(No Model.)

C. A. BERTSCH.

METAL BENDING MACHINE.

No. 510,764. Patented Dec. 12, 1893.

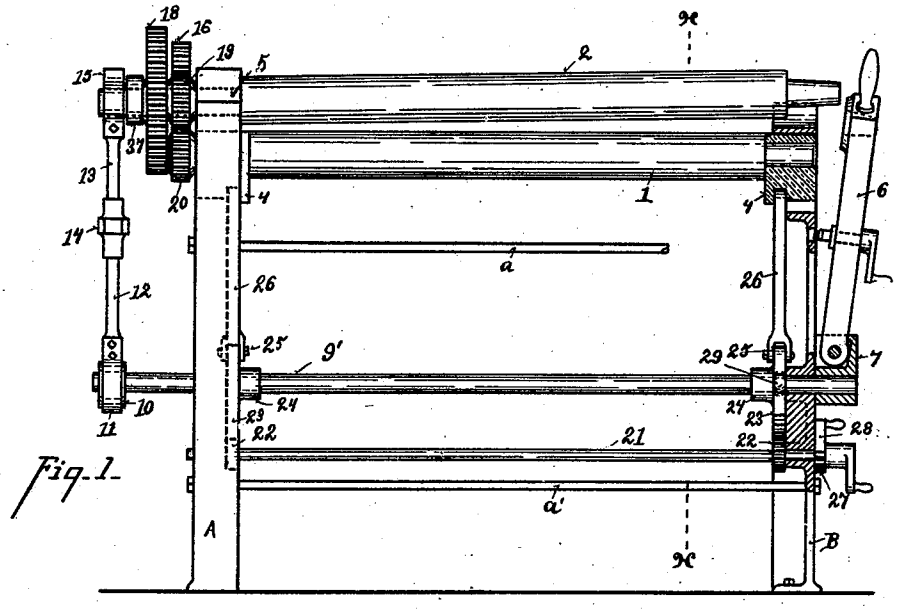

Fig. 1.

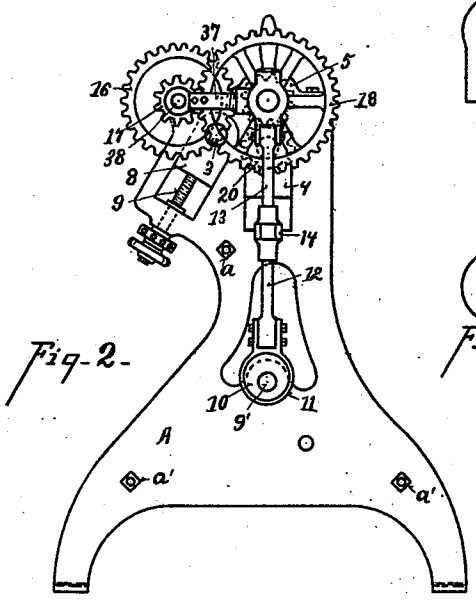

Fig. 2.

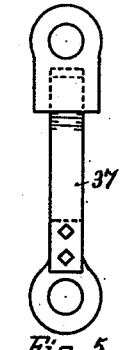

Fig. 5.

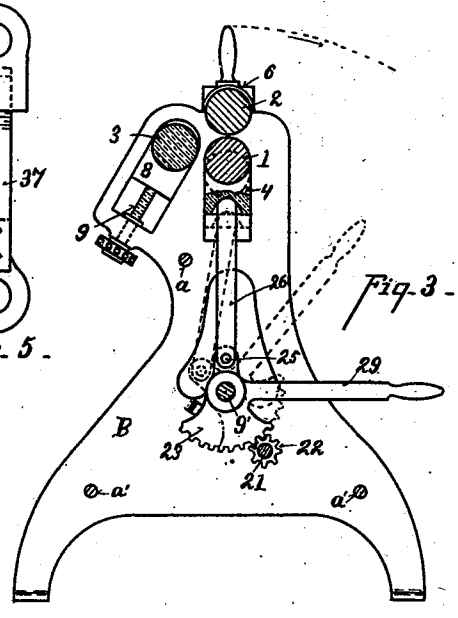

Fig. 3.

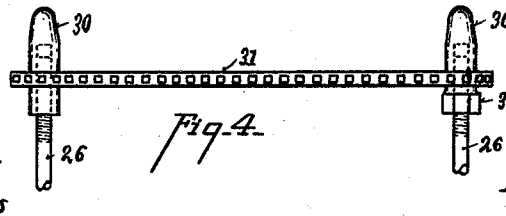

Fig. 4.

Witnesses
C. W. Miles.
T. Simmons

Inventor
Charles A. Bertsch.
By Thos. L. Boyd
Attorney

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. BERTSCH, OF CAMBRIDGE CITY, INDIANA.

METAL-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,764, dated December 12, 1893.

Application filed May 22, 1893. Serial No. 475,066. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BERTSCH, a citizen of the United States, residing at Cambridge City, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Metal-Bending Machines, of which the following is a specification.

My invention relates to improvements in machines for rolling sheet metal and metal plates, employing either smooth or corrugated rolls.

It also relates to certain novel features in the construction of said machines which will be hereinafter explained.

The object of my invention is to provide novel, simple and efficient mechanism by which the rolls are adjusted for various purposes required in the operation.

In the accompanying drawings making a part of this specification—Figure 1 represents a side elevation of my improvement in position for taking out and inserting the metal. Fig. 2 is an end elevation of the machine. Fig. 3 is a section on line *x*, *x*, Fig. 1. Fig. 4 is a modification of the roll adjusting mechanism. Fig. 5 is a detail view of the coupling yoke.

A represents one of the end frames, and B the opposite end frame. These are connected together by suitable cross rails *a a'*.

1 represents the lower roll mounted in sliding journals 4, 4, which rest in the frame of the machine.

2 represents the upper roll, one end of which is mounted in bearing 5, which is provided with sufficient lost motion to allow it to rock; the opposite end of roll 2 is mounted in the pivot lever 6 which is pivoted at the lower end to the crank frame 7.

3 represents the rear roll which is mounted in inclined adjustable bearings 8.

9 represents screw rods for raising and lowering the journal box for adjusting the rear roll to and from the upper and lower rolls. The rolls are subjected to great strain in bending the metal and must be rigidly held in place during the operation of bending or corrugating. When the operation has been completed the metal is still pinched between the rolls, and when it is of curved form it is difficult to move, and for this purpose I provide the following instrumentalities:

9' represents a shaft which projects through the frame at each end.

7 represents a crank arm at one end rigidly attached to the shaft by means of which it is turned.

10 represents an eccentric keyed to the shaft at the opposite end.

11 represents an eccentric ring; 12, 13, sections of the connecting rod united by the turn buckle 14.

15 represents a yoke engaging with the outer end of the shaft journal of the upper roll 2.

16, 17, 18, 19, 20, represent driving gears.

The rear roll 3 runs as an idler.

When it is desired to spread the feed rolls apart in the position shown in Fig. 1, the lever 6 is moved off out of engagement with the gudgeon of the top roll, and then turned toward the operator oscillating the shaft 9', which moves the eccentric 10 in the direction to pull downward, thereby freeing the outer end of roll 2 and lifting it away from roll 1 so that the formed metal can be readily slipped off. The turn-buckle 14 adjusts the length of the connecting rod by moving the sections 12, 13, together or apart, so that any desired elevation of the roll 2 may be obtained.

The roll 1 may be adjusted at one end, or at both ends as desired. When it is adjusted at one end I provide the following instrumentalities: 21 represents a crank shaft upon which is keyed a pinion 22 meshing with the segment 23. The hub 24 of segment 23 is loosely journaled on shaft 9'. 25 represents a crank arm opposite the segment 23 to which is pivoted standard 26. Upon the upper end of this standard the journal box 4 is mounted. By turning shaft 21 the standard 26 and the superimposed roll journal box are raised and lowered and adjust the lower roll 1.

In order to hold the roll in any adjusted position I provide a ratchet wheel 27 or other locking device on the outer end of the shaft 21.

28 represents a pawl engaging with the teeth of ratchet 27 for holding the shaft 21 in any desired adjustment when in use.

In Fig. 3 I have shown a modified means

for moving the standard 26 which consists of the lever 29 rigidly secured to the hub 24 of the segment by means of which the operator can readily raise and lower the journal bearings 4 of the lower roll 1.

A locking mechanism might be employed to lock the lever 29 in place and the locking device 27 dispensed with in small machines.

It is generally desired to adjust the boxing 4 at both ends. When this is done I provide standards 26 at each end of the frame. The standards are screw threaded and provided with sleeves 30 which engage in holes pierced in the bearings 4.

31 represents a sprocket chain engaging with sprockets on the sleeves. 32 represents a nut on one of said sleeves. A wrench applied to said nut will turn one of said sleeves, and the sprocket chain will transmit the same motion to the opposite end so that both the boxes 4 may be raised and lowered simultaneously, and thus adjust the height of roll 1 to and from the upper roll 2, according to the thickness and character of the metal to be wrought.

In order to prevent the free end of the roll 2 from canting forward out of line when it is turned up in position I provide a yoke 37 one end of which engages upon the shaft 38 of gear 17. The opposite end is provided with the journal engaging the shaft of the upper roll between the gears 18 and bearing 15. Said yoke is made of two sections. One section is screw-threaded into the hub of the opposite section so that its length can be adjusted to the exact distance, thereby serving as a section bearing to hold the roll 2 firmly in the fixed horizontal plane, and yet allow it to move in a vertical plane.

By means of the instrumentalities herein shown the rolls can be readily spread apart for removing bent or corrugated metal strips or rings, and yet held rigidly in position for the operation of bending or corrugating. The lower roll may also be lowered and it may be adjusted to and from the upper roll for any required thickness of metal.

Having described my invention, what I claim is—

1. In a metal bending machine, the combination with the upper roll 2, of a shaft 9′ having the crank arm 7 at one end portion, and an eccentric 10 at the opposite end portion, a connecting rod between the eccentric and one end of the upper roll for tilting the latter in a vertical plane, and a swinging lever 6 carrying the journal bearing for the opposite end of said upper roll and secured to the crank arm of the eccentric carrying shaft for turning the latter when said lever is swung outward from engagement with the upper roll, substantially as described.

2. In a metal bending machine, the combination with the roll 2 loosely journaled in bearing 5, the journal lever 6 pivotally connected to and adapted to rotate shaft 9′, eccentric 10, sectional connecting rod 12, 13, turn-buckle 14, provided with bearings engaging respectively with the outer end of roll 2, and shaft 9′, substantially as specified.

3. In a metal bending machine, the combination with the upper roll 2, a loose bearing 5 therefor, and mechanism for swinging one end of said upper roll vertically, of a swinging supporting yoke 37 pivoted at one end, and at its opposite end loosely engaging the said upper roll for holding the latter while it swings vertically, substantially as described.

4. In a metal bending machine, in combination with the lower roll 1, sliding journal box 4 supported upon the standard 26, pivoted to the crank arm 25, and the segment and pinion mechanism for oscillating the crank arm and vertically adjusting said journal box 4, substantially as specified.

5. In a metal bending machine, in combination with the roll 1 supported upon slide journal boxes 4, the standards 26, the sleeves 30, screw threaded to said standards, and the sprocket chain 31 engaging with sprocket wheels on the said sleeves 30, whereby both ends of roll 1 are simultaneously adjusted vertically, substantially as specified.

6. In a metal bending machine, the combination with the lower roll 1, sliding journal boxes 4, and standards 26, of rotatable crank arms 25, a shaft 21 having a hand lever by which it can be turned at will, gearing between the crank arms and said shaft, and means for locking the shaft in its adjusted position, substantially as described.

In testimony whereof I have hereunto set my hand.

CHARLES A. BERTSCH.

Witnesses:
T. SIMMONS,
C. W. MILES.