

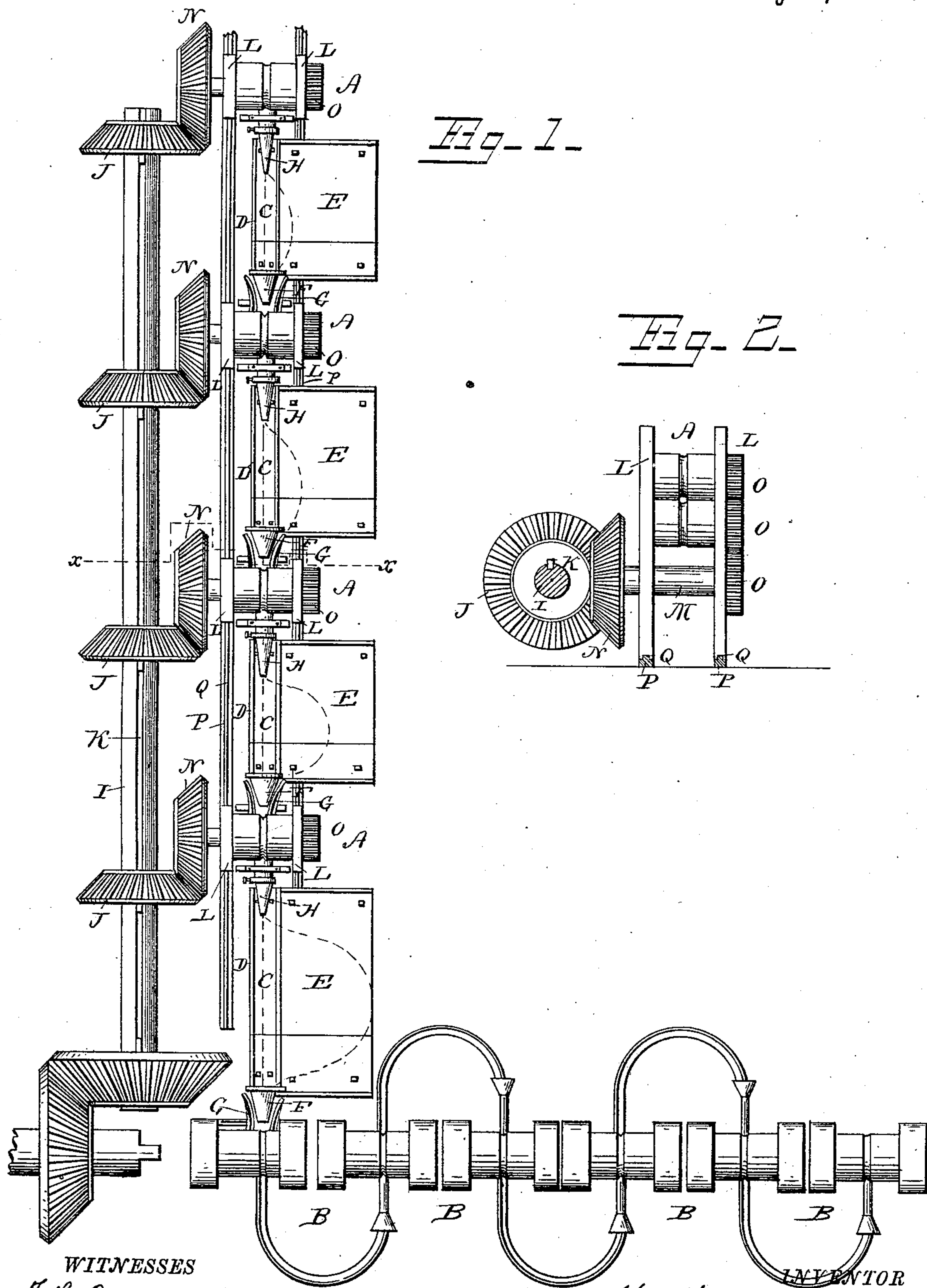
(No Model.)

2 Sheets—Sheet 1.

W. W. McCALLIP.
CONTINUOUS ROLLING MILL.

No. 277,044.

Patented May 8, 1883.



WITNESSES
F. L. Ourand
J. R. Little

INVENTOR
W. W. McCallip,
by A. Snow & Co. Attorneys

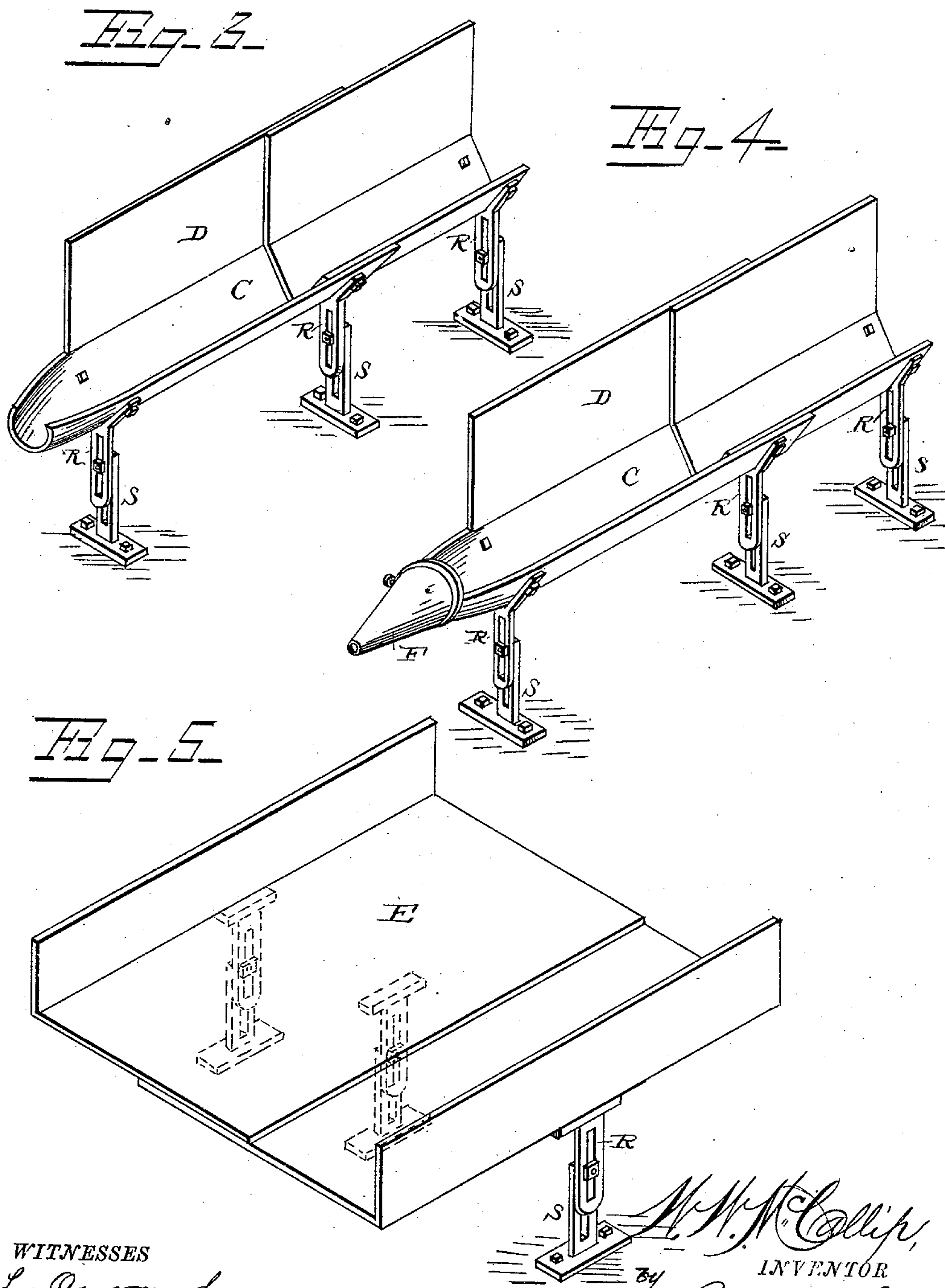
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J. L. Aurand
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W. W. McCallip,
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Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM W. McCALLIP, OF COLUMBUS, OHIO.

CONTINUOUS ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 277,044, dated May 8, 1883.

Application filed December 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. McCALLIP, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Continuous Rolling-Mill, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to rolling-mills; and its object is to provide an improved arrangement of a continuous set or train of rolls by which the billet may pass from set to set through the entire train without handling, thereby effecting a great saving of labor.

My invention consists in the improved construction and arrangement of parts by which this object is accomplished, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a plan view of a complete continuous train of rolls equipped with my improvements. Fig. 2 is a vertical sectional view on the line xx in Fig. 1. Fig. 3 is a perspective view of the open conductor detached. Fig. 4 is a perspective view of the same equipped with the delivering-tube, and Fig. 5 is a perspective view of the flanged billet-table detached.

The same letters refer to the same parts in all the figures.

Continuous rolling-mills have heretofore been constructed in which several sets of rolls have been placed in front of each other with any convenient form of gearing. It has always been customary, however, to place these sets of rolls very close to each other, and the overfeed or surplus which occurs between two such sets of rolls, and which is due to the rapid reduction of a billet or piece of metal in two passes at the same time, has been provided for in the diameter of the rolls, in the draft of the billet, and in the regulation of the speed of the rolls; but such difficulties and expense have been encountered in the old form of continuous mill on account of the overfeed, and the exact regulation of draft, diameter, and speed of the rolls required to overcome it, as to render this form of mill almost impracticable. These difficulties and objections are overcome by my invention, the construction and

operation of which I shall now proceed more fully to describe with reference to the drawings hereto annexed, in which—

A A represent the sets of rolls of the continuous train, and B B represent those of an ordinary repeating train which is placed at right angles to and which operates in conjunction with the continuous train A. The rolls of the latter are arranged in the usual manner parallel to each other, the several sets being placed in front of one another. The axes of the rolls of the repeating-train are arranged in a line with each other, the entire train being, as stated, at right angles to the train A. The sets of rolls constituting the continuous train are preferably located five feet or more apart, as occasion may require, so as to afford space between the sets for an open conductor, trough, or guide, (denoted in the drawings by letter C.) This "conductor," as it may properly be termed, consists simply of a suitably-constructed open trough or gutter-shaped box provided on its inner side with a flange, D, in order to prevent the billet from escaping in this direction.

E is a large flat table placed adjoining the unflanged outer side of the conductor C for the purpose of receiving and supporting the overfeed of the billet, as will be presently more fully described. The delivering end of the conductor is contracted, as shown, and provided with a funnel-shaped delivering-tube, F, for the purpose of entering the billet properly into the receiving-guide G of the next set of rolls. Each set of rolls is also provided with a delivering billet-guide, H, so constructed as to be capable of delivering the billet properly edged, as the oval and square passes may require. The construction of this delivering-guide, however, is not claimed herein, as it has already been made the subject of a separate application by me for Letters Patent.

Motion is communicated to the rolls of the train A from the longitudinal main shaft I by means of bevel-wheels J upon the latter. Said main shaft has a key-seat, K, extending over its entire length, so that the bevel-wheels J may be readily adjusted at any desired place. The rolls A are by preference arranged in three high housings, L, the lower bearings of which are occupied by counter-shafts M, having bevel-

wheels N, engaging those upon the main shaft. By this construction I avoid the necessity of securing the bevel-wheels upon the necks of the rolls, motion to which is communicated by means of ordinary gear-wheels, O. The housings L are to be arranged or mounted upon a suitable longitudinal bed-plate, P, parallel to the main shaft, and provided, if desired, with suitable guide-flanges, Q. By this arrangement, when a short billet is to be worked, the housings or sets of rolls may be moved as closely together as may be desired or necessary in order to properly work the billet. The bevel-wheels J, being adjustable upon the main shaft, as described, may be readily moved so as to conform to such adjustment.

The troughs or conductors and the flanged tables are provided on their under sides with vertically-slotted brackets R, by which they are vertically adjustable in the feet or standards S, of which two or more may be used under each of the said conductors and tables. I also prefer to make each of the said conductors and tables in two pieces, one overlapping the other, as shown in the drawings, in order that they may be expanded or contracted, so as to correspond with the space between the sets of rolls.

In the construction and arrangement of the rolls of the repeating train no novelty is herein claimed. They are to be equipped with the automatic repeating mechanism patented to myself on the 23d day of October, 1877, so as to be capable of passing a billet from one end of the train to the other without the aid or attendance otherwise necessary. The first pass or set of rolls of the train B is to be equipped with a receiving-guide, G, of suitable construction to receive the billet from the last set of rolls in the train A.

I would have it understood that although I have described the repeating train B as being arranged at right angles to the train A, this particular position is not necessary or essential to the successful operation of the device. The two trains or sets of rolls may be placed in any desired position in relation to each other to form a continuous train.

The operation and advantages of my invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. The billet, as it passes from each set of rolls in the train A, is conveyed by the conductor C to the next set. Any overfeed or surplus occurring between the different sets of rolls is allowed to escape out upon the flanged table E, where it rests during operation. The flange D upon the outer side of the conducting-trough prevents the overfeed from escaping in the wrong direction. By having the different sets of rolls placed the required distance apart, and permitting the overfeed to escape as described, I obviate the necessity of exact regulation of diameter, draft, and speed of the rolls, with the exception that the speed of one set of rolls

should not so much exceed that of the preceding set as to stretch or separate the billet. My improvement, in fact, would work successfully if uniform speed and diameter of the rolls were employed; but as it is necessary to gear each set of rolls separately, it would be advantageous to provide for part of the overfeed in the gearing, allowing the difference to escape out upon the flanged table.

The main driving-shaft of the continuous train A may be propelled in any convenient manner by power supplied by the engine running the repeating train, or by an engine erected specially for the purpose. It is designed, however, where mills have the ordinary train and sufficient power in the engine driving it, to add the rolls constituting the continuous train, which may be done at comparatively small expense, thus doing away with the roughers and getting the full advantages of a continuous and labor-saving train without much outlay, the engine, ordinary train, and other equipments of the plant being already on the ground; or the continuous section can be used alone, if desirable.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. The combination, with a rolling-mill, of the herein-described open trough or conductor located intermediately between two sets of rolls, and provided on one side with a side guard or flange adapted to deflect the overfeed of the billet in the opposite direction, as set forth.

2. The combination, with a rolling-mill, of a platform or table located intermediately between two sets of rolls to receive and support the overfeed of the billet, substantially as set forth.

3. The combination, with a rolling-mill, of an open trough or conductor and a supporting table or platform arranged adjoining each other between two sets of rolls, substantially as set forth.

4. In a continuous rolling-mill of the class described, the combination, with the rolls, of the intermediately-arranged conducting-troughs and supporting tables or platforms vertically adjustable upon suitable feet or supports, substantially as set forth.

5. In a continuous rolling-mill of the class described, the combination, with the main shaft having a key-seat extending throughout its entire length, and the bevel-wheels mounted adjustably upon the same, of the sets of rolls mounted adjustably upon a suitable bed-plate, the latter being parallel to the main shaft, substantially as set forth.

6. In a continuous rolling-mill of the class described, the combination of the main shaft having a key-seat extending throughout its entire length, the bevel-wheels adjustable upon the same, the sets of rolls mounted adjustably upon a bed-plate parallel to the main shaft, and the conducting-troughs and supporting-tables arranged between the sets of rolls, and

constructed each of two sections, one overlapping the other, so that they may be extended or contracted at will, substantially as set forth.

5 7. In a continuous rolling-mill of the class described, the combination of the rolls, the intermediately-arranged flanged conducting-troughs and supporting-tables, and the delivering and receiving guides, all arranged and operating substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM WATERMAN McCALLIP.

Witnesses:

GILBERT H. STEWART,
IRA H. CRUM.