

(No Model.)

3 Sheets—Sheet 1.

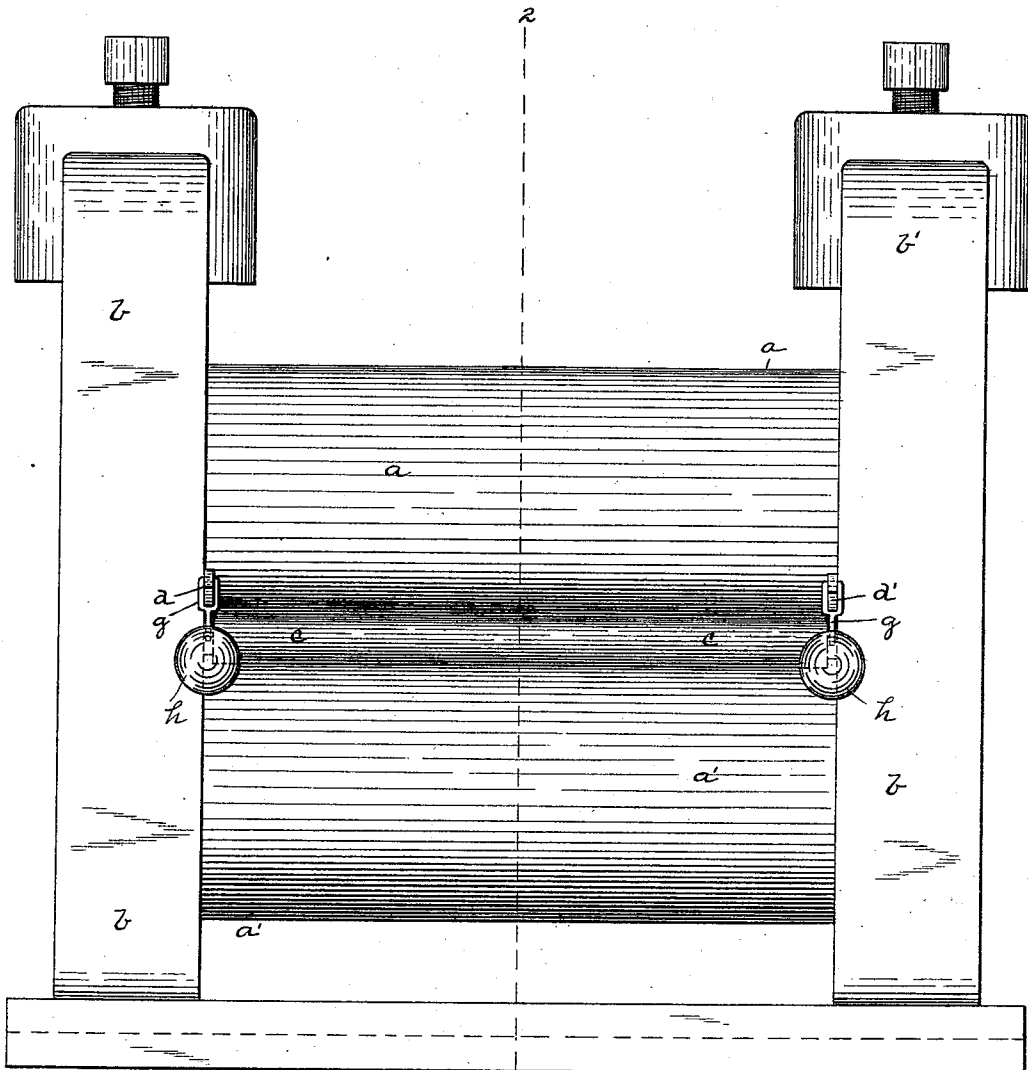
H. E. SHELDON.

FEEDING AND DISCHARGING APPARATUS FOR ROLLING MILLS.

No. 499,259.

Patented June 13, 1893.

Fig. 1.



Witnesses:

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T. A. Dicker

Inventor:
Harry E. Sheldon
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(No Model.)

3 Sheets—Sheet 2.

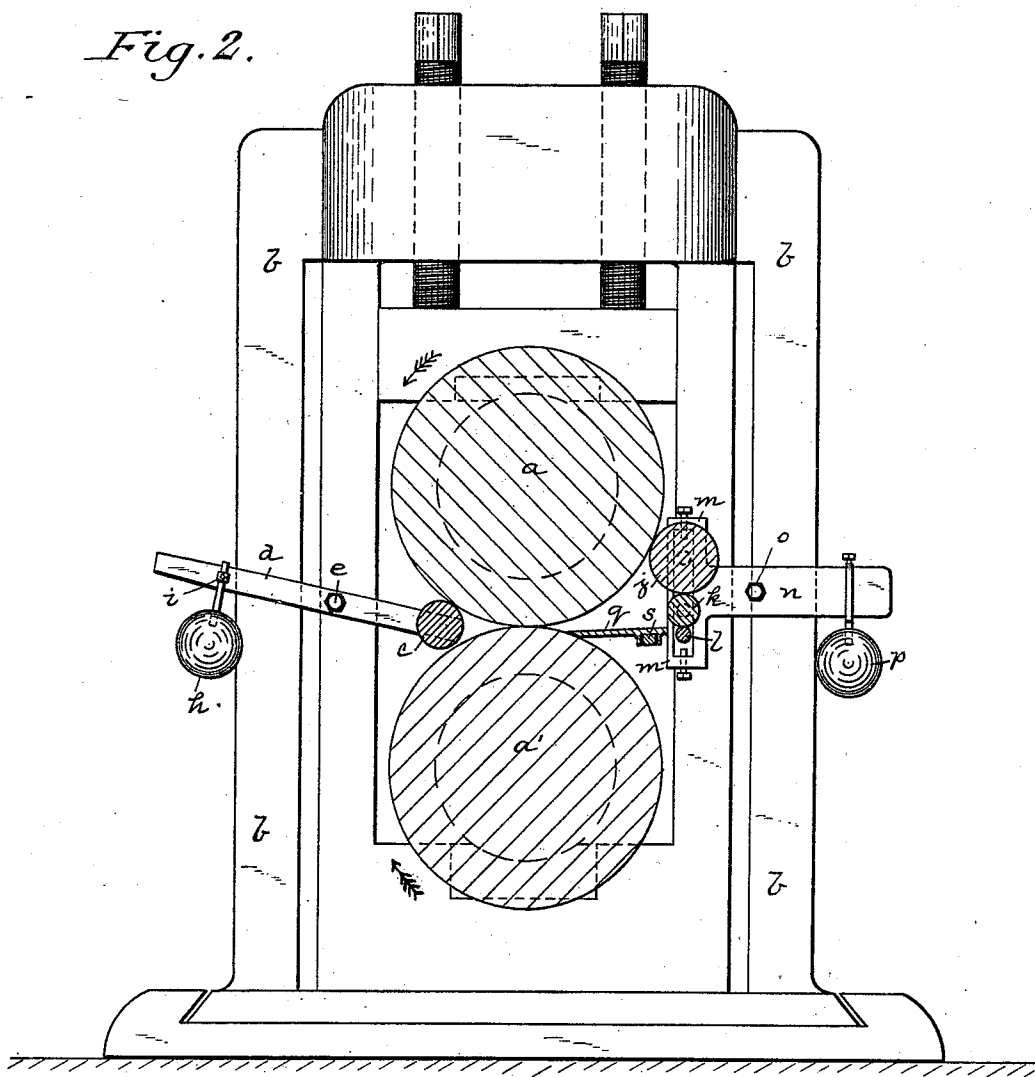
H. E. SHELDON.

FEEDING AND DISCHARGING APPARATUS FOR ROLLING MILLS.

No. 499,259.

Patented June 13, 1893.

Fig. 2.



Witnesses:

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(No Model.)

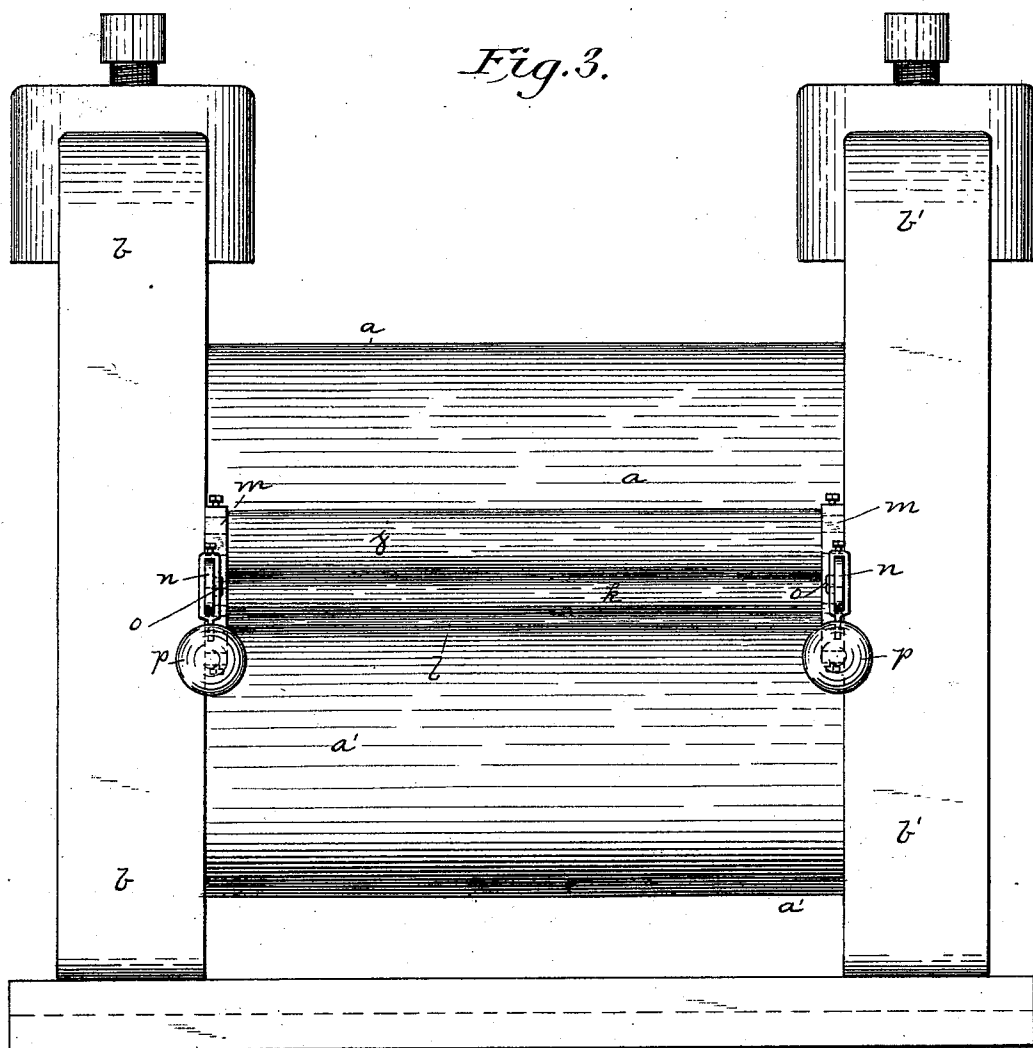
3 Sheets—Sheet 3.

H. E. SHELDON.

FEEDING AND DISCHARGING APPARATUS FOR ROLLING MILLS.

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Patented June 13, 1893.



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F. A. Diddle

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UNITED STATES PATENT OFFICE.

HARRY E. SHELDON, OF LEECHBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JOHN W. KIRKPATRICK, OF SAME PLACE.

FEEDING AND DISCHARGING APPARATUS FOR ROLLING-MILLS.

SPECIFICATION forming part of Letters Patent No. 499,259, dated June 13, 1893.

Application filed April 22, 1892. Serial No. 430,226. (No model.)

To all whom it may concern:

Be it known that I, HARRY E. SHELDON, a resident of Leechburg, in the county of Armstrong and State of Pennsylvania, have invented a new and useful Improvement in Feeding and Discharging Apparatus for Rolling-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an automatic feeding and discharging device for feeding metal sheets to rolls, and for discharging the same therefrom.

In the manufacture of sheet iron, sheet steel, copper, or other sheet metals, such as may be employed for tinning or coating with other metals, or for various purposes, the last step in the process after the sheets have been separated from the packs, sheared and annealed, consists in passing each sheet separately, when cold, through a pair of rolls to finally reduce each sheet to an even gage throughout its entire area, as well as to impart to the same a smooth, flat polished surface. Heretofore this step in the manufacture of iron or steel sheets has been attended with much difficulty and expense, owing to the inability to feed the sheet uniformly to the rolls, and to the fact that it required the employment of skilled labor to perform this operation. It is almost invariably the case in the rolling of sheet iron and steel that after the packs have been separated into separate sheets there will be a difference in the gage of the separate sheets, some being thicker at the sides than at the intervening points, others thicker at the middle and tapering down toward their sides. This inequality in the gage of the separate sheets is due to the unavoidable expansion and contraction of the rolls during the rolling of the sheets. In cold rolling sheets, therefore, of greater gage at the middle, it was necessary to heat the cold rolls at or adjacent to their necks to make provision for this thickness of sheets at the middle; or, where the sheets were thicker at the sides, it was necessary to heat the central portion of the cold rolls for the same reason. Even after making this provision, however, it was practically impossible for the roller to handle and feed the sheets to the rolls in such a manner as to present the front end of every

sheet evenly to the roll without sagging on one side or the other. Owing to this inequality in the gage of the sheets, and the inability of the roller to feed the sheets evenly to the roll, the sheets upon being fed to the rolls were liable to pinch or buckle so forming ribs and rough portions on the sheets which rendered the sheets useless. Even with the exercise of great skill and care on the part of the roller, it was impossible to avoid the loss of many sheets due to this pinching or buckling action.

The object of my invention is to provide a device whereby the sheets may be fed uniformly to the roll without liability of the pinching of the sheets during their passage through the rolls, and whereby the sheets may be discharged therefrom without further handling.

To these ends my invention consists, generally stated, in combining with a pair of rolls mounted in suitable housings, an idle roller journaled in pivoted supports in front of said rolls and adapted to feed the sheets to the pass between said rolls, whereby the sheets are fed uniformly to said rolls, and all liability of the sagging of said sheets on entering the pass between said rolls is removed, thereby preventing the pinching of the same.

My invention further consists in mounting two or more idle rollers behind the said rolls, one above the other, and a bottom roller of smaller diameter than the one above, whereby the sheets on passing from the rolls are carried through said idle rollers and delivered down onto a suitable platform or truck ready to receive them; all of which will be more fully hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings in which—

Figure 1 is a front view of a pair of rolls, my improved feeding device applied thereto. Fig. 2 is a cross section on the line 2—2, Fig. 1. Fig. 3 is a rear view showing the discharging device.

Like letters indicate like parts.

The rolls *a a'* are mounted in suitable housings *b b'* and are made adjustable therein by means of nuts and setting down screws in the

ordinary manner. An idle friction roller *c* is journaled in the ends of the levers *d d'* which are pivoted to the housings *b b'* at *e*. The roller *c* may be hollow or solid, as may be desired, and is arranged at the entrance of the pass between the rolls *a a'*. The sheet is fed to the rolls between the upper roll *a* and the idle roller *c*, and for this reason the said roller *c* is either in contact with or in very close proximity to the upper roll *a*, and in order to provide for the adjusting of the idle roller *c* to and from the upper roller *a*, as may be required from time to time, the levers *d d'* which carry the rollers *c* are provided with the arms *g* carrying the weights *h*. The position of the weights *h* is regulated by means of the set screws *i* on the arms *g* according as the roller *c* is to be brought into closer proximity to the upper roller *a* or withdrawn therefrom. It will be necessary to regulate the distance between the roller *c* and the roll *a* according to the thickness of the sheets to be rolled, and according as it may be necessary to increase or diminish the pressure of the roller *c* against the sheets.

The discharging device consists of the friction rollers *j k l*, all mounted the one above the other in the bearing blocks *m*. The top roller *j* is arranged to be in contact with the upper roll *a* whereby said roller *j* is rotated by the friction created by the rotation of the roll *a*. The preferable arrangement is to have the roller *k* of smaller diameter than the roller *j* and of greater diameter than the roller *l*, and as said roller *k* is in contact with the roller *j*, any rotation on the part of the roller *j* will impart to the roller *k* a rotation opposite to that of the roller *j*. Likewise the roller *l*, which is preferably made of smaller diameter than the roller *k*, will receive a rotation opposite to that of the roller *k*, said roller *l* being in contact with said roller *k*. While I have described the rollers *j k l* as varying in diameter, I do not confine myself to this arrangement, as the said rollers may all be of the same diameter to accomplish the same result. Secured to the bearing blocks *m* are the levers *n*, said levers being pivoted to the housings *b b'* at *o*, whereby said bearing blocks are supported. To provide for the adjusting of the bearing blocks at different heights, to correspond with any adjustment of the roll *a*, and in order to keep the roller *j* in contact with said roll *a*, the levers *n* are provided with the weights *p* adapted to slide to and from the levers *n* and to be fixed at different points thereon by means of set screws or other like devices. A guide plate *q* is supported on a cross bar *s* fitted in the housings, said guide plate being adapted to support and guide the sheets as they pass from the rolls *a a'* to the pass between the rollers *k* and *l*.

The operation of my improved feeding and discharging device is as follows:—The rolls *a a'* having been adjusted at the proper height, and the weights *h* on the levers *d d'*

having been adjusted at such a point thereon as to bring the idle roller *c* into contact with or close proximity with the top roll *a*, the sheet is fed to the idle roller *c*. With the rolls *a a'* driven in the direction indicated by the arrows the friction created between the roll *a* and the idle roller *c* will cause the roller *c* to rotate in an opposite direction to that of the roll *a*, thus acting to feed forward the sheet to the pass between the rolls *a a'*. In this manner the sheet is supported uniformly across its entire body previous to its passage through the rolls *a a'*, by the roller *c*, and is carried by the rotation of the roll *a* to the pass between the rolls *a* and *a'*, the front edge of said sheet being presented evenly to said rolls, so that there is no liability of the sagging of the sheets and the consequent pinching and buckling of the same. The sheet then passes from the rolls *a a'* to the guide plate *q*, whence it passes between the rollers *k* and *l*. The momentum acquired by the sheet as it is carried through the rolls will carry said sheet clear of the circumference of the roller *l* so that said sheet is free to drop flat down upon the platform or truck ready to receive it, thus permitting said sheet to drop down out of the way of the next succeeding sheet so that any interference of one sheet with another is avoided. In this manner the sheets are arranged one above the other automatically upon the platform or truck without the necessity of the employment of any person to catch the sheets as they emerge from the rolls as has heretofore been the custom. It is apparent that the rollers *j k l* may all be of the same diameter, provided they are of such a diameter that the momentum acquired by the sheets in passing through the rolls *a a'* will carry said sheets a sufficient distance beyond the said rollers so as to permit said sheets to drop clear of the circumference of said rollers.

Although I have referred to my invention as being particularly applicable to the cold rolling of metal sheets, I do not confine myself to this particular application of it, but include in its scope any other kind of metal rolling to which it may be found applicable.

By the employment of the above feeding mechanism all necessity of heating the rolls before rolling is obviated and the necessity of the employment of skilled labor is done away with. The sheets may be fed to the idle roller *c* by any ordinary workman as the idle roller itself feeds the sheets uniformly to the rolls without the liability of the pinching of the same. The discharging device furthermore does away with the employment of an extra laborer to receive the sheets as they pass from the rolls to arrange them in order upon the wagon or truck to carry them away.

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

1. The combination with a pair of rolls mounted in suitable housings, of an idle roller

journalled in pivoted supports in front of said rolls and adapted to feed metal sheets thereto, substantially as and for the purposes set forth.

5 2. The combination with a pair of rolls mounted in suitable housings, of an idle roller journalled in weighted supports pivoted in front of said rolls and adapted to feed metal sheets thereto, substantially as and for the purposes set forth.

10 3. The combination with a pair of rolls mounted in suitable housings, of an idle roller, levers pivoted to said housings and supporting said idle roller in front of said rolls, said levers carrying weights whereby said roller
15 may be adjusted at different positions with relation to said roller, substantially as and for the purposes set forth.

20 4. The combination with a pair of rolls mounted in suitable housings, of levers pivoted to said housings in the rear of said rolls, said levers carrying bearing blocks adapted

to receive two or more idle rollers, the one above the other, the bottom roller being of smaller diameter than the one above and said levers carrying weights whereby said rollers
25 may be adjusted at different heights, substantially as and for the purposes set forth.

5. The combination with a pair of rolls mounted in suitable housings, of an idle roller arranged in front of said rolls and adapted to
30 feed metal sheets to said rolls, two or more idle rollers arranged in the rear of said rolls the one above the other, the bottom roller being of smaller diameter than the one above, said rollers being driven by said rolls, sub-
35 stantially as and for the purposes set forth.

In testimony whereof I, the said HARRY E. SHELDON, have hereunto set my hand.

HARRY E. SHELDON.

Witnesses:

J. N. COOKE,

ROBT. D. TOTTEN.