

(No Model.)

J. R. DAVIES.
ROLL PINION ATTACHMENT.

No. 563,261.

Patented July 7, 1896.

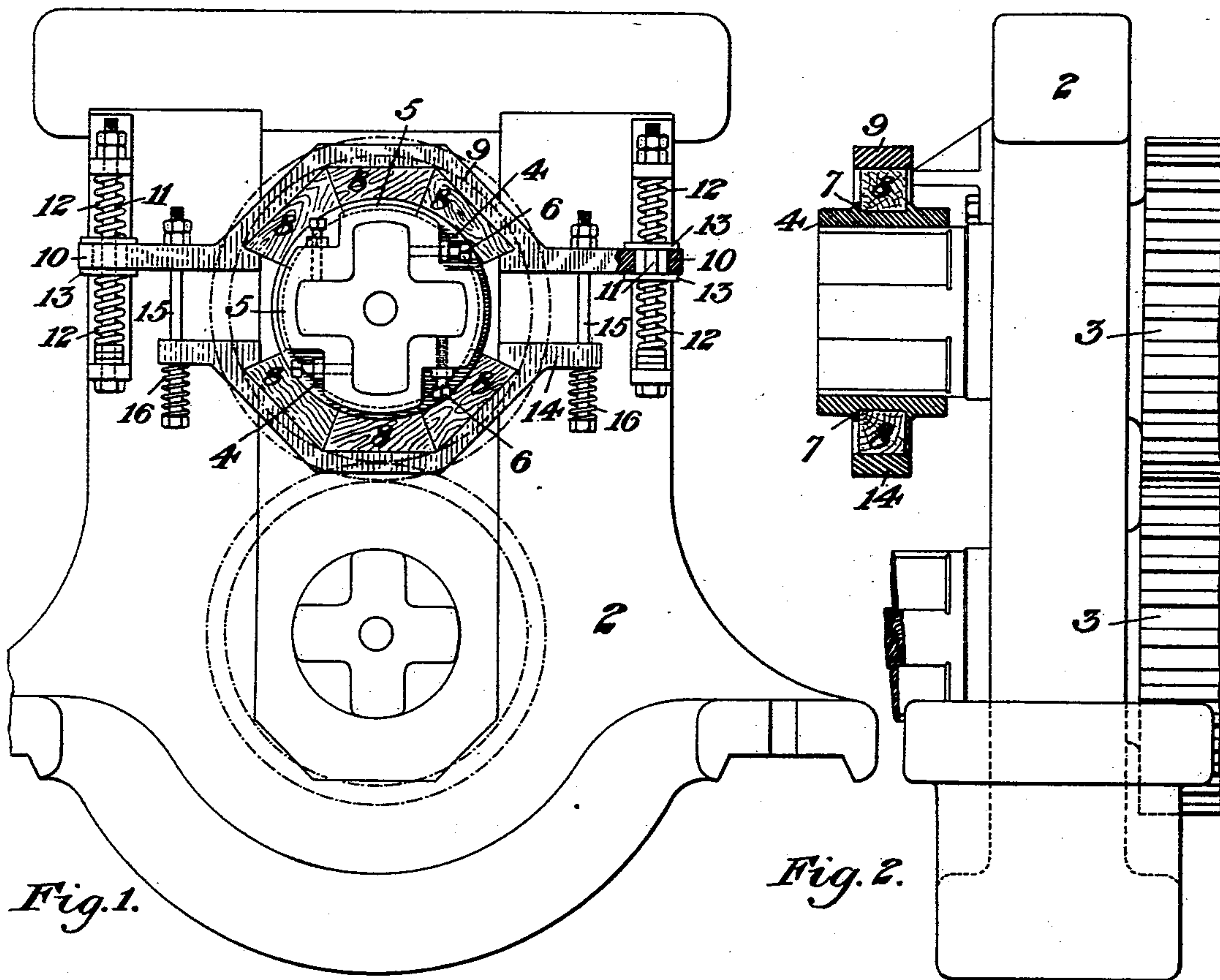
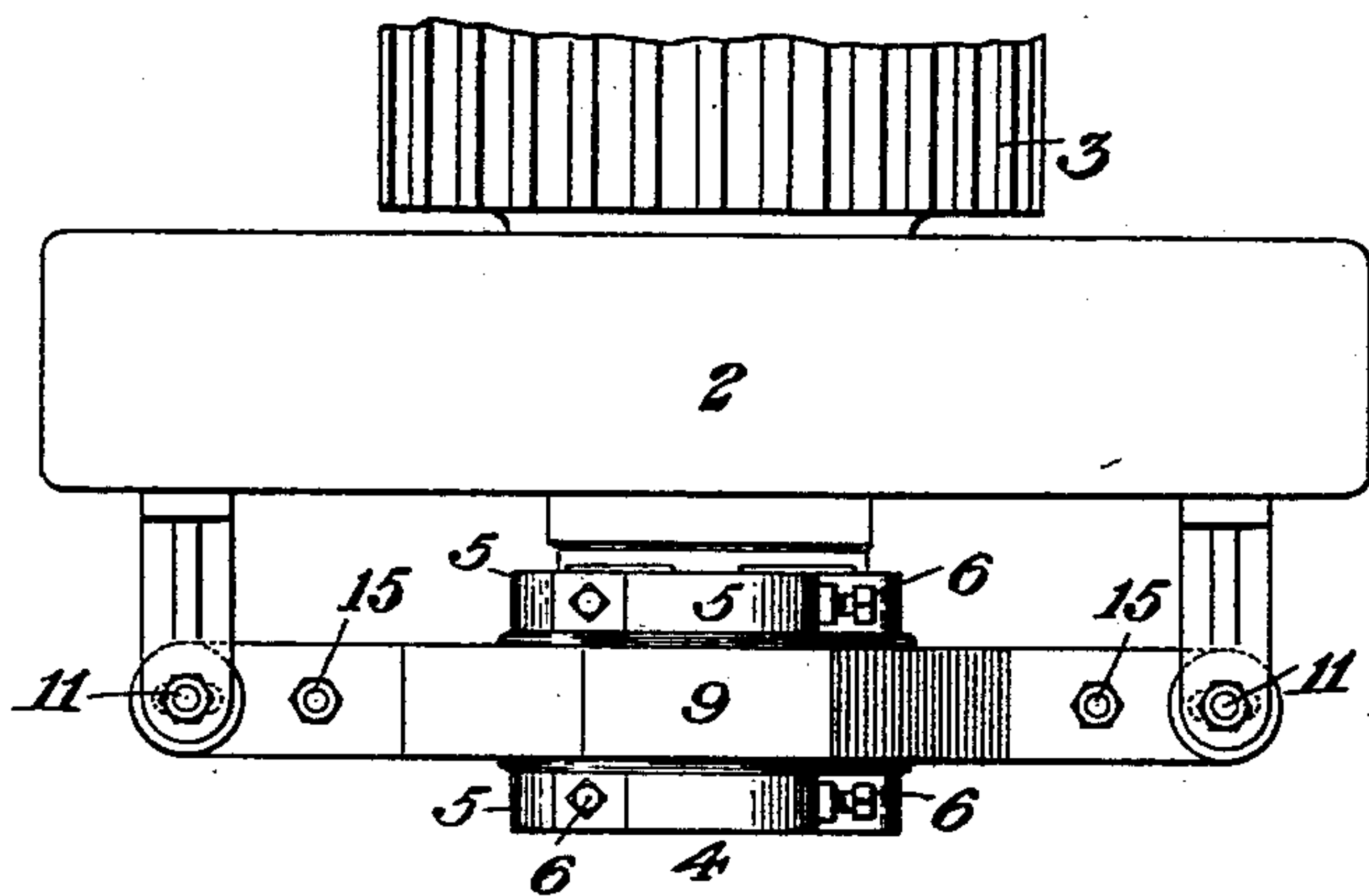


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN R. DAVIES, OF DUQUESNE, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JOHN JARRETT, OF PITTSBURG, AND JOHN EDWARDS, OF HOMESTEAD, PENNSYLVANIA.

ROLL-PINION ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 563,261, dated July 7, 1896.

Application filed August 30, 1895. Serial No. 561,014. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. DAVIES, of Duquesne, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Roll-Pinion Attachments, 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 pair of roll-pinions provided with my attachment. Fig. 2 is a side elevation, partly broken away; and Fig. 3 is a top plan view.

My invention relates to the pinions employed for driving two-high reversing-mills for rolling metal; and it consists in an attachment for the pinions which shall prevent backlash and breaking of the pinion-teeth. Heretofore in the use of these driving-pinions, as the engine is connected to the lower one only, in the rapid stopping and starting of the lower pinion the weight and momentum of the upper pinion cause the constant breaking of teeth therein. Thus when the lower pinion is stopped, the momentum of the upper pinion tends to drive it on and to break the engaging teeth. Similarly, when the lower pinion is started, its teeth strike the engaging teeth of the upper pinion with great force, and on account of the great weight of the pinion the teeth often break before it starts to rotate.

My invention entirely does away with this difficulty; and it consists in providing upon the shaft of the driven pinion some device which, when the pinion is rotated in either direction, acts in opposition to a power mechanism, such as a motor, a spring, or some similar device.

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, in which similar numerals indicate corresponding parts, 2 represents the housing of a pair of pinions, and 3 3 the pinions supported therein. One end of the lower pinion is connected to and driven by the engine, while the opposite ends of both pinions have the usual wabblers connections to the rolls to be driven. Upon the cross-shaped projecting neck of the engine end of the up-

per pinion I secure a collar or ring 4, this collar having side projecting flanges 5, which fit neatly over the cross-shaped end and are adjustably secured thereto by set-screws 6. In the outer face of the collar is provided an annular recess 7, into opposite portions of which recess fit wooden blocks 8. The upper series of these blocks is secured within the yoke or frame 9, having projecting slotted end portions 10, the frame being held in place by bolts 11, which extend through the end slot therein, and are secured to the housing. Surrounding the bolts, upon each side of the yoke, are spiral springs 12, which bear upon intermediate plates 13 and normally hold the frame in a central horizontal position. The lower series of wooden blocks are secured in a yoke 14, which yoke is fastened to the upper yoke by bolts 15, suitable springs 16 being placed between the heads of the bolts and the lower yoke, so as to afford a yielding pressure upon the bearing-blocks. The tension of the springs upon both sets of bolts is easily regulated by the nuts upon these bolts.

The action of the device is as follows: When the lower pinion is actuated by the engine in either direction, the upper pinion begins to turn and turns with it the yoke 9, throwing it into an angular position, the slots in the end of the yoke allowing its turning a certain amount. This action compresses the spiral springs, and, as they act against or in opposition to the rotation of the pinion, they tend to force the teeth of the upper pinion into constant contact with those of the lower, thus preventing backlash. When the engine stops and starts in the opposite direction in the reversal of the rolls, the springs press the teeth of the upper pinion firmly against those of the lower, and the moment the lower pinion starts in the opposite direction the upper pinion starts with it, the springs performing this action of starting in their efforts to throw the upper yoke into normal position. As soon as the upper pinion has rotated a portion of a revolution in the opposite direction, the other sets of spiral springs are operated in the same way and perform the same functions as above described.

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

breaking of the teeth from the driving-pinions of rolling-mills, which is a frequent occurrence and necessitates serious delays, is prevented, as also the rapid wear of these teeth, while
5 the device is simple, cheap, and easy of application.

Many changes in the particular power mechanism, against which the pinion acts, and in the general form and arrangement of the parts
10 may be made without departing from my invention, since

What I claim is—

1. The combination with a pair of roll-driving pinions, of a movable brake mechanism,
15 arranged to press upon the shaft of the driven pinion and be moved by its rotation, and a yielding power mechanism connected with the brake mechanism, and arranged to normally hold it in a certain position, substantially as
20 described.

2. The combination with a pair of roll-driv-

ing pinions, of a collar secured to the neck of the driven pinion, a movable brake mechanism arranged to press upon the collar, and springs arranged to normally hold the brake
25 mechanism in a certain position; substantially as described.

3. The combination with a pair of roll-driving pinions, of a collar secured to the neck of the driven pinion, a yoke having a brake por-
30 tion bearing upon the collar, bolts passing through the slotted ends of the yoke, and springs surrounding the bolts and arranged to hold the yoke in an intermediate position upon the bolts; substantially as described.
35

In testimony whereof I have hereunto set my hand.

JOHN R. DAVIES.

Witnesses:

GEORGE F. PITTS,

ARTHUR B. PITTS.