(No Model.) 2 Sheets—Sheet 1.

E. T. HORNER.

METAL ROLLING MACHINE.

No. 484,368. Patented Oct. 11, 1892.

Fig. 1.

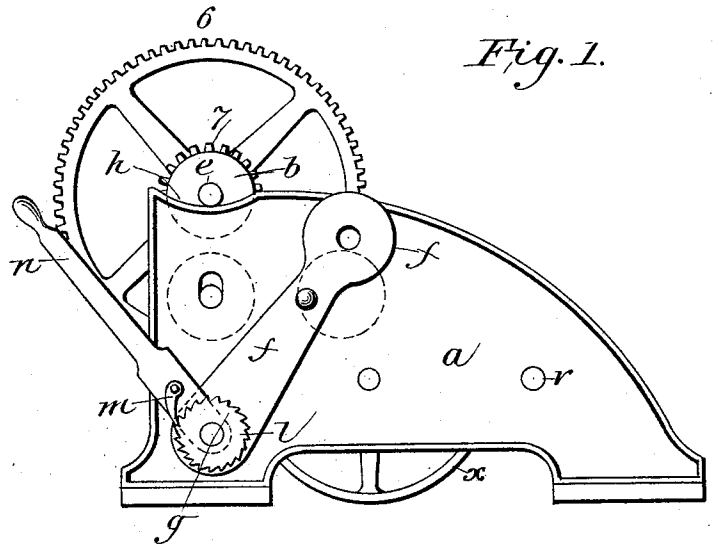
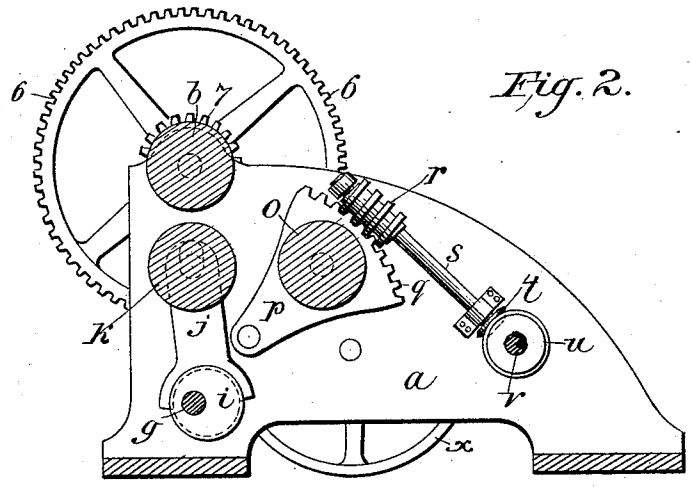


Fig. 2.



Witnesses:
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Jas. B. Lackey.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

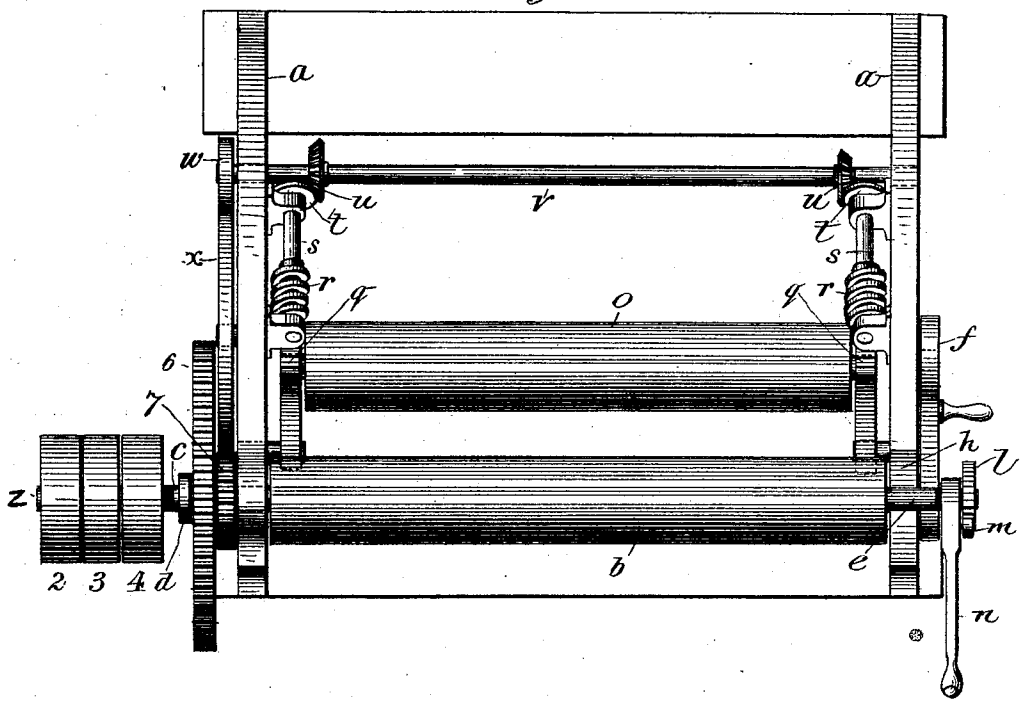
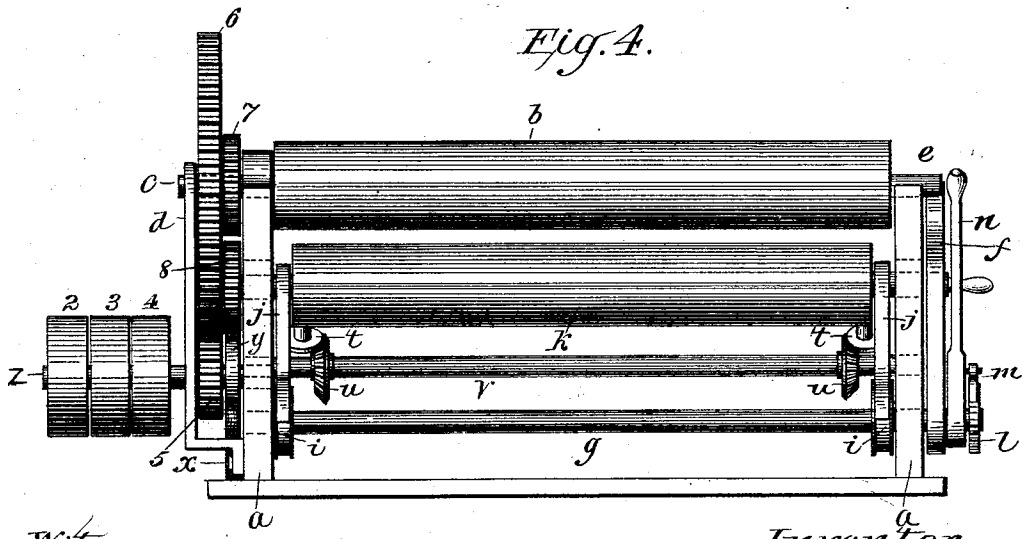


Fig. 4.



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Inventor:
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By Taylor & Hayes Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ELWOOD T. HORNER, OF CAMBRIDGE CITY, INDIANA, ASSIGNOR OF ONE-HALF TO JOHN A. SPENCE, OF SAME PLACE.

METAL-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 484,368, dated October 11, 1892.

Application filed February 17, 1892. Serial No. 421,881. (No model.)

To all whom it may concern:

Be it known that I, ELWOOD T. HORNER, 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-Rolling Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in machinery for rolling sheet metal and metal plates; and it consists in certain novel features, which will be hereinafter described and explained.

The object of my invention is to provide simple and efficient mechanism by which the rollers may be easily adjusted to permit the insertion and removal of the metal sheets or plates and will be held in their proper positions when in use to accomplish the desired effect on the metal. This object I accomplish by the use of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of my improved machine. Fig. 2 is a vertical section of the same. Fig. 3 is a plan view thereof, and Fig. 4 is a front elevation.

In carrying out my invention I employ a suitable base-plate or supporting-bars, upon which I erect the standards *a a*, which are preferably of a triangular shape. The upper roller *b* is provided at one end with an extended journal *c*, which is mounted in the adjacent standard *a* and the bracket or supporting-bar *d*, secured to the side of the said standard. The opposite end of the roller *b* has its journal mounted in a bearing *e* at the upper end of a lever *f*, which is pivotally mounted on a shaft *g*, which is journaled in the lower front portions of the standards and extends between the same. The upper corner of the standard, adjacent to the lever *f*, is so constructed as to present the concave recess *n*, in which the bearing *e* rests, when it is shifted into position to support the roller. When the said bearing *e* is thrown backward, the sheet or plate of metal which has been rolled may be removed from between the rollers by sliding it laterally over the standard, as will be readily understood.

The shaft *g* above referred to is provided near the inner sides of the standards with the eccentrics *i*, upon which rest the lower ends of the vertical arms *j*, in the upper ends of which I journal the lower front roller *k*. Near the outer end of the shaft *g* I provide a ratchet-wheel *l*, which is engaged by a pawl *m*, said pawl being carried by a lever *n*, which is loosely fulcrumed on the shaft *g*. By this mechanism the said shaft can be readily rotated, and when so rotated it will cause the eccentrics *i* to raise or lower the arms *j*, and thereby adjust the roller *k* to or away from the roller *b*, so as to permit the ready insertion of the sheet or plate or maintain the proper pressure thereagainst.

The rear roller *o* is journaled in the upper ends of triangular plates *p*, which are pivoted at their lower ends to the inner sides of the standards *a* and have their upper edges formed into segmental gears *q*, as clearly shown. These segmental gears are engaged by the worms *r* on the shafts *s*, which are mounted in suitable bearings on the inner sides of the standards and are provided at their lower rear ends with the bevel-pinions *t*, as shown. The said pinions *t* mesh with the pinions *u* on a shaft *v*, which is journaled in the standards and has one end extended laterally beyond the standards and provided with a disk *w*, which is in frictional contact with a pulley *x*, mounted on a stub-shaft on the side of the standard and receiving motion from a friction-pinion *y*, which is secured to the driving-shaft *z*. The said driving-shaft *z* is journaled in the standard and the bracket *d* and is provided at its outer end with the pulleys 2 3 4, whereby motion may be imparted to the said shaft from any suitable motor. On the said shaft I secure a pinion 5, which meshes with the gear-wheel 6, secured on the extended journal *c* of the roller *b*, as shown. A pinion 7 is also secured on the extended journal *c* and meshes with a pinion 8 on the journal of the roller *k*, the journal of the said roller *k* playing in a vertical slot in the standard to permit the necessary adjustment of the said roller. The

segmental gears *q* and the worms *r*, engaging the same, cause the roller *o* to be adjusted to and away from the front rollers, so as to give the proper transverse curvature to the metal plates or sheets.

In practice the edge of the sheet to be operated upon is inserted between the rollers *b* and *k*, and the lever *n* is then vibrated, so as to cause the eccentrics *i* to force the said roller *k* up against the plate and the pinion 8 into mesh with the pinion 7. The motive power is then set free and motion imparted to the driving-shaft, thereby causing the pinion 5 and the gear-wheel 6 to rotate, and thus transmit motion directly to the rollers *b* and *k*. The pressure exerted by the said rollers on the metal plate will cause the said plate to move rearward and pass between the said rollers and will at the same time straighten the said plate longitudinally, so that it will have a perfectly-smooth surface. If it be desired to impart a curve to the plates or sheets before the rollers *b k* are set in motion, the pulley *w* is pressed against the pulley *x*, and the roller *o* consequently swings upward into the path of the plate, leaving the rollers *b k*, and will consequently turn the same upward as it leaves the said rollers *b k*.

From the foregoing description it will be seen that I have provided a very simple and compactly-arranged machine, by the use of which the metallic plates will be effectually rolled with the expenditure of a minimum amount of force. The rolled sheets can be very easily and rapidly removed from the machine and the desired pressure will be constantly exerted on them while passing through the machine. It will be noticed that the several parts of the machine are readily accessible, so that repairs can be made easily and broken parts readily renewed.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a metal-rolling machine, the combination, with the supporting-standards, of a roller having a journal at one end mounted in one of said standards, a lever pivoted near the lower ends of the opposite standard and provided at its upper end with a bearing adapted to receive the journal at the free end of the roller, and mechanism for operating the said roller.

2. The combination, with the supporting-standards, of a rock-shaft journaled in the lower ends of the standard and provided with eccentrics near the said standards, vertically-movable arms supported by the standards and resting on the eccentrics, a roller journaled in the upper ends of the said arms, and mechanism for operating the rock-shaft.

3. The combination of the standards, the upper roller mounted therein, mechanism for rotating the said roller, vertically-movable arms mounted on the inner sides of the standards, a roller journaled in the upper ends of the said arms, and mechanism for adjusting the said arms vertically.

4. The combination of the standards, the front rollers, plates pivoted on the standards in rear of the front rollers, a roller journaled in the upper ends of the said plates, and mechanism for vibrating said plates on their pivots, whereby the roller journaled therein will be moved to or away from the front rollers.

5. The combination of the supporting-standards, the front rollers, plates or arms pivoted to the standards and having their upper edges formed into segmental gears, a roller journaled in the said plates, shafts mounted on the standards and provided with worms engaging the segmental gears, and mechanism for rotating the said shafts.

6. The combination, with the supporting-frame, of the bracket secured on the side of the same, the presser-roller having a journal mounted in the frame and extended into the said bracket, gearing inclosed by the said bracket to impart motion to said roller, and means for operating said gearing.

In testimony whereof I affix my signature in presence of two witnesses.

ELWOOD T. HORNER.

Witnesses:
H. B. BUYD,
C. H. TABKE.