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T. V. ALLIS.

METHOD OF FEEDING PACKS OF THIN METAL STRIPS FROM HEATING FURNACES.

(Application filed July 18, 1900.)

(No Model.)

Fig. 1.

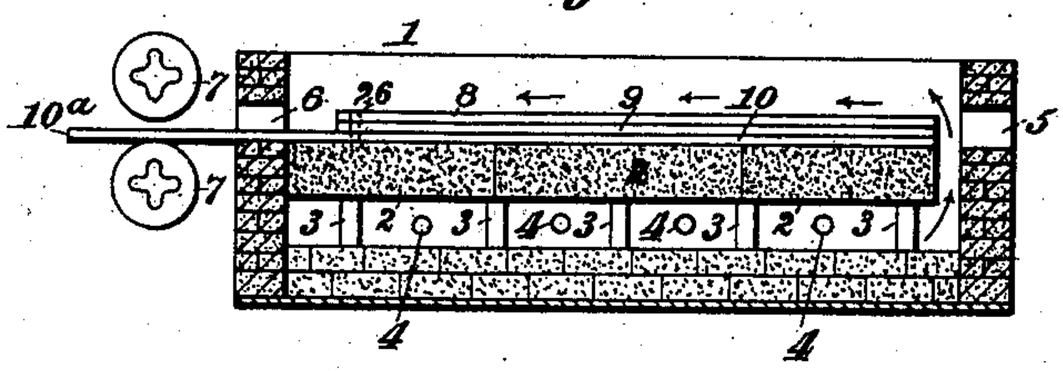

Fig. 2.

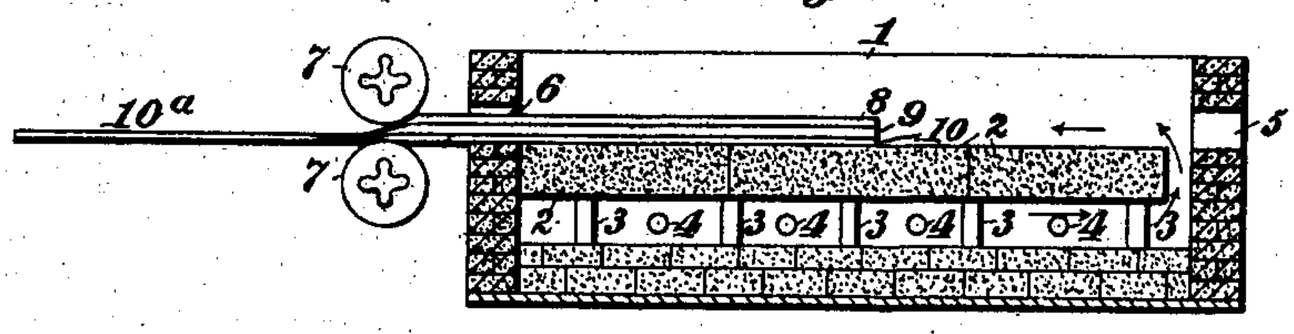

Fig. 3.

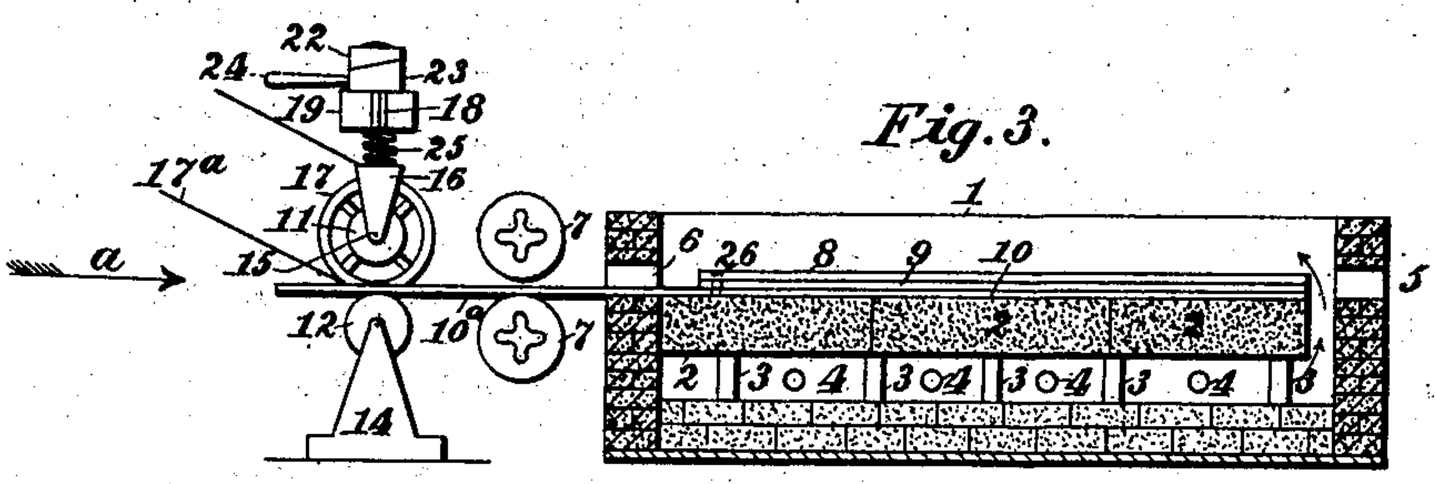

Fig. 4.

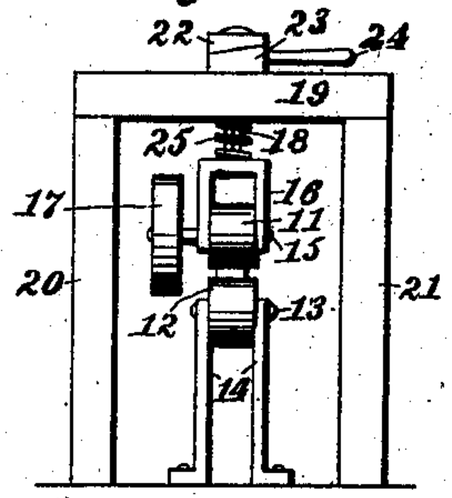

Fig. 5.

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UNITED STATES PATENT OFFICE.

THOMAS V. ALLIS, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE INTERNATIONAL TIN PLATE CORPORATION, A CORPORATION OF NEW JERSEY.

METHOD OF FEEDING PACKS OF THIN METAL STRIPS FROM HEATING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 693,819, dated February 18, 1902.

Application filed July 18, 1900. Serial No. 24,052. (No model.)

To all whom it may concern:

Be it known that I, THOMAS V. ALLIS, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in the Method of Feeding Packs of Thin Metal Strips from a Heating-Furnace, of which the following is a specification.

My invention is an improved method of feeding a pack of thin metal strips from a heating-furnace to a rolling-mill; and it consists in attaching to said pack a leading-strip and projecting said leading-strip outside of the furnace and between or through the reduction-rolls, so that such leading-strip may be utilized either by hand or otherwise for drawing the heated pack from the furnace into the bight of the reduction-rolls, whereupon said reduction-rolls will complete the withdrawal of said pack. Heretofore an ordinary pusher-rod has been used to convey the metal pack along the furnace-floor and through the rear or delivery end of the furnace into the bight of the rolls. When the individual strips or plates are thick enough to support themselves against the force exerted by the pusher-rod, this manner of delivery is not objectionable; but when the strips are so long and thin that they will loop up or buckle in the furnace it is impossible to deliver them through the discharge-opening by means of a pusher-rod. By my improved method the packs of thin strips are pulled or drawn from the furnace into the bight of the rolls, making it an impossibility for them to become distorted.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a longitudinal view in section through the center of a furnace with a pack of thin metal strips being heated therein, showing also a leading-strip, which leading-strip in this case forms a part of such pack, projecting outside of the furnace and between or through and beyond the reduction-rolls adjacent to said furnace, which projecting end is adapted to be engaged by said rolls to draw the pack from the furnace. Fig. 2 is a construction similar to that shown at Fig. 1; but in this view the pack is shown in the bight of the rolls and is being reduced to the thickness of the leading-strip. Fig. 3 is a view similar to that shown at Fig. 1 with the addition of feeding-rolls located in close proximity to the reduction-rolls, which feeding-rolls are adapted to supersede the use of the reduction-rolls for drawing the packs from the furnace. In this view the upper feed-roll is shown elevated and out of engagement with the leader, sectional view of the cross piece or beam, by which such upper roll is supported, and broken view of the driving-belt. Fig. 4 is an end elevation of the feed-roll construction looking in the direction of arrow *a* of Fig. 3. Fig. 5 is a detail view of a pack of thin metal strips, showing the leading-strip attached to the front end of such pack.

Its construction and operation are as follows:

1 represents the furnace; 2, the floor-brick, supported on the stools 3.

4 represents ordinary gas-pipes for heating.

The front end of the furnace is provided with the opening 5 to receive the packs, and 6 is the delivery-opening in the rear end.

7 represents the reduction-rolls, while for convenience of illustration the ordinary housings are omitted, and such rolls are situated close to the delivery end of the furnace.

The packs shown at Figs. 1, 2, and 3 are composed of the thin strips 8, 9, and 10. The latter or bottom strip (see Fig. 1) is extended to form the leader 10^a, which in this case is part of said strip, and such leading-strip or leader extends out through the delivery-opening 6 and through the reduction-rolls far enough so that such leader can be grasped and the heated pack drawn into the bight of the rolls, as shown at Fig. 2, and delivered from thence onto a table or other like support. (Not shown.) The reduction-rolls do not, as will be observed at Fig. 1, come in contact with the leader 10^a. This leader is as thin or thinner than the whole pack will be after passing through said reduction-rolls,

which always stand apart sufficiently to allow a free passage of said leading-strip, whereby the reduction-rolls may freely revolve without disturbing the pack within the furnace, or the leading-strip may be so proportioned in thickness with relation to the thickness of the pack before rolling and the finished strips in the pack after rolling that the reduction-rolls may also be used as feed-rolls to draw the pack from the furnace into their bight by simply setting down on the screws controlling the top roll (not shown) and the space between said reduction-rolls. In other words, the leading-strip may be of the same thickness as the combined thickness after reduction of the strips forming the pack, said top roll of the reduction-rolls being raised sufficiently to clear the leading-strip resting between the reduction-rolls, which, as a rule, are constantly revolving. When the pack has become properly heated for rolling, the top roll of said reduction-rolls may be lowered to the position where it engages the leading-strip with the required force necessary to draw the pack from the furnace into the bight of said rolls, the leading-strip gaging the opening between said rolls, which opening represents the collective thickness of the several leaves in the pack after rolling; but to avoid changing a fixed position of the top reduction-roll an arrangement is shown at Fig. 3 for drawing the heated packs into the bight of the reduction-rolls, which consists of the two feed-rolls 11 and 12. The latter or lower roll is mounted on the short shaft 13, which shaft is journaled in the standards 14, resting on the floor. The upper roll 11 is mounted on the shaft 15, which shaft is journaled in the hangers 16. 17 is the driving-pulley for this upper roll, and such pulley is mounted on an extension of the shaft 15, as shown more clearly at Fig. 4.

18 is a shank of the hanger 16, which shank projects through the cross-beam 19, supported on the stanchions 20 and 21, also supported on the floor.

22 is a stationary cam secured to the outer projecting end of the shank 18, which cam is adapted to be engaged by the horizontally-movable cam 23 through the medium of its handle 24.

25 is a spring interposed between the under side of the cross-beam 19 and the upper surface of the hanger 16 to effect a working engagement of the feed-roll 11 with the leader 10^a.

When the metal pack is being heated, the upper feed-roll is by means of the previously-described cam mechanism raised out of contact with the leader 10^a, as shown at Fig. 3. As soon, therefore, as the pack is properly heated for rolling the upper roll, which, by the way, is continually in motion, is lowered to engage with said leader to draw the pack out of the furnace and into the bight of the reduction-rolls. When the end of the pack engages with the feed-roll 11, it will automatically lift such roll against its spring-pressure, so as to allow such pack to pass the feed-rolls, or, if desired, the upper roll can be lifted by means of the cam before the end of the pack reaches it.

In Fig. 5 the leader 10^b is a separate strip having one end secured to the end of the pack during its heating and rolling process. This separate leading-strip may be inserted between the strips of the pack with equally good results.

It is not necessary that the leading-strip should be of the same width as the pack, as all that is required is that such strip shall be of sufficient strength to be utilized for drawing the pack from the furnace either through the medium of the reduction-rolls, feed-rolls, or any other suitable means.

As before mentioned, this method above described is especially intended for use in connection with very thin and long metal strips not adapted to be ejected or discharged from the furnace by the ordinary means employed for discharging or, in fact, any means where the force exerted is against the end of the pack and toward the rolls. It will therefore be readily seen that where the packs of metal strips are several feet long and thin in proportion they cannot be pushed out of the furnace by reason of buckling or doubling upon themselves, as before stated, but must be pulled or drawn out.

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

1. The herein-described method of delivering a pack of metal strips from a heating-furnace to reduction-rolls adjacent thereto, which consists in securing a leading-strip to said pack, which leading-strip is of less thickness than said pack before reduction, and projecting such leading-strip out of the furnace and between said reduction-rolls so that, said pack may be drawn into the bight of said rolls through the medium of said leading-strip as described and for the purpose set forth.

2. The method of delivering a pack of metal strips from a heating-furnace to reduction-rolls adjacent thereto, which consists in temporarily securing a leading-strip to said pack which leading-strip is relatively thinner than such pack before reduction, and projecting such leading-strip through the discharge-opening of the furnace and between the reduction-rolls where it will remain passive until said pack is ready for reduction when said leading-strip is made the medium for withdrawing said pack from the furnace into the bight of said reduction-rolls, as described and for the purpose set forth.

3. The method of delivering a pack of metal strips from a heating-furnace to reduction-rolls, which consists in temporarily securing a leading-strip to said pack, which leading-

strip is of less thickness than said pack before reduction, projecting said leading-strip through the discharge-opening of said furnace and between said reduction-rolls, said leading-strip also being of less thickness than the opening between said reduction-rolls before the said pack is reduced, as described and for the purpose set forth.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 17th day of July, A. D. 1900.

THOMAS V. ALLIS.

Witnesses:
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