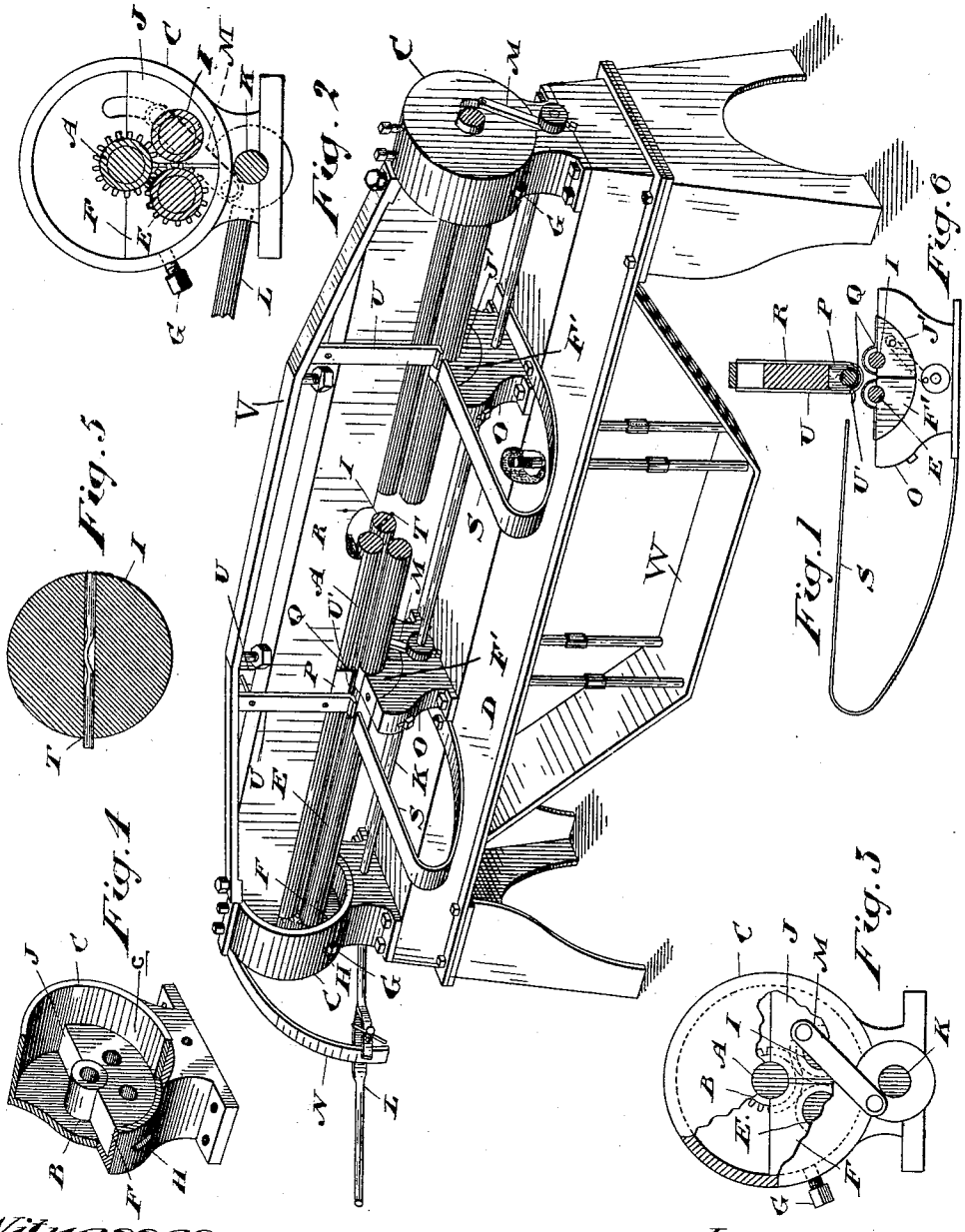
(No Model.)

W. S. SHIPE.

SHEET METAL ROLLING MACHINE.

No. 480,440. Patented Aug. 9, 1892.



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UNITED STATES PATENT OFFICE.

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SHEET-METAL-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,440, dated August 9, 1892.

Application filed February 27, 1891. Renewed May 14, 1892. Serial No. 432,975. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT SHIPE, of the city of Toronto, in the county of York, in the Province of Ontario, Canada, have invented a certain new and useful Improvement in Sheet-Metal-Rolling Machines, of which the following is a specification.

The object of the invention is to design a light and easy bending-machine capable of bending the sheet metal into the shape of a cylinder which can be removed from the machine without disturbing any of its parts; and it consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described, and then definitely claimed.

Figure 1 is a perspective view of my improved machine. Fig. 2 is an inside view of the bracket in which the roll-bearing boxes are supported. Fig. 3 is an outside view (partially broken away) of the said bracket. Fig. 4 is a perspective view, partially in section, of the said bracket and bearing-boxes. Fig. 5 is a sectional end view of the roll in which the adjustable feeding-pin is carried. Fig. 6 is a vertical central cross-section of the upper part of the machine above the bed.

A is the main roll. This roll should have a connection at each end with the driving-motor; but as I do not claim anything peculiar in the connection between my machine and the driving-motor I have not exhibited it in the drawings. This roll A is supported at each end in a suitable bearing-box B, which is fixed to or forms part of the end of the hollow bracket C, bolted or otherwise connected to each end of the bed D. The roll E is journaled at each end in a bearing-box F, supported, as indicated, in the end bracket C. This bearing-box, it will be noticed, is a quadrant of a circle and fits inside of the recess *c* of the bracket C and against the bearing-box B, as indicated in Fig. 4, so that the roll E, which is supported at each end by a bearing-box like F, may be easily adjusted to alter its relative position with the roll A without interfering with the gearing between the two rolls.

With the view of holding the roll E in the position that it may be desired to set it a set-screw G is screwed into a hole made in the box F and passes through a slot H, made in the bracket C, as shown. The third roll I is supported at each end in a bearing-box J similar to and supported in the same way as the bearing-box F.

K is a rod supported in suitable bearings, as shown in Fig. 1, and having a lever L, fixed to one of its ends. Links M are provided, as shown in Figs. 1, 2, and 3, to form such a connection between the rod K and the bearing-boxes J that the revolving of the rod K will cause the roll I, supported by the said bearing-boxes, to alter its relative position to the main roll A; and in order to easily lock the said roll I in the position in which it may at the time be set I form a clamp or other locking device upon the lever L and arrange it in connection with the quadrant N, extending from any suitable portion of the frame of the machine. This quadrant I mark as shown in Fig. 1, so that the operator can readily see what distance he has moved the roll I and in what position the said roll may at the time be set.

It will be observed on reference to Fig. 1 that I locate between the end brackets C and securely fixed to the bed D two brackets O, which are provided for the purpose of supporting two sets of bearing-boxes F′ and J′ similar to F and J, all the bearing-boxes F and F′ being supported and held in position in the same manner as the bearing-boxes F, while all the bearing-boxes J and J′ are connected to the rod K by means of links M, as already described. These intermediate bearings enable me to use very small rolls, and in practice I have found that I can make two-inch rolls do as much work as six-inch rolls not having intermediate supports.

Of course I do not confine myself to the number of intermediate supports. Intermediate bearings P are also provided for the roll A, the said bearings being opposite to the intermediate bearings provided for the rolls E and I. At each of the intermediate bearings the rolls are recessed, so that a cap or plate Q may be placed over each bearing without interfering with the passage of the plate being rolled. These caps or plates protect the bearings and prevent the scale from injuring

them. A beam R, narrow enough to allow the rolled cylinder to be withdrawn, extends from one bracket C to the other and is securely connected thereto. The bearings P butt against the beam R, which thereby prevents the roll A springing. This beam is braced by a queen-truss V. I also brace the bed D by a queen-truss W, as shown in Fig. 1. The roll E is geared to the main roll A at one end and the roll I to the roll A at the opposite end in order that the rolls E and I may be brought closer together, as indicated in Fig. 2.

Having now described my machine, I shall proceed to explain briefly its operation. The sheet of metal to be rolled is placed on the supporting-springs S. These springs are set so as to keep the sheet of metal above the foot U′, formed on the stop-plates U. The rolls E and I having been previously set in the required position, the spring-supports are pressed down, so that the plates shall pass below the stop-plates U, and the sheet is then pushed over the roll E until it comes in contact with the roll I, all the rolls being geared together so that they will act as feed-rolls. A series of pins T is placed in the roll I alternately at right angles to each other and are so placed in their respective holes that they are longitudinally adjustable therein without being so loose that they will fall out. In Fig. 5 I suggest a plan which will accomplish the desired purpose—that is to say, I form a spring in the center of each pin, which spring is set so as to act against the side of the pin-hole. When the sheet comes in contact with the roll I, the pins T act against the bottom of the said sheet and lift it onto the said roll. When this is accomplished, the pins are simply pushed in every time that they come in contact with the said sheet. Each time that the sheet is passed through the machine it returns onto the spring-supports S, which support it so as to direct its edge against the stop-plates U, and thus prevent the sheet re-entering the rolls until the operator is ready. The lever L is then moved so as to raise the roll I a little higher, the sheet adjusted so as to bring its edge clear of the foot U′, the spring-supports pressed down, and the sheet adjusted so as to re-enter the rolls. This is repeated until the cylinder is sufficiently complete to permit its edges to be pressed together, when the cylinder may be raised up out of the machine without it being necessary to remove any part of the machine.

What I claim as my invention is—

1. A sheet-metal-rolling machine having three rolls geared together, one roll having fixed bearings in a bracket C, having a recess *c*, and a second one set in a quadrant arranged to slide in said recess *c* and constructed to be adjusted away from or nearer to the third roll in a curve concentric with the roller having the fixed bearings, substantially as described.

2. A sheet-metal-rolling machine having three rolls geared together, the main driving-roller having a fixed bearing, another of the said rollers having movable bearings at each end and intermediate thereof, a rod running parallel with said rollers and connected to said movable bearings, and means for moving the same, substantially as described.

3. A sheet-metal-rolling machine having three rolls geared together, the main driving-roller having a fixed bearing, another of the rollers having movable bearings at each end and intermediate thereof, a rod running parallel with said rollers, connected to said movable bearings, a lever attached to said rod for moving the same, and a locking device for securing said rod in position, substantially as described.

4. In a sheet-metal-rolling machine, a feed-roll having a series of lifting-pins sliding through it, substantially as described.

5. In a sheet-metal-rolling machine, the main roll A, journaled in the stationary bearing-boxes B, which are supported in the end brackets C, the roll E, geared to the roll A and supported in the adjustable bearing-boxes F, the roll I, journaled in the bearing-boxes J and geared to the roll A, in combination with the links M, connected to boxes J, rod K, connected to the links M, and lever L, attached to rod K and provided with suitable locking mechanism, substantially as and for the purpose specified.

6. In a sheet-metal-rolling machine, the combination, with the rolls thereof, of the springs S, arranged to support the sheets about to be rolled, and a stop-plate U, having its acting or foot end slightly below the normal surface of the supporting-springs, substantially as and for the purpose specified.

Toronto, April 16, 1891.

WALTER S. SHIPE.

In presence of—

CHARLES C. BALDWIN,
JOHN E. CAMERON.