J. SIMPSON.

TRANSFER MECHANISM FOR HOTBEDS.

APPLICATION FILED FEB. 18, 1909.

1,015,350.

Patented Jan. 23, 1912.

2 SHEETS—SHEET 1.

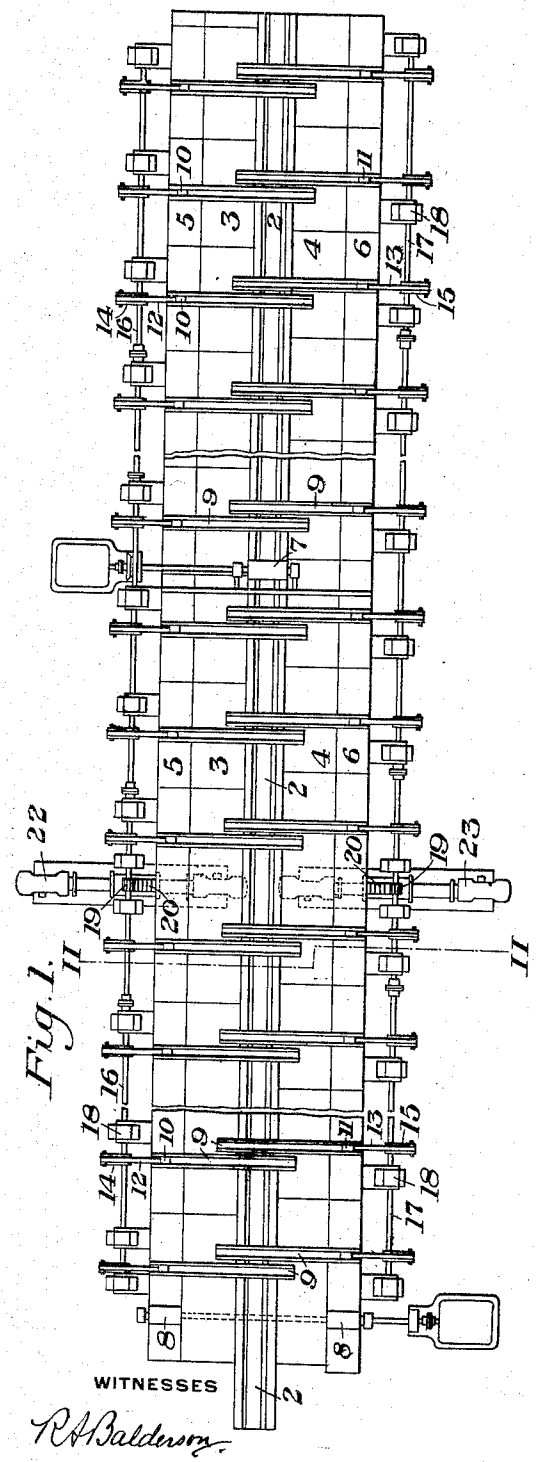

Fig. 1.

WITNESSES

R. A. Balderson

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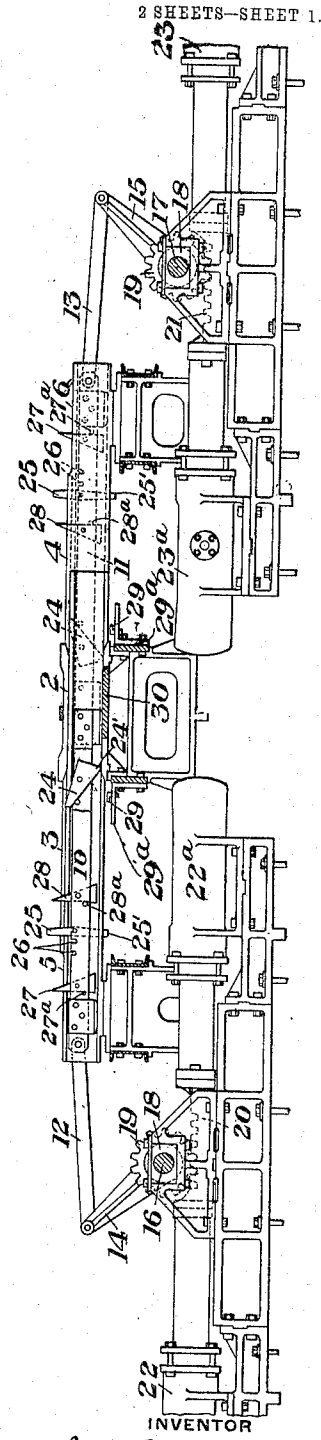

Fig. 2.

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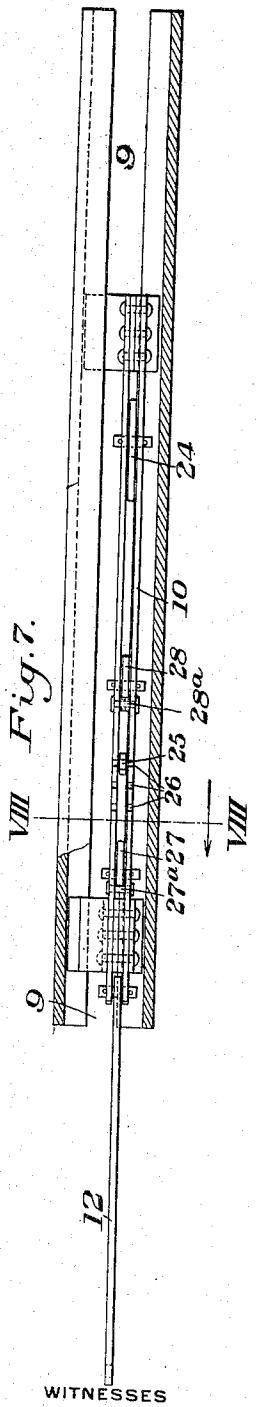

Fig. 7.

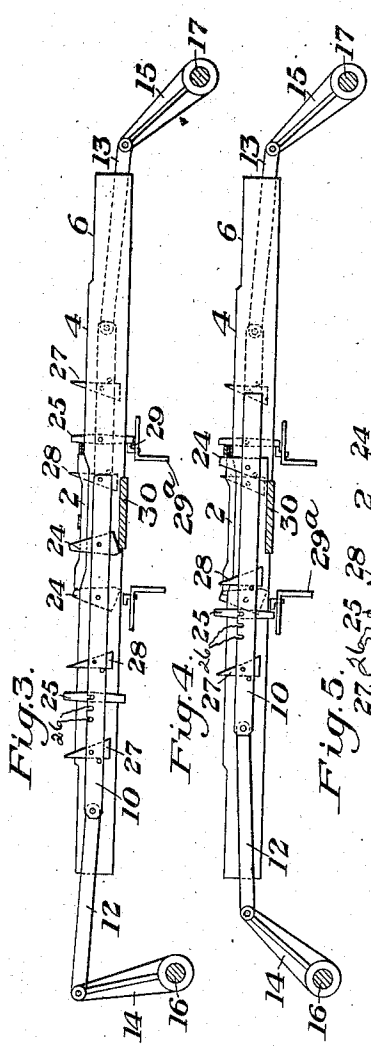

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

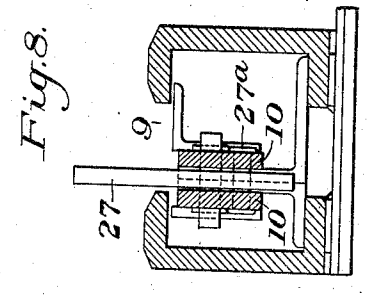

Fig. 8.

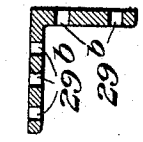

Fig. 9.

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES SIMPSON, OF McKEESPORT, PENNSYLVANIA, ASSIGNOR TO NATIONAL TUBE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

TRANSFER MECHANISM FOR HOTBEDS.

1,015,350. Specification of Letters Patent. Patented Jan. 23, 1912.

Application filed February 18, 1909. Serial No. 478,536.

To all whom it may concern:

Be it known that I, JAMES SIMPSON, of McKeesport, Allegheny county, Pennsylvania, have invented a new and useful Transfer Mechanism for Hotbeds, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a hot bed having transfer mechanism constructed and arranged in accordance with my invention. Fig. 2 is a sectional side elevation of the same on a larger scale taken on the line II—II of Fig. 1. Fig. 3 is a sectional side elevation showing the transfer mechanism as located on opposite sides of the longitudinal center line of the hot bed in the position assumed in transferring a rolled blank from the center of the bed sidewise to the right-hand of the bed and piling the blank on top of previously transferred blanks. Fig. 4 is a sectional side elevation similar to Fig. 3 showing the transfer mechanism after being operated to transfer and pile a blank on top of those transferred in earlier operations. Fig. 5 is a sectional side elevation similar to those shown in Figs. 3 and 4, showing the piled blanks of Figs. 4 in the next step of the transfer operation; Fig. 6 is a sectional side elevation showing the piled blanks of Figs. 4 and 5 at the end of their transverse movement on the hot bed and in position to be moved longitudinally from the hot bed to the shear or other place of disposal. Fig. 7 is a plan, and Fig. 8 a sectional end elevation on the line VIII—VIII of Fig. 7, on a larger scale, showing a detail of one of the sliding frames and its tilting dogs and the ways or supports for the frame. Fig. 9 is a sectional detail of the angle plates in which the pins or stops 29 are adjustably secured.

My invention relates to apparatus used in handling materials manufactured in a rolling mill, and it more particularly relates to such apparatus used in handling long, thin pipe skelp bars, plates and similar flexible materials rolled in such mills while they are being cooled on the hot bed from the comparatively high temperatures, at which they reach the hot beds after the completion of the rolling operation.

The object of my invention is to provide an improved transfer mechanism by which such rolled materials are transferred sidewise out of the path of materials delivered from the bullhead rolls of the rolling mill.

Another object of the invention is to provide means for transferring and piling the materials on the hot bed.

A further object of the invention is to provide an improved transfer mechanism by which materials are transferred sidewise out of the path of other materials being delivered from the rolling mill, are piled, and the piled materials are transferred as a unit sidewise into position to be removed longitudinally from the hot bed.

A still further object of my invention is to provide improved transfer mechanism by the use of which the materials may be transferred sidewise to either or both of the opposite sides of the central runway located in the middle of the width of such hot bed.

In the drawings, 2 represents the central runway of a hot bed on which materials are delivered from the rolls of the rolling mill; and 3, 4 are hot beds located on opposite sides of the runway 2 to which the materials are transferred and on which they are supported while being cooled. On the outer sides of the hot beds 4 are runways 5 and 6, on which the materials are finally transferred and are moved longitudinally from the hot bed.

When thin, flexible materials are to be handled by the apparatus forming my invention, roller tables are not necessarily used in the construction of the runways, the pinch rollers 7 and 8 being employed in their stead.

The top surface of the hot bed is provided with a series of transverse recesses 9, in which the sliding frames 10, 11 are movably mounted. The outer ends of the slides 10 and 11 are connected by links 12 and 13 to the outer end of the swinging arms 14 and 15 by which they are actuated. The arms 14 and 15 are secured on the rocking shafts 16 and 17, these shafts being mounted in suitable bearings 18. Also secured on the shafts 16 and 17 are spur pinions 19, the teeth of which mesh with the teeth in the racks 20 and 21, forming part of the piston which extends into the ends of the single acting fluid pressure cylinders 22, 22ª, 23, 23ª.

Each of the series of sliding frames 10 and 11 is provided with a pivoted dog 24,

by which materials are pushed from the central runway 2 to the hot beds 3 or 4. Also mounted on the sliding frames 10 and 11 is a pivoted stop 25, which is arranged so as to limit the movement of the materials pushed from the central runway 2. The stop 25 is removably secured in one of a series of pairs of slotted openings 26 provided in each of the sliding frames so as to permit of the stops 25 being adjusted to accommodate different widths of materials rolled in such mills. In addition to the dog 24 on each of the sliding frames is a second dog 27, by which the materials are pulled from their position on the hot bed to the runway 5 or 6 of the hot bed. The dog 27 is arranged to tilt in one direction only, tilting in the opposite direction being prevented by the pin or stop 27^a, forming part of the sliding frame. Intermediate of the dogs 24 and 27, on each of the sliding frames, is a similar dog 28, which also is arranged to tilt freely in one direction, and is prevented by a pin 28^a from tilting in the opposite direction, this dog being employed to transfer materials on the beds 3 and 4 from the position in which they are pushed in the first operation by the dogs 24 into position to be pulled from the hot bed to the runway 5 or 6 by the dog 27.

The stops 25 on each of the sliding frames 10 or 11 are arranged to limit the movement of materials pushed from the central runway 2 by the dogs 24 located on the frames on the opposite side of the runway 2. The stops 25 are pivoted so as to swing freely in either direction except when the sliding frame is moved forwardly to the end of its forward movement. When in this position the lower or tail ends 25′ of the stops 25 will engage with the adjustable stops 29 mounted in openings 29^b in the angle plates 29^a secured on the support for the central runway 2, the stops 29 being removably secured in one of the series of holes 29^b which hold the stops in the proper location to correspond with the position of the stop 25 in its adjustable slots 26 on the sliding frame.

The dogs 24 are arranged to swing in opposite directions except when in certain positions relative to the central runway 2. When the sliding frames are actuated to move the dogs 24 into contact with materials on the central runway 2 so as to push such materials to the hot bed on the opposite side of the runway to that on which the sliding frame and its operating mechanism is located, the bottom portion 24′ of the dog 24 engages with the central dog supporting member 30 located below the top surface of the central runway 2 in the bottom of each recess in the hot beds. When the dogs 24 on the slides are moved beyond this central portion 30 the dog is free to swing.

In the operation of my improved apparatus, a rolled blank is delivered from the rolls to the central runway 2, as is shown in Fig. 2. One of the rocking shafts 16 or 17 is then actuated to move the sliding frames connected to the shaft. As the dogs 24 on these frames approach the central runway 2, the bottom portions 24′ engage with the support 30, and when the dog contacts with the skelp upon the central runway, by continuing the forward movement of the sliding frames the dog contacts with and pushes this bar from the runway 2 onto the hot bed. When the sliding frames on one side of the central runway are being employed to push a bar forward, the sliding frames on the opposite side of the runway are moved forwardly into the position shown by the sliding frame on the right-hand of Fig. 3. In this position the tilting stop 25 by engagement of its lower end with the pin 29 is prevented from tilting and causes the movement of the blank to be stopped at a certain predetermined position. The sliding frames on the left-hand side of the drawing are then reciprocated to bring them back into the position shown in Figs. 2 and 3. When another blank is delivered on the central runway 2 the sliding frames on the left of the central runway 2 are again advanced when the dogs 24 will again push this blank against the stop 25.

It will be noted that the surface of the hot beds 3 and 4 is slightly lower than that of the marginal edges of the central runway 2, in this way permitting the bars being pushed to be piled on top of any bars which have already been moved against the stops 25. When a certain predetermined number of bars have been piled in this manner, generally three, the shaft 17 is moved to bring the swinging arms 15 and the sliding frames 11 from the position shown in Figs. 3 and 4 into that shown by Figs. 2, 5 and 6. By this movement, the pile of three bars is moved from the position shown in Fig. 4 into that shown in Fig. 5. By again advancing the sliding frames 11 into the position shown by Figs. 3 and 4, and then retracing them into the position shown by Figs. 2, 5 and 6, the bars are moved by the outer set of pivoted dogs 27 from the position of the bars shown in Fig. 5 to that shown in Fig. 6 of the runway by which the bars are delivered longitudinally from the hot bed. The same operations are carried out in transferring bars to the left-hand side of the central runway. It will be noted that in removing the bars from the central runway they are pushed by the dogs on the sliding frames located on one side of the central runway to a predetermined position on the hot bed on the opposite side of the central runway, and that in the subsequent operations they are moved step by step across the width of the hot bed by the dogs on the

sliding frames pulling them, in this case the bars being moved by the dogs on the same side of the central runway as that on which the bars being moved are located.

The advantages of my invention will be apparent to those skilled in the art. The apparatus is simple and is easily kept in repair. By its use, flat thin bars, skelp and similar materials are easily and quickly handled in removing them out of the path of new materials being delivered by the rolling mill to the central runway of the hot bed. The materials are automatically piled during their transfer across the width of the hot bed, and the piled materials are moved as a unit from the position in which they are piled to the position on the runway on which they are removed from the hot bed. The step by step movement of the materials, together with the piling operation very greatly increases the capacity of the hot bed, as more materials can be stocked on the hot bed than where they are not arranged in piles.

Modifications in the construction and arrangement of the apparatus may of course be made within the scope of the claims without departing from the spirit of the invention. For instance, a number of pivoted dogs on the sliding frames may be varied, and the mechanism for shifting the slides may be changed, as I do not wish to be understood as limiting myself to the precise number of dogs shown nor to the specific mechanism for shifting the slides.

I claim:—

1. In a transfer mechanism for hot beds and similar apparatus, a pair of slides working in substantial parallelism, means on each slide for engaging a work-piece and moving the same by the movement of the slide, and a stop on one of the slides for engagement by a work-piece which is being moved by the other slide; substantially as described.

2. In a transfer device for hot beds and similar apparatus, a sliding frame movable transversely across the hot bed having a pivoted dog arranged to contact with and push materials on said hot bed, a second sliding frame having a pivoted dog adapted to contact with and pull materials lying on the hot bed, a stop on the second frame against which materials are pushed by the first frame, and means for actuating said frames, said second frame being arranged to move the materials from the position into which they are pushed by the dog on the first frame; substantially as described.

3. In a transfer device for hot beds and similar apparatus, a sliding frame movable transversely across the hot bed having a pivoted dog arranged to contact with and push materials on said hot bed, a second sliding frame having a pivoted dog adapted to contact with and pull materials lying on the hot bed, means at one side of the hot bed for actuating one sliding frame, and means in the other side of the hot bed for actuating the second sliding frame, said second frame being arranged to move the materials from the position into which they are pushed by the dog of the first frame; substantially as described.

4. The combination of a hot bed, a runway, a pair of reciprocatory slides working transversely across the runway and the hot bed from opposite sides of the runway, means on one slide for engaging the work-piece and removing the same from the runway to the hot bed, and means on the other slide for engaging the work-piece and moving it into a new position on the hot bed, substantially as described.

In testimony whereof, I have hereunto set my hand.

JAS. SIMPSON.

Witnesses:
JAS P. DAVIS,
RALPH E. PORTER.