

(No Model.)

J. F. BUDKE.
COUPLING FOR ROLLS.

No. 573,203.

Patented Dec. 15, 1896.

FIG. 2.

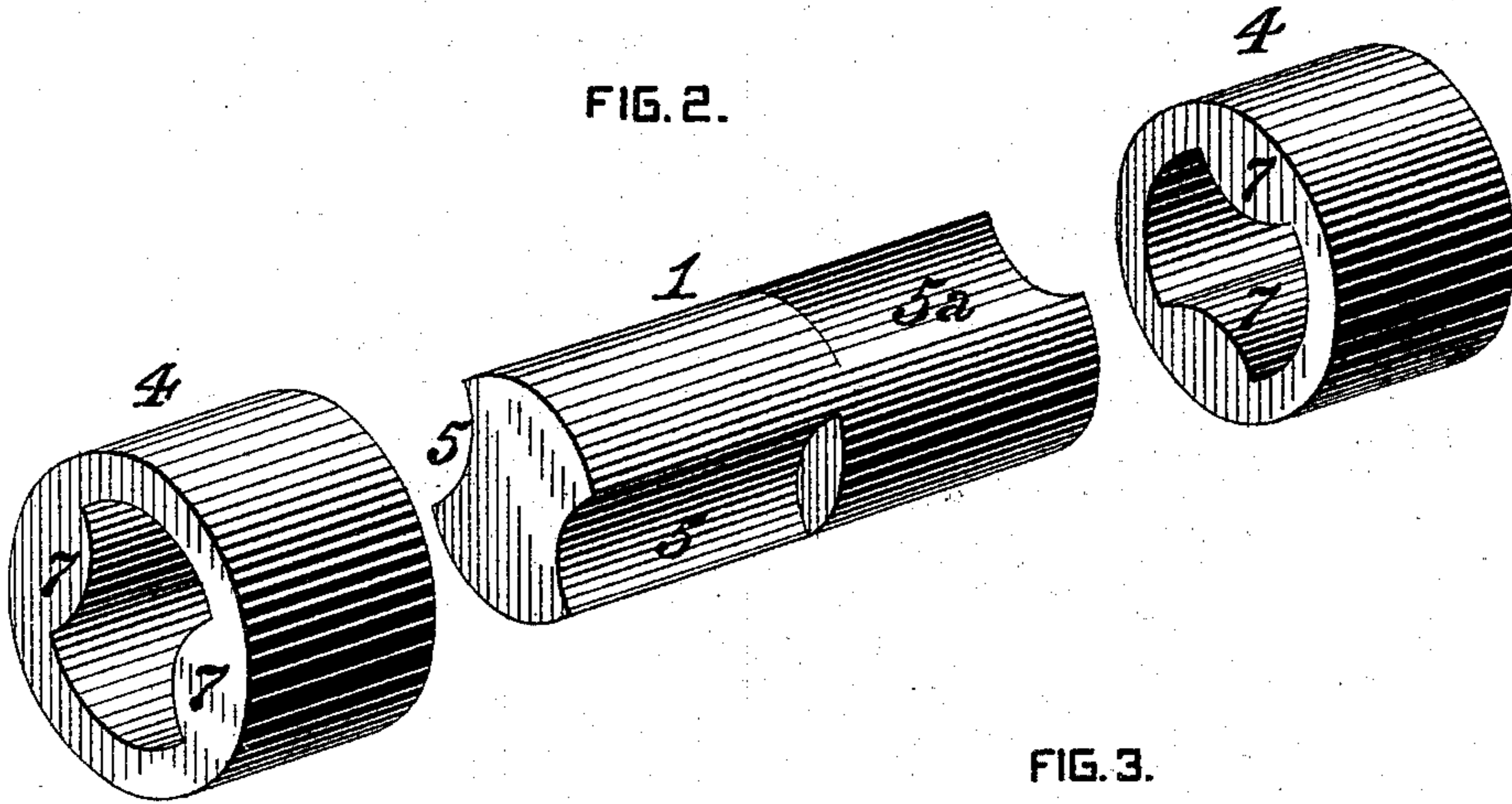


FIG. 3.

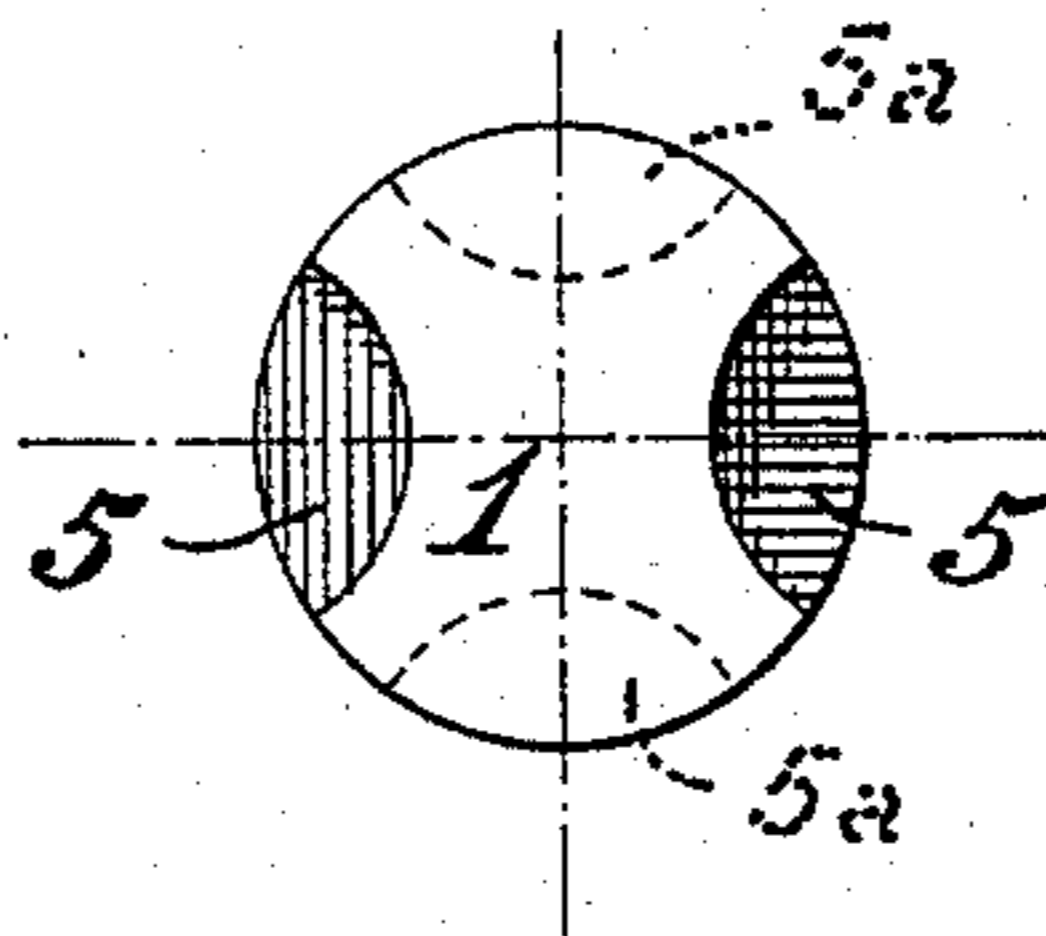


FIG. 1.

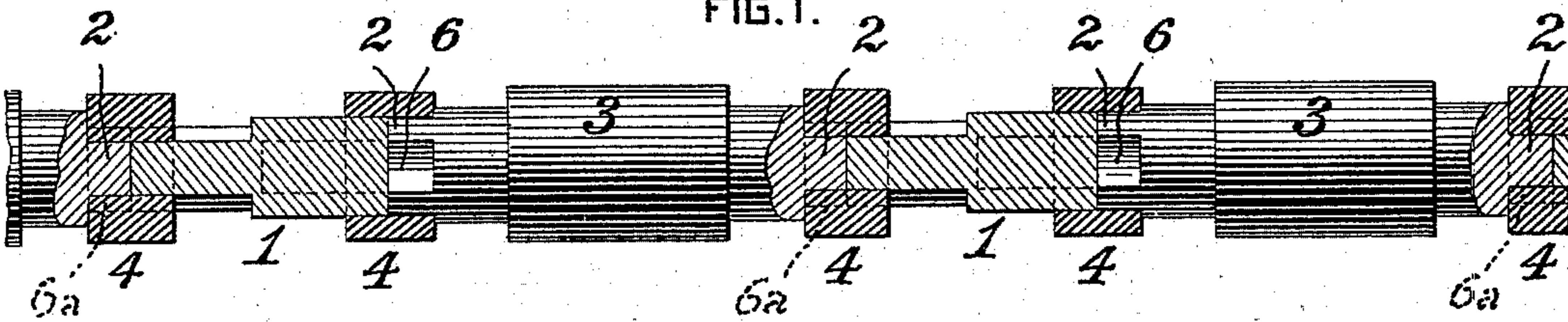
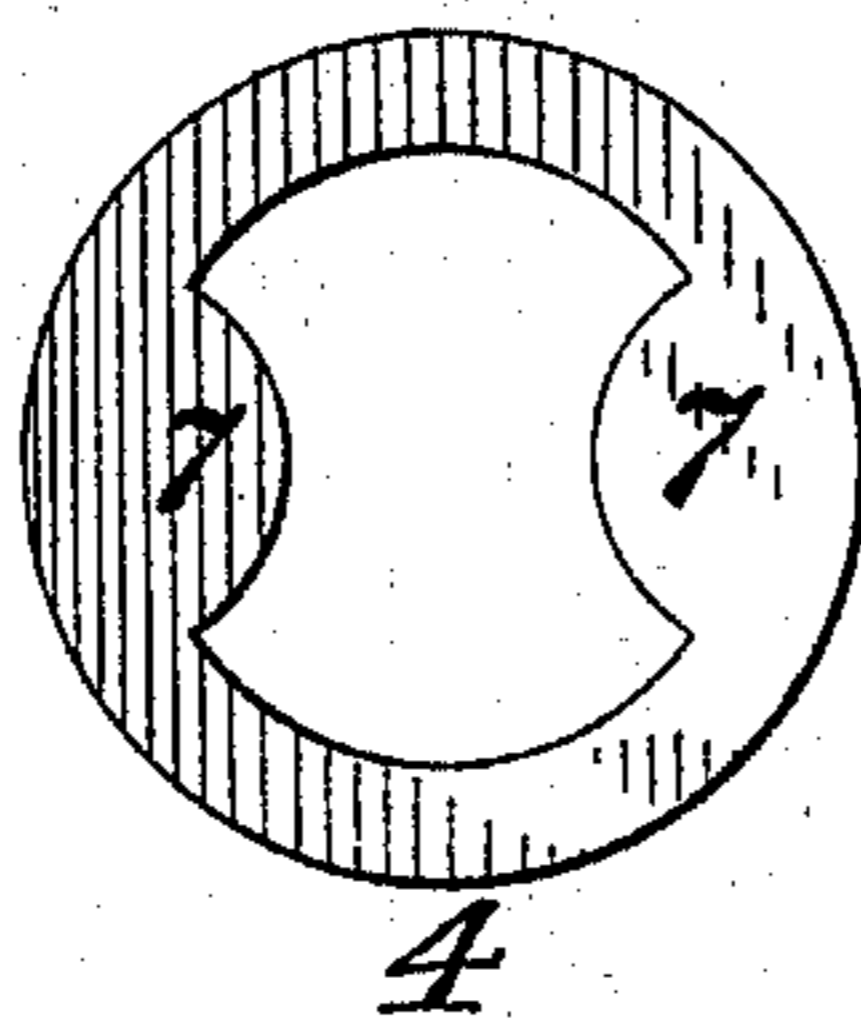


FIG. 4.



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN F. BUDKE, OF CANNONSBURG, PENNSYLVANIA.

COUPLING FOR ROLLS.

SPECIFICATION forming part of Letters Patent No. 573,203, dated December 15, 1896.

Application filed August 19, 1895. Serial No. 559,708. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BUDKE, a citizen of the United States, residing at Cannonsburg, in the county of Washington and State of Pennsylvania, have invented or discovered a certain new and useful Improvement in Couplings for Rolls, of which improvement the following is a specification.

My invention relates to means for detachably coupling members of a train of rolls for rolling metal; and its object is to prevent the objectionable backlash and breakage of wabblers, spindles, and coupling-boxes which are experienced in the operation of rolls connected by the couplings ordinarily employed.

To this end my invention, generally stated, consists in a spindle which is longitudinally recessed from each of its ends toward its middle, the central planes of the recesses of the opposite ends being, respectively, radially angular; also in the combination of a spindle, as specified, coupling-boxes, each having internal projections adapted to engage the recesses of one end of the spindle, and rolls having wabblers which are recessed, respectively, corresponding with the ends of the spindle.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a view, partly in elevation and partly in longitudinal central section, of a portion of a roll-train, illustrating an application of my invention; Fig. 2, an isometrical view of a spindle and coupling-boxes in accordance with my invention; Fig. 3, an end view in elevation of a spindle, and Fig. 4 a similar view of a coupling-box.

In roll-couplings as constructed prior to my invention, so far as my knowledge and information extend, the wabblers and the ends of the spindles are each provided with three or four (ordinarily four) longitudinal recesses and the coupling-boxes with a corresponding number of internal projections, the recesses of the wabblers at one end of each roll and those at one end of each spindle being in the same radial planes as those of the other. With this construction the results of backlash are found to be marked and objectionable by reason of the fact that the sets of connecting coupling-surfaces of the several rolls of the

train being disposed in the same longitudinal planes, respectively, and there being a certain amount of play or freedom between the normally-abutting surfaces their periods of inaction due to such play are practically simultaneous throughout and are intermitted between those of their action when in contact. In other words, the entire set of surfaces which should be in operative contact are at times out of contact, and shocks, which frequently cause breakage involving much expense and loss of time, are, as is familiar in practice, of frequent occurrence and are caused by the sudden contact throughout the entire train of the surfaces through which it is driven.

In the practice of my invention the spindles 1 are, as in ordinary practice, interposed between the end portions or wabblers 2 of the rolls 3 of a train employed in rolling metal and are connected with and disconnected from the rolls by coupling-boxes 4, which are fitted to slide longitudinally on the spindles and wabblers into and out of position for holding the same in relative connection and are provided with longitudinal internal projections engaging substantially corresponding recesses in the spindles and wabblers. Longitudinal recesses 5, one or more, of segmental transverse section are formed in the periphery of each of the spindles 1, extending from one end thereof toward the middle for a distance sufficient to admit of the required longitudinal movement of the coupling-box 4 in coupling and uncoupling, and the opposite end of the spindle is provided with a similar and similarly-extending recess or recesses 5^a, the longitudinal central plane of the recesses 5^a being respectively located at right angles to that of the recesses 5.

In the instance shown two longitudinal recesses are provided for each end of the spindle, and these are diametrically opposite, so that they have a common longitudinal central plane. While I consider this number of recesses desirable, by reason of the greater body of metal and consequent strength which is provided, I do not limit myself thereto, as one, three, or even four recesses may be made at each end of the spindle, if desired, without departure from my invention, the only

essential being that they shall be in relatively different radial planes, or "staggered," at the opposite ends, respectively, of the spindles.

The wabblers 2 of each of the rolls 3 are similarly recessed—that is to say, the wabbler at one end of the roll has a longitudinal recess or recesses 6 and that at the other has a similar recess or recesses 6^a, the longitudinal central plane of the recesses 6^a being, as in the case of the spindles, located at right angles to that of the recesses 6. The relative circumferential location of the opposite end recesses of both the spindles and the wabblers of each roll—that is to say, in different radial planes, respectively, at opposite ends of the spindles and rolls—is plainly indicated in Fig. 3.

The coupling-boxes 4 are hollow cylindrical members of proper internal diameter to fit easily over the wabblers and spindles, and each of them is provided with longitudinal projections 7, corresponding in number and substantially in transverse section with the recesses of the wabblers and spindles, so as to enter and fit freely therein when the coupling-box is moved into position to connect, in the usual manner, one of the wabblers of a roll with the adjacent end portion of a spindle. By the alternate change of circumferential location of the recesses at the opposite ends of the rolls and of the spindles the coupling-surfaces are stepped, staggered, or alternated relatively to the longitudinal central plane of the train of rolls; and it has been found in practice that by such construction the amount and objectionable results of backlash are materially reduced as compared with the constructions heretofore employed, inasmuch as one or more pairs of coupling-surfaces in the train will always be in or practically in contact, and therefore the shocks occasioned by making contacts simultaneously throughout the train, as in prior constructions, are not caused in the operation of my improvement. It will also be seen that where only two recesses are provided at each end of the spindles and rolls the quantity of metal between the edges of the recesses of the spin-

dles and wabblers is greatly increased, and liability to breakage at these points, which has heretofore proven a fruitful source of expense and delay, is effectually guarded against.

While I have described and shown the recesses at the opposite ends of the spindles and rolls as having their central planes located at right angles to each other, I do not desire to limit myself to a construction in which this specific angularity is presented, as it is obvious that it may be varied to a greater or less degree without departing from the spirit of my invention.

I claim as my invention and desire to secure by Letters Patent—

1. A spindle for coupling members of a train of rolls, having one or more longitudinal recesses, extending from each of its ends toward its middle, the central planes of the recesses of one end being, respectively, radially angular to those of the recesses of the other end, substantially as set forth.

2. A roll for use in a train for rolling metal, having one or more longitudinal recesses on each of its end portions or wabblers, the central planes of the recesses of one of the wabblers being, respectively, radially angular to those of the recesses of the other wabbler, substantially as set forth.

3. The combination, in a train of rolls for rolling metal, of a spindle having one or more longitudinal recesses extending from each of its ends toward its middle, the central planes of the recesses of one end being, respectively, radially angular to those of the recesses at the other end, rolls having their wabblers recessed correspondingly with the ends of the spindle, and coupling-boxes having internal projections adapted to engage the recesses of the spindle and wabblers, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN F. BUDKE.

Witnesses:

J. SNOWDEN BELL,
F. E. GAITHER.