmental plate 22 for the right-hand lever 20' is secured to a projection from the shaft 9', and it will be seen from Fig. 1 that when the lever 23 is in vertical position, the lever 20' will be horizontal. The feed-tables 27 are pivoted at their outer ends, as shown, while their inner ends are supported upon friction rolls 28 carried at the ends of the plungers 29 of hydraulic cylinders 30. A valve 31 controls the admission of motive fluid to these cylinders, and this valve is operated by a long bell-crank lever 32, having a handle adjacent to the lever 23. The operator stands upon a suitable platform 33, and has full control of all the parts through the levers within easy reach.

The operation is as follows: The parts being in the position of Fig. 1, the handle 23 is operated to lower the feed-roller 12 to a position adjacent to the feed-table. This feed-roller being positively driven forces the metal into the rolls, whence it emerges upon the opposite table. The feed-rollers then being thrown into the position of Fig. 2, and the tables raised, the roller 11 drives the metal between the upper and middle rolls. The table upon which it is received then being lowered, these operations are repeated until the rolling is completed. If the piece sticks in the rolls, or difficulty is found in withdrawing it upon the tables as often happens after it has been somewhat elongated, either roll 11 or 12, as necessary, is reversed by the lever 20 or 20', and being lowered into contact with the metal draws it out upon the table.

The advantages of the mechanism will be apparent to those skilled in the art, since the

metal is positively fed to both upper and lower passes and if necessary drawn from either pass. There being a gearing connection between the feed rollers and the middle roll, there can be no slipping of the feed rolls in any position to which they are swung, and a single operator has complete control of the entire mechanism.

Many variations may be made in the form and arrangement of the parts without departure from my invention, since

What I claim is—

1. The combination with a rolling-mill, of a feed-table therefor, a swinging feed-roll above the table, and arranged to operate in conjunction with either pass, and actuating connections between the feed roll and the working rolls of the mill; substantially as described.

2. The combination with a rolling mill, of a feed table, an auxiliary feed roll mounted upon pivoted arms above the feed-table, means for swinging the arms independently of the feed table, and gearing connecting the feed roll and rolls of the mill; substantially as described.

3. The combination with a rolling mill and its feed table, of a bevel gear-wheel driven by its rolls, an auxiliary feed-roll carried upon pivoted arms above the feed-table, and bevel-gear connections between the feed roll and the said bevel gear-wheel; substantially as described.

4. The combination with a three-high mill and its feed tables, of auxiliary feed rolls carried upon pivoted arms above said tables,

means for tilting the arms into different positions, independently of the feed-tables, and means for positively rotating the feed rolls in all positions; substantially as described.

5. The combination with a three-high mill and its feed tables, of auxiliary feed rolls carried upon pivoted arms above said tables, means for tilting the arms into different positions, and gearing connections between the feed rolls and rolls of the mill; substantially as described.

6. The combination with a three-high mill and its feed tables, of auxiliary feed rolls carried upon pivoted arms above said tables, connections between the arms arranged to raise one feed roll as the other lowers, and means for positively driving the feed rolls in adjusted positions; substantially as described.

7. The combination with a three-high mill and tilting feed-tables therefor, of connected tilting feed-rolls above said tables, and means for rotating said feed rolls in their various positions; substantially as described.

8. The combination with a three-high mill and its feed-tables, of connected swinging feed-rolls above the tables, and a lever arranged to swing both feed-rolls simultaneously; substantially as described.

In testimony whereof I have hereunto set my hand.

JAMES M. MURPHY.

Witnesses:

H. M. CORWIN,
C. BYRNES.