

S. C. FOX.

ROLLS AND CONDUCTORS FOR ROLLING METALS.

No. 177,491.

Patented May 16, 1876.

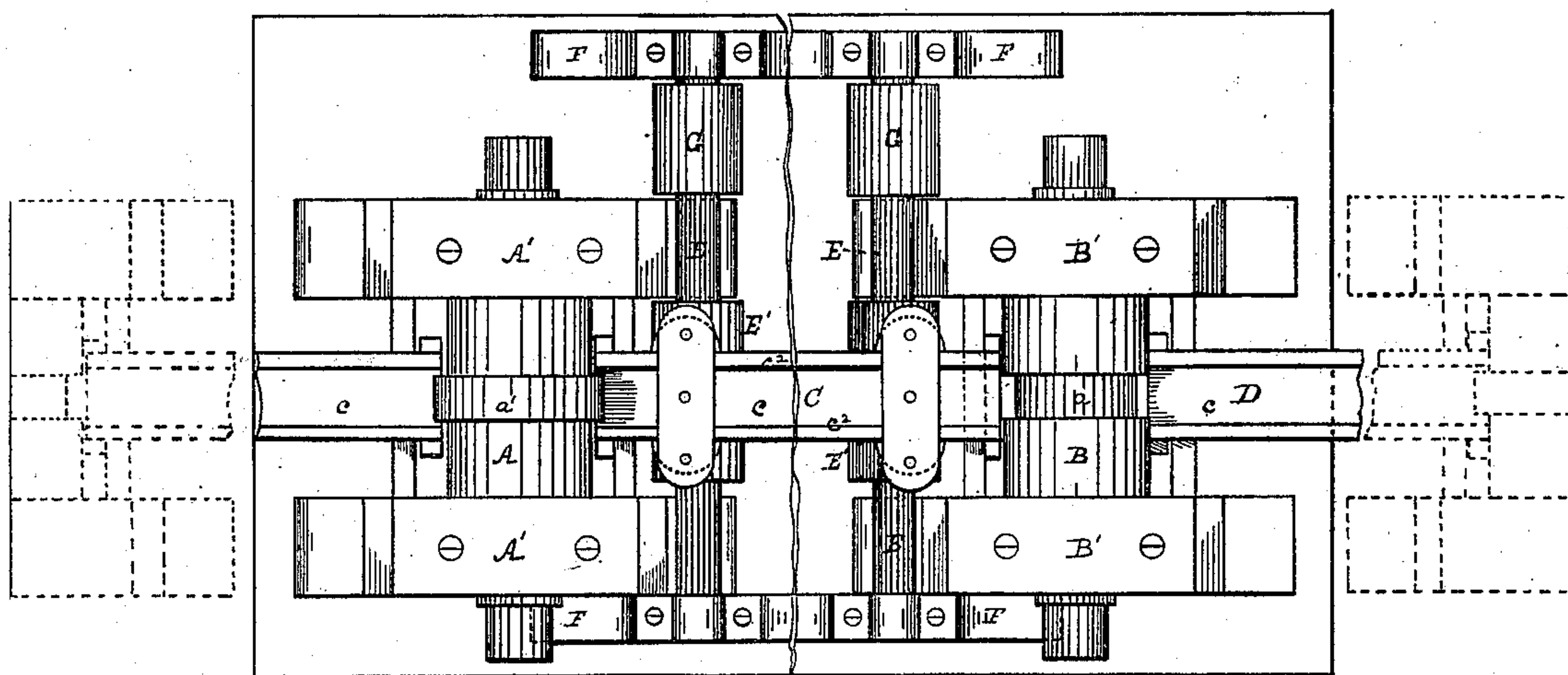


Fig. 1.

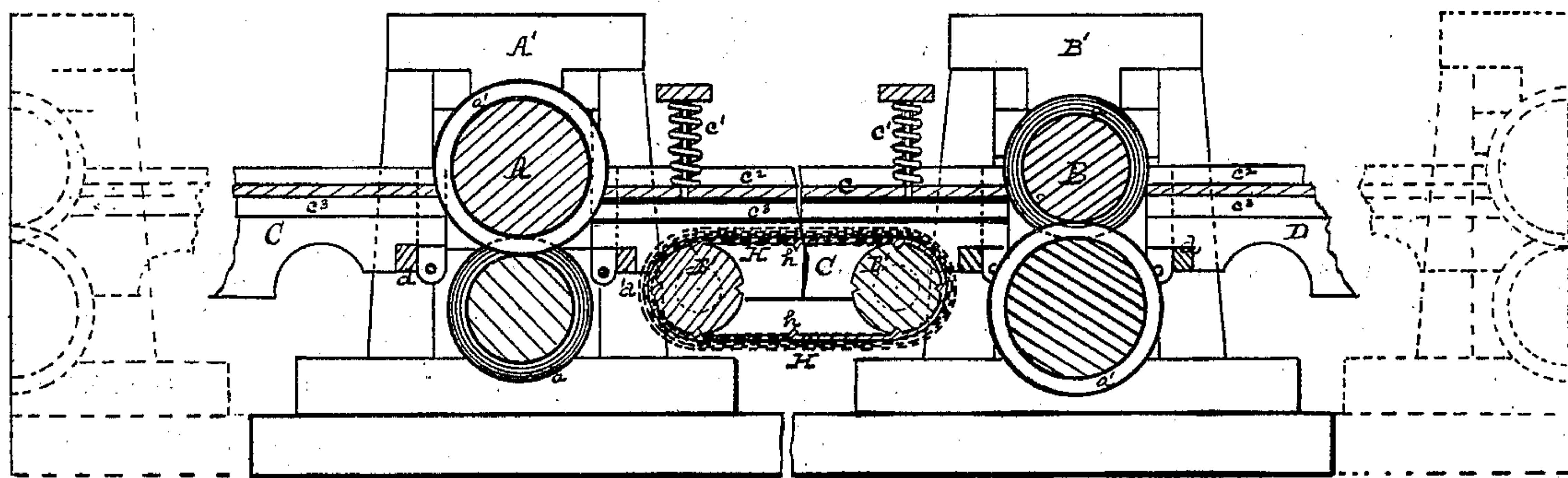


Fig. 2.

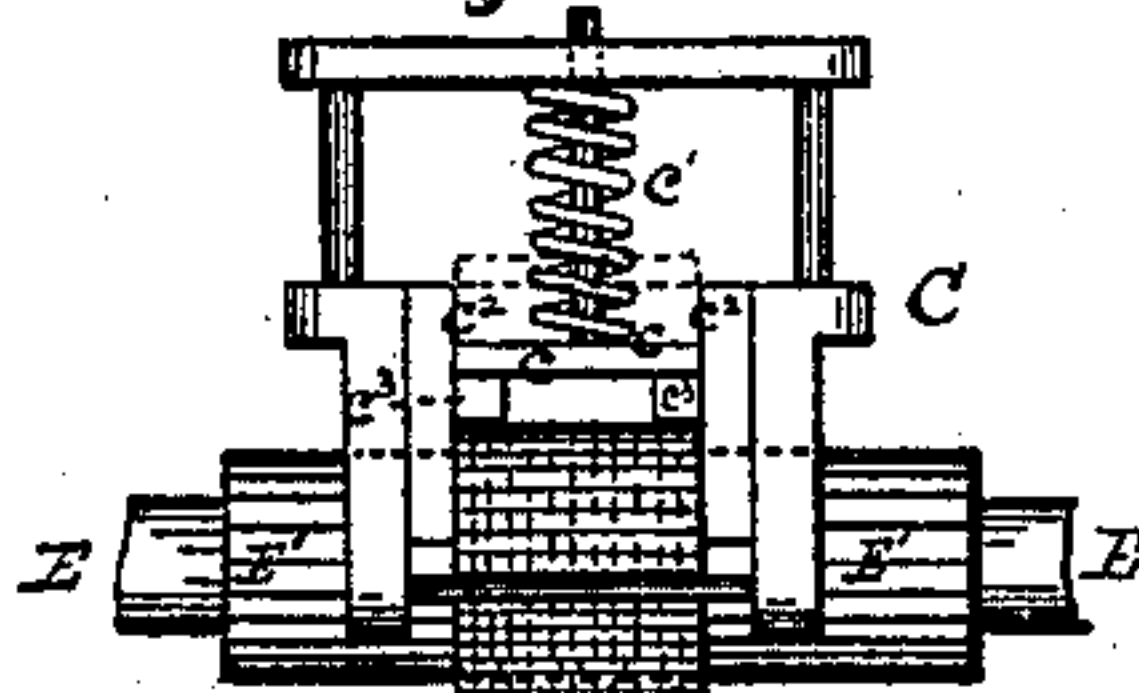


Fig. 3.

WITNESSES.

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SAMUEL C. FOX, OF PITTSBURG, ASSIGNOR TO HIMSELF AND JAMES H. LINDSAY, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN ROLLS AND CONDUCTORS FOR ROLLING METALS.

Specification forming part of Letters Patent No. 177,491, dated May 16, 1876; application filed September 20, 1875.

To all whom it may concern:

Be it known that I, SAMUEL C. FOX, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rolls and Conductors for Rolling Metals; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a plan view of a series of hoop-rolls and conductors embodying my invention. Fig. 2 is a longitudinal vertical section of two sets of rolls and the conductor between them, showing the apparatus for feeding the iron from one set to the other; and Fig. 3 is an end view of the conductor.

Like letters of reference indicate like parts in the several figures.

My invention relates to the construction and arrangement of the rolls and their conductors, &c., for rolling hoop and other iron.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A B represent two of a series of tongue-and-groove hoop-rolls, between each pair of which is a conductor, C D, so arranged as to receive the iron from one pair of rolls and to conduct it to the next. Each pair of rolls in the series is composed of one roll, grooved as shown at *a*, and another provided with a collar or tongue, *a'*, which works into the groove of the first-named roll. These rolls I arrange in series, the alternate pair of rolls having the tongue and groove reversed, as, for instance in the pair of rolls A, and in the pair forming the next in the series to the pair B. The tongue or collar *a'* is in the upper roll, while in the pair B the groove *a* is in the upper roll. By this arrangement of the rolls the turning of the iron at each pass is avoided and both time and labor saved, as this work has heretofore been done by hand.

C D are a series of conductors arranged between the rolls so as to receive the iron from one pair and conduct it to the next. These conductors C D rest upon the bearing-bars *d* upon the housings A' B'. Parallel to and near to each pair of rolls A B, I arrange the

shafts E journaled in the bearings F, and provided with the belt-pulleys E' and driving-pulleys G for imparting motion to the same. Upon the pulleys E' is placed the chain-belt or carrier H, for carrying the iron from one set of rolls to the next. At regular distances upon the belt H I place the cleats *h*, which catch in corresponding slots in the pulleys E', by which means power is imparted to the belt H. This belt or carrier H forms the bottom or lower part of the conductor, and fits against the inner sides or ledges *c*³, and together with them forms three sides of the box through which the iron passes. Power is applied to the shafts E and pulleys E' through the pulleys G in any suitable manner. These conductors are preferably closed by top plates C to prevent the iron from twisting out of the trough or conductor; but as the hoop may at times buckle, on account of the variation of the circumferential speed of the rolls it is necessary to make provision therefor. This I do by fitting the top plate *c* loosely in guides *c*² resting upon the ledges *c*³, or in any other suitable way, upon the upper part of the conductor, and holding it in position by means of springs *c*¹ bearing upon the plate *c*, or in a similar suitable manner. The advantage of springs is that while the plate *c* is capable of yielding, should the iron buckle, it will still be forced back by the springs *c*¹ in such a manner as to regulate the feed of the iron to the succeeding pair of rolls. If the pressure of the iron upon the plate *c* is great enough it will overcome the force of the springs *c*¹, press the plate out of the guides *c*², and thus escape from the conductor without damaging the conductor in any way. This plate *c* rests upon the ledges *c*³, before mentioned, which form the sides of the box through which the iron passes. By making these sides of different widths, conductors may be made to suit the different sizes of iron to be rolled.

The operation of my rolls and conductors is as follows: The iron is fed from the train-rolls to the first rolls of the series, as at A, from which it passes into the conductor C. The force of the rolls A drives the iron into the conductor until it rests upon the chain-carrier H, by which it is automatically carried for-

ward and fed into the rolls B, through which it passes onto the conductor D, and so on through the whole series of rolls. As the tongue and groove upon the second pair of rolls are the reverse of the first, the iron will not need to be reversed, so that one set of attendants is dispensed with, and from the second pair of rolls the hoop is passed by a second conductor to a third pair of rolls having the tongue and groove arranged like the first pair, and so on through any required number of rolls. Any tendency of the iron to buckle will be corrected and obviated by the self-adjusting top plate *c*, and if the force of the iron be too great the plate will be pressed out of the guides *c*², and the iron will escape from the box without damaging the conductor, as it might had no provision been made therefor.

The advantages of my invention are that to a great extent the operation is automatic, and the usual number of attendants required is greatly reduced.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of two or more pairs of

hoop-rolls, the tongues and grooves of the alternate pairs being reversed, and intermediate conductors having relief tops, substantially as and for the purpose specified.

2. The combination of two or more pairs of hoop-rolls, the tongues and grooves of the alternate pairs being reversed, and intermediate conductors provided with chain-belt or traveling bottoms, substantially as and for the purpose specified.

3. In combination with two pairs of work-rolls, the interposed conductor having a traveling bottom, substantially as and for the purpose specified.

4. A conductor for feeding metal to or between rolls provided with a relief top, and having its bottom formed by a chain-belt or carrier, substantially as described.

In testimony whereof I, the said SAMUEL C. Fox, have hereunto set my hand.

SAMUEL C. FOX.

Witnesses:

T. B. KERR,
JAMES I. KAY.