(No Model.) 2 Sheets—Sheet 1.

A. J. DEMMLER.

MACHINE FOR ROLLING SHEET METAL.

No. 256,652. Patented Apr. 18, 1882.

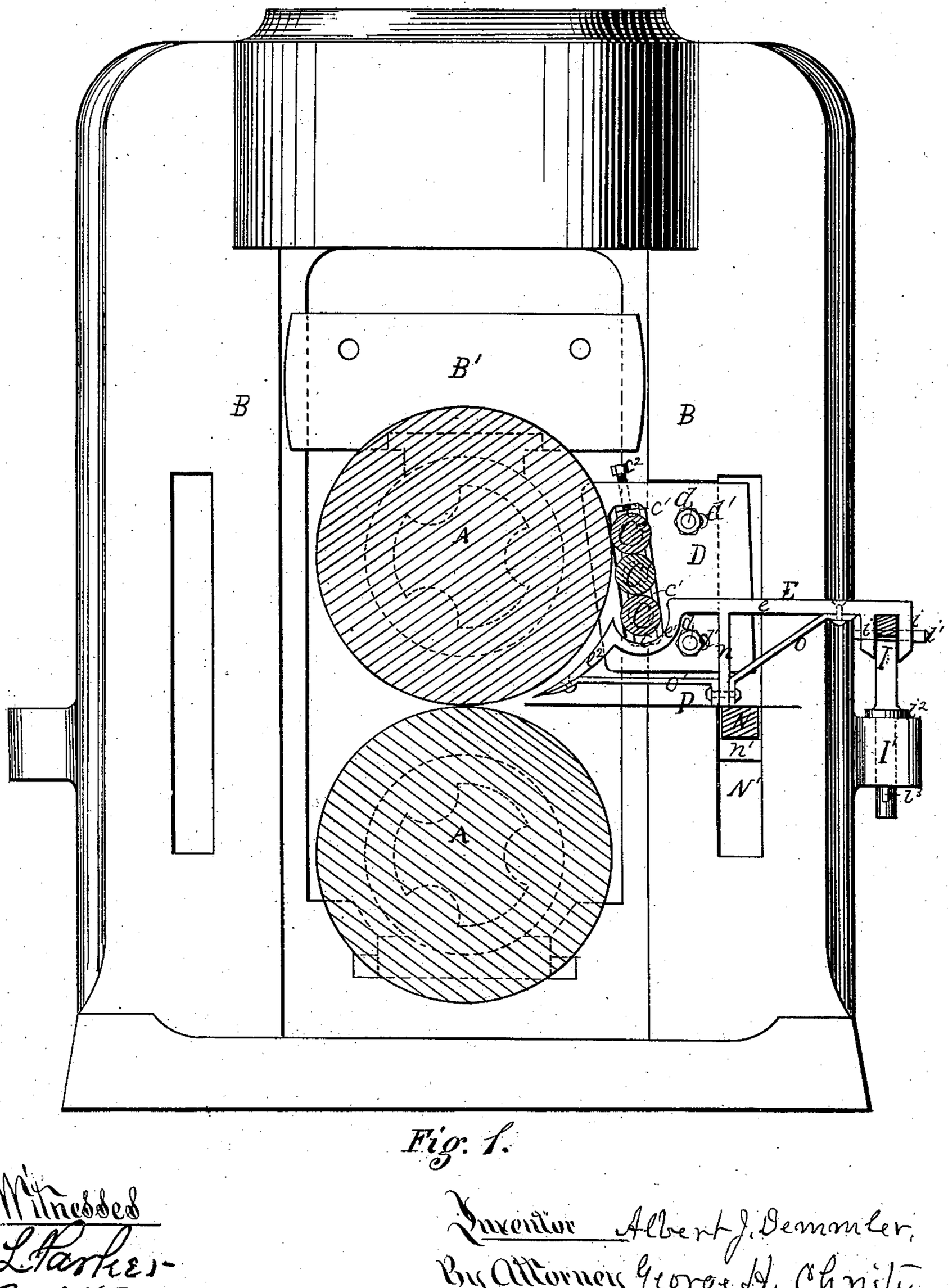

Fig. 1.

Witnesses
C. L. Parker
R. F. Whittlesey

Inventor Albert J. Demmler.
By Attorneys George H. Christy

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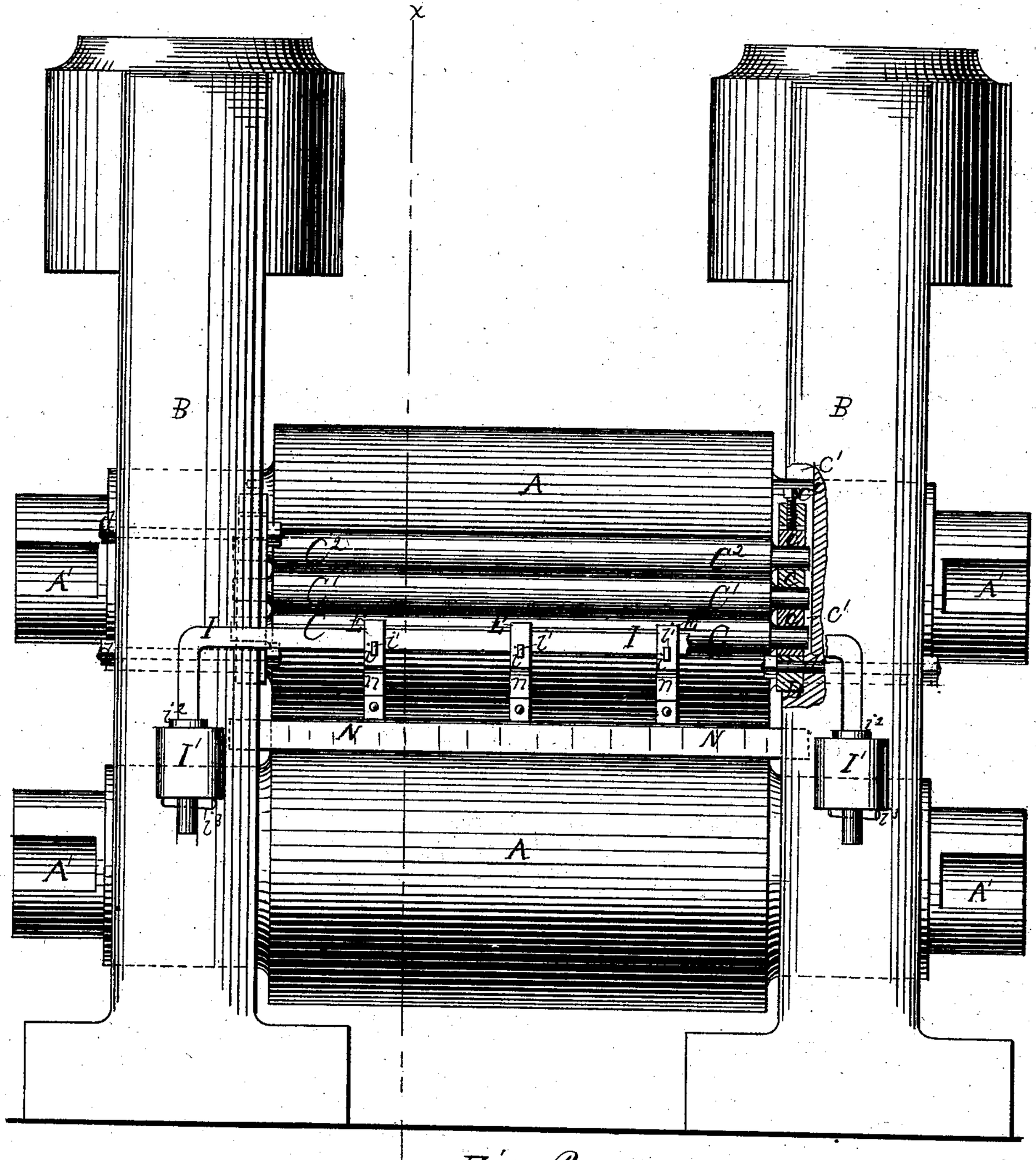

Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT J. DEMMLER, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR ROLLING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 256,652, dated April 18, 1882.

Application filed February 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALBERT J. DEMMLER, a citizen of the United States, residing at Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Machines for Cold-Rolling Thin Metal Plates; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1, Sheet 1, is a transverse sectional view of my improved machine, the section being taken in the plane of the line *x x*, Fig. 2; and Fig. 2, Sheet 2, shows a front elevation of the machine.

In cold-rolling thin plates or sheets of iron for tinning and other uses considerable difficulty has been experienced, arising from a tendency in the thin plates to curl, warp, or draw transversely on the feed side of the rolls. This difficulty is especially troublesome when considerable pressure is applied through the rolls, and in order to avoid it as far as possible it has been customary to cold-roll the plates by a greater number of passes with comparatively light pressure, resulting in slow reduction with a corresponding increase in expense.

My invention is designed to obviate this difficulty by feeding the plates to the reducing-rolls by means of feed-rolls above or below the plane of passage between the reducing-rolls, whereby the plates are bent in the direction of feed, and thus stiffened as against transverse curling, warping, or bending under pressure from the reducing-rolls, as hereinafter described and claimed.

In the drawings, A A represent two cylindrical plain-faced rolls—such, for example, as are commonly employed for cold-rolling iron plates for tinning. These rolls are mounted in two housings, B B, by the usual or any suitable adjustable bearings, B′, adapted to set the rolls for plates of different thickness.

The usual roll-necks, A′, are provided for coupling the rolls to any suitable driving mechanism—such, for example, as is usually employed for like purposes.

On the feeding side of the rolls, above their plane of bite or passage, are mounted two feeding-rolls, C C′, in adjustable bearings *c*, which are secured in the usual way in slotted openings *c′*, made in each of two bearing plates or blocks, D D, which latter are secured by bolts *d* and slotted bolt-holes *d′* to the inner or adjacent side faces of the main housings. In order to give motion to these feed-rolls I employ a third roll, C^2, of the same size as rolls C C′, and mounted in slots *c′* above them in substantially the same manner. By means of adjusting-screws c^2 this upper roll, C^2, is pressed upon the intermediate or upper feed-roll, C′, sufficiently to communicate the desired power by friction. Also, the bearing-blocks D are adjusted by means of the slot-and-bolt connections *d d′*, so as to cause the roll C^2 to bear against the upper reducing-roll A, by preference, in or near the horizontal plane through its axis. The motion of the reducing-roll will thus be communicated through frictional contact to the upper feed-roll, C′, and from it, through the interposed plate, to the lower feed-roll, C.

In order to preserve as large size as practicable in the two feed-rolls, and also cause them to stand away from the reducing-roll sufficiently to prevent the roll C′ from touching it, and also permit of passing the plate downward between rolls C and A without making too short a bend, I incline the plane of the three rolls C C′ C^2, as in Fig. 1, thus bringing these rolls C C′ away from A. The same results may be secured, however, by mounting the roll C^2 out of line with the other two; but for simplicity of construction and facility of making adjustments I prefer the construction shown.

Instead of driving the feed-rolls by a friction-roll, as described, they may be geared with either of the reducing-rolls to run at the required speed to feed at the proper rate, and in such case the feed-rolls may be removed a little farther from the reducing-rolls; but I prefer to drive the feed-rolls by friction, as described, whereby the proper rate of feed is secured with greater certainty, and is brought more directly under the control of the reducing-rolls.

In order to direct the plates to be rolled both to the feed-rolls C C′, and from them to the reducing-rolls A A, I make use of bars E

in any desired number, three being shown. (See Fig. 2.) These bars consist of horizontal portions *e*, the upper surfaces of which are in the plane of feed between rolls C C′, curved portions *e′* dipping under roll C, and inclined portions e^2 extending downward from rolls C C′ toward the passage between rolls A A.

The parts *e* of the bars form a horizontal feed-table for presenting plates to the feed-rolls, and the inclined parts e^2 are designed to hold the plates against the surface of upper roll, A, as they are delivered from the feed-rolls, and to present them properly for passage through the reducing-rolls. These bars may be supported in the described position in any convenient way. I have shown them at their outer ends connected by lips or lugs *i* and keys *i′* to a cross-bar, I, which latter is secured in front of the housings by downwardly-bent ends, which pass through sockets I′, and are secured therein by shoulders i^2 above and keys i^3 below. These sockets I′ are rigidly secured to the housings in any convenient way, and afford a stable support for the rod, and at the same time permit of its removal when desired. Also, from a point in the bars E near the feed-rolls vertical supports or posts *n* extend downward and rest upon the fore-plate P, or upon a transverse bar, N, which latter is supported at its ends by blocks or keys *n′* placed in vertical openings N′ made in the adjacent side faces of the housings B. By changing the blocking *n′* the inner ends of bars E may be raised or lowered in order to bring them in proper relationship to both the feeding and reducing rolls. The vertical supports *n* are strengthened by braces *o*. Also, a bar or brace, *o′*, is extended from *n* to the inclined fingers e^2 in order to give them increased stability.

When it is desired to use the reducing-rolls A on heavy plates not subject to difficulties experienced with thin plates the guide-bars E may be removed readily and the fore-plate P be employed in the usual way; but in the application of my invention with the means described this fore-plate may be omitted.

In operation sheets or plates of iron to be cold-rolled are placed on the horizontal table *e e* and presented singly to the feed-rolls C C′, by which each plate in succession is carried forward against the periphery of the upper reducing-roll. They are thus deflected downward, and, being held against or near the surface of roll A by the inclined fingers e^2, they are presented to the reducing-rolls in proper position to be passed between the same. The inclined fingers e^2 also serve to keep the following edge of the plate bent upward against roll A after it leaves the feed-rolls. The bend thus given to the plate in the direction of feed stiffens it against tendency to bend, curl, warp, or draw transversely to the line of feed. Consequently the plates may be subjected to heavy pressure and cold-rolled rapidly without danger of loss or injury, which has heretofore attended such cold-rolling.

It is obvious that the feed-rolls C C′ may be placed below the plane of passage between the reducing-rolls, and the plates be bent upward for such passage instead of downward, thereby securing substantially the same results, the object being to pass the plates to the reducing-rolls from a different plane from that of their passage through such rolls, thereby bending the plates in the direction of the line of feed, and stiffening them as against warping, curling, or bending transversely to such line.

Instead of making the parts *e* e^2 of the bars E integral, they may be separate, and separately supported in any suitable way. Also, instead of separate bars E, continuous plates may be used both for horizontal table *e* and guide e^2. Other like modifications may be made in the details of construction without departing from my invention.

I claim herein as my invention—

1. In a machine for cold-rolling thin iron plates, the combination of two reducing-rolls and two feed-rolls parallel with the reducing-rolls, with the passages between such two sets of rolls in different planes, substantially as and for the purposes set forth.

2. The combination of two reducing-rolls, A, two feed-rolls, C C′, and friction-roll C^2, having bearing upon one of the reducing-rolls, and also on one of the feed-rolls, substantially as set forth.

3. The combination of two reducing-rolls, two feed-rolls parallel with the reducing-rolls, but with passage through such two sets of rolls in different planes, and a guide for directing the plates from the feed to the reducing rolls, substantially as set forth.

4. The combination of reducing-rolls A, feed-rolls C C′ parallel with but above the plane of passage through the reducing-rolls, inclined guide e^2, and horizontal table *e*, substantially as set forth.

5. The combination of housings B, reducing-rolls A, feed-rolls C C′, friction driving-roll C^2, and adjustable bearing-plates D, secured to the inner side faces of the housings, substantially as described.

In testimony whereof I have hereunto set my hand.

ALBERT J. DEMMLER.

Witnesses:
C. L. PARKER,
R. H. WHITTLESEY.