(No Model.) 2 Sheets—Sheet 1.

S. McCLOUD.

MACHINE FOR REDUCING OLD RAILS.

No. 395,339. Patented Jan. 1, 1889.

Fig. 2.

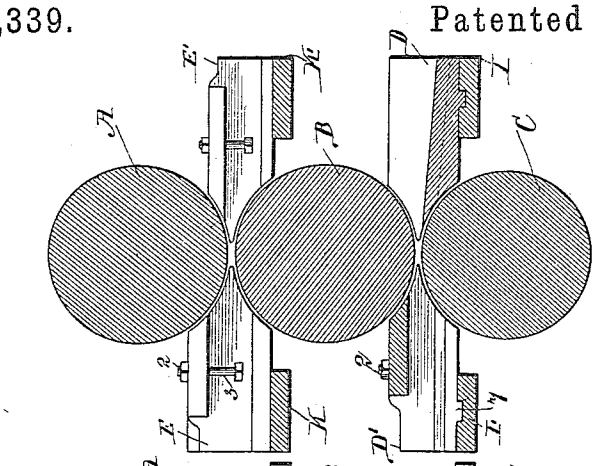
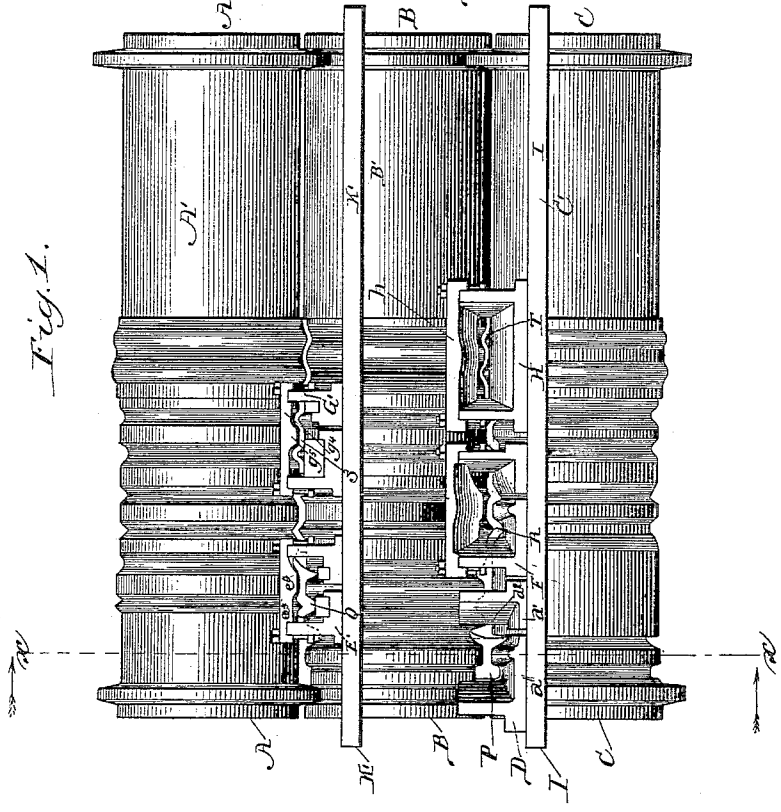


Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

S. McCLOUD.

MACHINE FOR REDUCING OLD RAILS.

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Fig. 3.

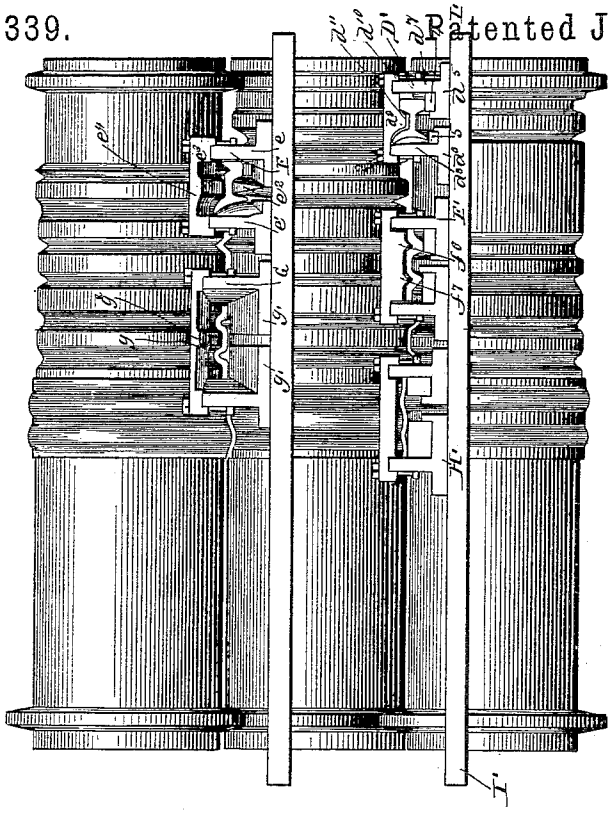


Fig. 4.

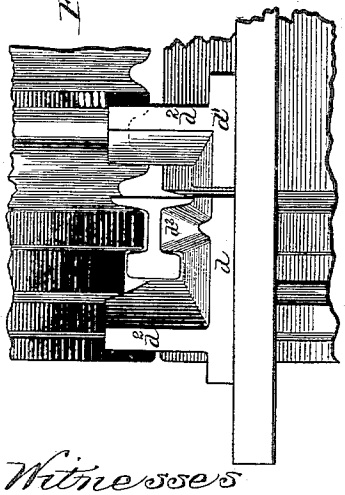
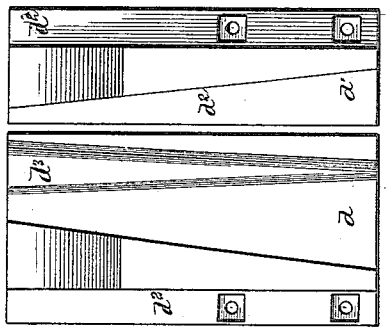


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR REDUCING OLD RAILS.

SPECIFICATION forming part of Letters Patent No. 395,339, dated January 1, 1889.

Application filed October 13, 1888. Serial No. 288,040. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY MCCLOUD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Reducing Railroad-Rails, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention has relation to that class of machines designed more especially for reducing railroad-rails (particularly old steel rails) to plates or blanks, an example of this type of machine being illustrated in Letters Patent No. 380,504, granted to me April 3, 1888.

As in the ordinary form of railroad-rails the head portion of the rail contains considerably more metal than the flange portion, it is found that during the operation of reducing such rails to plates there is a tendency of the partially-reduced rail to pass from the rolls in a somewhat curved shape. This is due in part to the fact that as the excess metal of the head portion of the rail is compressed it is apt to be extended in the direction of the length of the rail to greater extent than is the metal in the flange portion of the rail, and is due to the further fact that if there be any variation or irregularity in the diameter of the rolls or their setting there is a tendency on the part of the rail to turn upward as it leaves the rolls, while by the construction of rolls illustrated in my above-mentioned patent I have in great measure overcome the tendency of the rails to curve laterally in passing from the rolls.

The object of my present invention is to provide mechanism whereby the rails may be directed with certainty between the rolls and may be so securely held during the reducing operation that all danger of their passing from the rolls in curved form will be avoided.

To this end my invention consists in the novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly defined in the claims at the end of this specification.

Figure 1 is a front view of a machine having my present improvements applied thereto. Fig. 2 is a view in vertical transverse section on line *x x* of Fig. 1. Fig. 3 is a view of the machine in rear elevation. Fig. 4 is an enlarged detail front view of the delivery-guide for the first pass. Fig. 5 is a plan view of the delivery-guide shown in Fig. 4.

As the rolls A, B, and C (illustrated in the annexed drawings) are substantially the same in shape as those shown in my Patent No. 380,504, the peculiarities and advantages incident to such shapes need not be here particularly described, it being sufficient to state that in the present construction, as in that defined in said patent, there are five passes given to the rail during the reducing operation in addition to the usual flat passes. The portions of the rolls at which these five passes occur are designated, respectively, by the letters P, Q, R, S, and T, the flat passes occurring between the portions of the rolls A′, B′, and C′, as particularly described in said patent.

In front of that portion P of the rolls B and C by which the first pass of the rails is effected is placed the delivery-guide D, and at the rear side of such rolls in corresponding position is placed the receiving-guide D′, and in like manner for effecting the pass at Q are placed the delivery and receiving guides E and E′, and at the pass R the delivery and receiving guides F and F′, at the pass S the delivery and receiving guides G and G′, and at the pass T the delivery and receiving guides H and H′. The several delivery-guides D, F, and H are mounted upon the transverse beam or bar I, that extends across the front of the lower roll, C, and is suitably sustained by posts or pillars (not shown) in well-known manner, and the receiving-guides D′, F′, and H′ are in like manner mounted upon a transverse beam or bar, I′, suitably sustained at the opposite side of the roll C. So, also, the delivery-guides E and G are mounted upon the transverse beam or bar K, extending across the back of the roll B, and the receiving-guides E′ and G′ are mounted upon the transverse beam or bar K′, that extends across the front of the roll B.

The delivery-guide D is shown as composed of two castings, the bases *d* and *d′* of which are bolted to the transverse bar I, although, if desired, this guide may be formed in a single piece, my purpose of forming it of two parts

being merely for convenience of construction. The guide D, when its two sections are set together for use, comprises a box or trough having inwardly-converging sides d^2 and a central rib, d^3, preferably cast in one piece with the bottom plate of the section d of the guide, and by preference, also, of reduced size from back to front, as more particularly shown in Fig. 4 of the drawings.

My object in forming the guide D with the expanded front portion and with its sides inwardly converging, and in forming the central rib, d^3, of this guide of reduced size at its front end, is to facilitate the introduction of the rail into the guide. At its rear end the central rib, d^3, of the guide is expanded to a size, by preference, approximately equal to the space between the head and flange of the rail to be reduced, and the upper face of this rib d^3 at its rear end is about on a line with the periphery of the roll C; hence it will be seen that when the rail to be reduced has been placed within the guide D it will rest upon the rib d^3, and the rear portion of this rib will firmly bear against the under side of the head of the rail, so as to securely hold the rail as it is subjected to the reducing action of the rolls in making the first pass.

The receiving-guide D′ is shown as formed of the separate castings d^5 and d^6, the bottom plates of which are bolted to the transverse beam or bar I′, although, if desired, these parts of the receiving-guide may be formed in a single piece.

The side walls, d^7 and d^8, of the receiving-guide D′ are preferably parallel, and upon these side walls rests the top plate or cover, d^9, that is held in place by means of bolts 2, that set within slots 3 in the side walls, d^7 and d^8, and pass through suitable holes in the cover d^9, that is held in place by the nuts. Upon the under face of the cover d^9 is preferably formed flanges d^{10}, to embrace the upper edges of the side walls, d^7 and d^8, of the guide, and upon the under face of this cover is also formed the rib d^{11}, that extends from front to back thereof in such position as to enter the space between the partially-compressed flange and head portions of the rail. The purpose of this rib d^{11}, is to bear against the inner side of the partially-compressed rail-head, and assist in counteracting any tendency of the rail to curve in lateral direction. It will be observed that the inner end of the top plate or cover, d^9, extends into close proximity to the roll B, and is beveled to conform to the periphery of the roll, the purpose of this construction being to enable the top plate or cover, d^9, to act not merely as an upper guide-bar to overcome any tendency of the partially-reduced rail to curve in upward direction, but as well, also, to keep the periphery of the roll B at such point clean from scales or scraps.

My purpose in forming the top plate or cover, d^9, separate from the side walls, d^7 and d^8, is to enable this cover to be readily removed in case any fragments of metal should accumulate at the inner end of the receiving-guide and avoid the necessity of displacing the entire guide to remove such accumulation.

Upon the bottom plates of the sections of the receiving-guide D′ and between the side walls are preferably placed wrought-iron bars 4 and 5, upon which will bear, respectively, the head and flange portion of the rails as they pass from the rolls, these bars being by preference set within channels formed in the bottom plates and being provided with lugs 7, that enter corresponding seats in such plates and serve to guard the bars against displacement.

From the construction as thus far defined it will be seen that as the rail to be reduced makes its first pass between the rolls it is securely held against curving upward by the top plate or cover, d^9, and against curving in lateral direction by the central rib, d^3, of the delivery-guide and by the rib d^{11} of the receiving-guide, each of these ribs bearing against the head portion of the rail where the metal is of such thickness that any tendency to curve can be with certainty resisted. It is plain, also, that by thus providing guide mechanism to bear against the head portion of the rail during its passage through the rolls a much more secure resistance to lateral curvature is secured than would be possible if the resistance were offered merely upon the flange of the rail, since, as will be seen by Fig. 3, the flange is partially bent during its passage through the rolls, and if the guide bore simply against this flange the lateral pressure incident to any unequal compression and extension of the metal would be so great as to straighten the partially-bent flange and allow the rail to pass from the rolls in slightly-curved shape.

The delivery-guide E, opposite that part Q of the rolls through which the second pass of the rail occurs, has its lower portion by preference formed of separate parts, the side walls, e and e', of this delivery-guide converging from front to back and being provided with a central rib, e^2, of tapering contour similar to the central rib, d^2, of the delivery-guide D, and adapted to bear in like manner against the partially-compressed head of the rail. This delivery-guide E is, however, provided with a top plate or cover, e^3, that rests upon the side walls, e and e', of the guide, and is bolted thereto in the same manner as the cover d^9 is bolted to the side walls of the receiving-guide. The under face of this cover e^3 is provided, by preference, with a rib, e^4, that extends from front to back of the cover in position to project between the head and flanged portions of the rails, and bear upon the partially-compressed head as it is delivered to the rolls. The receiving-guide 8 is similar in construc-

tion to the receiving-guide D′, the dimension of the parts being modified to correspond with the change in the shape of the rail incident to its partial compression. In this guide, as in the receiving-guide D′, the cover e^5 is provided with a rib, e^6, that extends within the space between the partially-compressed head and flanged portions of the rail, and aids in guarding the rail against tendency to curve in lateral direction.

The delivery-guide F is similar in construction to the delivery-guide E, last described, the precise dimensions of this guide and its ribs being simply modified, as shown, to correspond with the change in the form of the rail incident to its further reduction. The receiving-guide F′ has its lower portion similar in construction to the corresponding part of the receiving-guide E′; but the top plate of this receiving-guide F′ is provided, preferably, with two parallel ribs, f^6 and f^7, extending from end to end thereof, and adapted to enter the grooves formed in the head and flange portions of the rail during the corresponding pass, R, of the rolls.

The delivery-guide G, opposite that portion of the rolls through which the fourth pass of the rail occurs, has its lower portion preferably formed of two parts converging from front to rear, and has its top plate or cover, g, bolted thereto in the same manner as the top plates or covers of the guide hereinbefore described. In this delivery-guide, however, the bottom plate, g', of the guide is not provided with a central rib, since by the time the fourth pass is made the rail has assumed such form that the web or body portion of the rail is flush with the bottom plate of the guide. The top plate or cover, g, of this delivery-guide is provided, however, with a central rib, g^2, that enters the space between the compressed head and flanged portion of the rail, and serves to accurately guide the rail to the rolls and aid in preventing any tendency of the rail to curve in lateral direction. The receiving-guide G′ is similar in construction to the receiving-guides D′ and E′, above described, the ribs upon the bottom plate and upon the top plate or cover of this receiving-guide being modified to conform to the changed shape of the rail; but in this construction, as in the receiving-guides D′ and E′, the top plate, g^4, is provided with a central rib, g^5, that enters the space between the compressed head and flanged portions of the rail, and aids in preventing any tendency to bend in either direction.

The delivery-guide H, through which the fifth pass of the rail is effected, has its lower portion formed with converging bottom and top and side walls similar to the delivery-guides already described; but in this construction the lower portion of the guide is shown as formed as a single casting with the top plate of the guides, already described. The under side of the top plate of the delivery-guide H is by preference provided with a central rib, h, adapted to enter the space between the metal formed from the head and flanged portions of the rail; but it is obvious that since the rail when it reaches the fifth pass is of almost uniform thickness there does not exist the same necessity for the use of a central guide as in the prior passes of the rail. The rib h, however, will serve as an aid in guiding the rail with accuracy between the rolls, and will aid in preventing any lateral movement of the rail as it passes therefrom. The receiving-guide H′ has its lower portion similar to the corresponding part of the receiving-guide G′, and in this guide H′ the top plate is flat upon its under side, since the blank after it has made the fifth pass through the roll is of uniform thickness and very nearly flat.

After the blank has left the fifth pass it will receive one or more final passes through the flat portions A′, B′, and C′ of the rolls.

It will be readily understood that the precise details of construction of the guide mechanism above described may be varied without departing from the spirit of my invention, and that certain features of the invention may be employed without its adoption as an entirety. To such details therefore I do not wish my claims to be understood as restricted.

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

1. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib adapted to bear upon the under side of the head portion of the rail, substantially as described.

2. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib adapted to bear upon the under side of the head portion of the rail, said rib being of tapering shape from back to front, substantially as described.

3. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having side walls converging from front to back and having a central rib adapted to bear upon the under side of the head portion of the rail and tapering from back to front, substantially as described.

4. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide the top and bottom plates of which are provided with ribs or elevations adapted to bear upon the under side of the head portion of the rail, substantially as described.

5. The combination, with a set of rolls for reducing railroad-rails, of a delivery-guide having a rib for bearing upon the under side of the head portion of the rail, and a receiving-guide having a rib for bearing against the head portion of the rail upon the opposite side of the rail, substantially as described.

6. The combination, with a set of rolls for reducing railroad-rails, of a receiving-guide

having a rib arranged to extend into the space between the head and flange portions of the rails as it passes through the rolls, substantially as described.

7. The combination, with a set of rolls for reducing railroad-rails, of a receiving-guide having a top plate extending in proximity to the periphery of the rolls, substantially as described.

8. The combination, with a set of rolls for reducing railroad-rails, of a guide having a removable cover, substantially as described.

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