Feb. 25, 1930. C. H. HUNT 1,748,226

PILER FOR ROLLED METAL

Filed Jan. 31, 1928 3 Sheets-Sheet 1

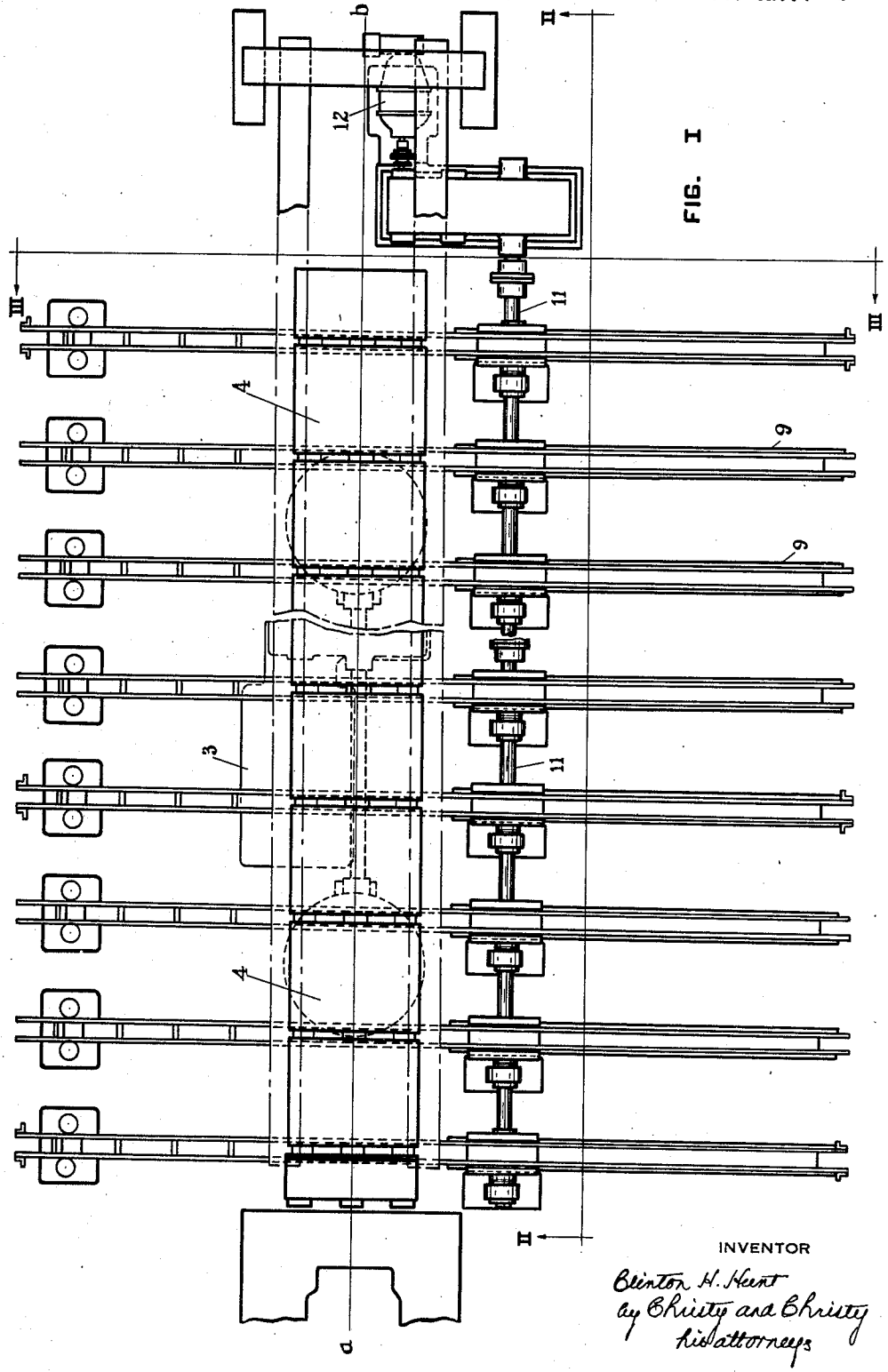


FIG. 1

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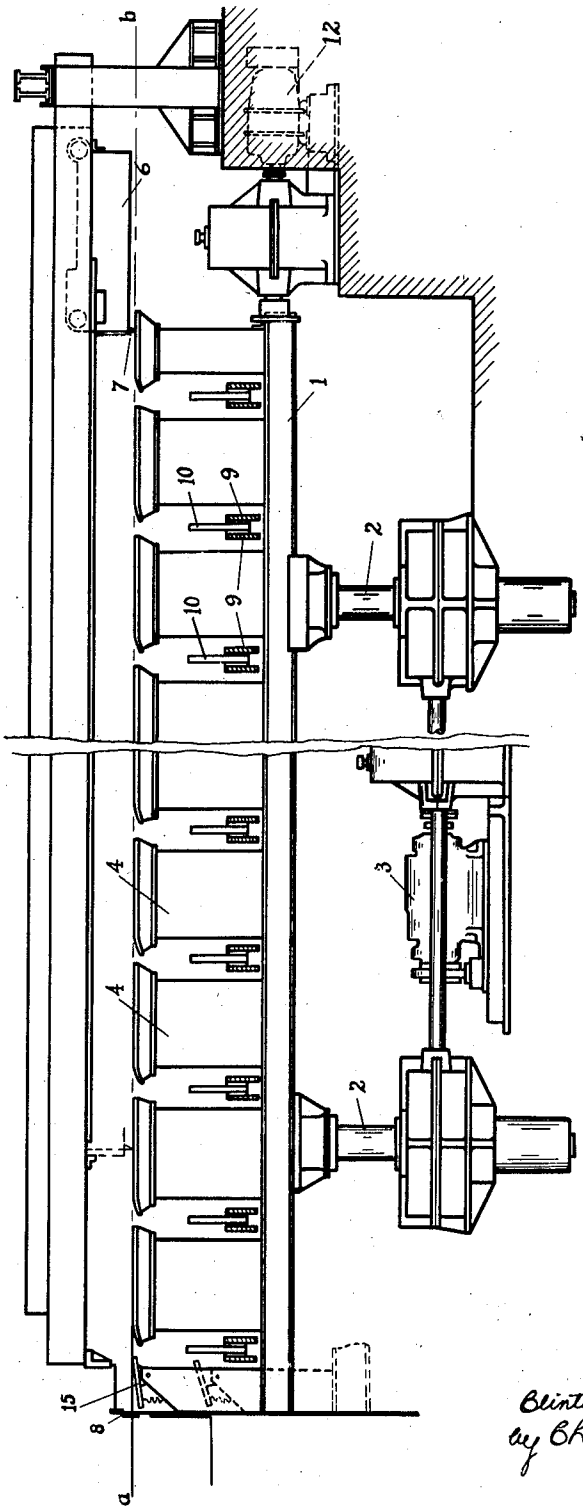


FIG. II

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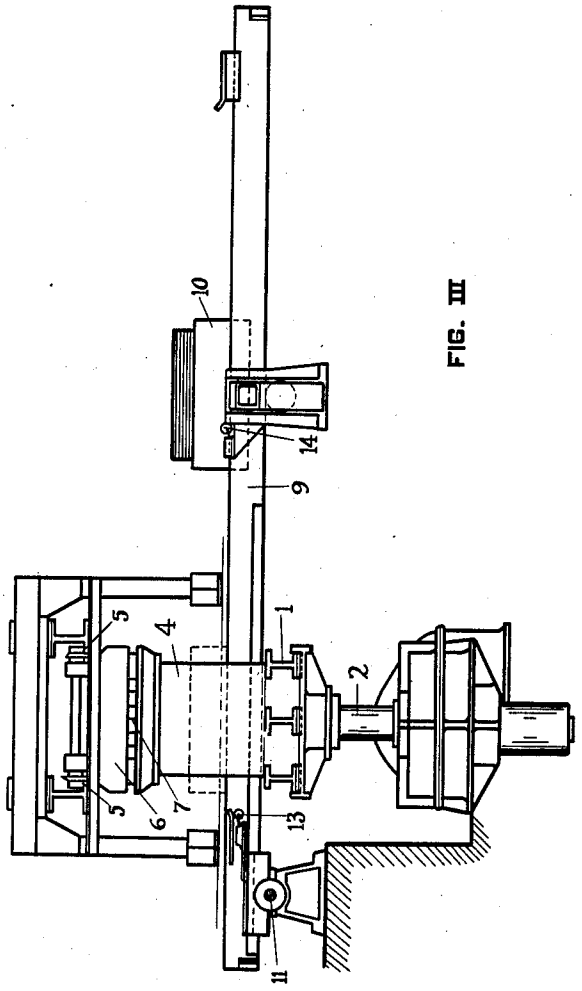


FIG. III

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Patented Feb. 25, 1930 1,748,226

UNITED STATES PATENT OFFICE

CLINTON H. HUNT, OF STEUBENVILLE, OHIO, ASSIGNOR TO WEIRTON STEEL COMPANY, OF WEIRTON, WEST VIRGINIA, A CORPORATION OF DELAWARE

PILER FOR ROLLED METAL

Application filed January 31, 1928. Serial No. 250,811.

My invention relates to rolling mill equipment and consists in a piler and accessory devices, for the handling of material as it comes from the rolling mill. I have developed my invention in association with a hot mill for rolling steel strip, and in that association I shall show and describe it. The truth will be understood, however, that the invention is of general applicability, wherever metal in sheet form is to be piled as it is produced, preparatory to further disposition of it.

In the accompanying drawings Fig. I is a view in plan from above of a piler embodying my invention; Fig. II is a view in vertical section, on the plane indicated at II—II, Fig. I; Fig. III is a view in vertical section, on the plane indicated at III—III, Fig. I. From Fig. I a certain carriage is, for clearness of illustration in other respects, omitted.

A platform 1, conveniently formed of beams, as shown, and of rectangular shape is borne in horizontal position upon a plurality of vertically standing screws 2, and the screws are provided with means, such as the motor 3, for turning them in unison, to the end that the platform may be raised and lowered, while maintained always in its essential horizontal position. Upon the platform are fixed standards 4 arranged in linear succession and spaced apart, so as to afford a succession of supporting surfaces interrupted by a succession of intervals which intervals extend transversely to the length of the structure. The upper supporting surfaces of the standards extend in a common horizontal plane.

This elevator structure is set with its vertical mid-plane coincident with the line of feed of the material to be piled, in this case the line in which rolled strip advances from the hot mill. Such line of feed is indicated at *a*—*b* in Figs. I and II.

Above and on either side of and extending in parallelism to the elevator structure extend rails 5, on which moves a carriage 6. This carriage is equipped with a stop or gauge 7 depending across the pathway of advance of material along the line of feed *a*—*b*. By shifting the carriage along its rails the stop may be set at any desired interval from the shears.

The shears are indicated at 8. The blades extend transversely across the path of advance of the material, and at the receiving end of the elevator structure.

In the intervals between the standards 4, transversely extending bars 9 are arranged. These bars are equipped with load-bearing blocks 10. The relative positions are such that within the range of descent of the elevator structure from superior position, the load extending longitudinally and resting upon a succession of the standards 4 will be transferred from standards 4 and will rest upon blocks 10. The bars 9 are movable in the direction of their length, and transversely with respect to the line of advance of the material. Suitable means are provided for moving bars 9, as for example, by forming the bars 9 beneath as toothed racks, and causing them to rest upon and make intermeshed engagement with pinions borne on a shaft 11. The shaft may be rotated in one direction and the other by a motor 12, to cause the bars 9 to move in unison, in one direction or the other, alternately. Limit switches 13, 14 may be provided, determining the range of travel of the bars 9 in their travel first in one direction and then in the other. The limit switches of course govern the energizing of the motor.

Fig. III shows one of the bars 9 with its load-bearing block 10 in position ready for the removal of the load. In dotted lines the alternative position is indicated,—the position of the block when it receives its load from the standards 4.

At the point of approach of the material along the line *a*—*b* to the elevator apparatus and beyond shears 8, is set a spring backed guide plate 15.

When the apparatus is set and ready to receive material, the elevator apparatus is in position, with the plane of the upper surfaces of the standards 4 coincident with, or substantially coincident with, the plane of advance of the material along its line of feed from the mill, and with the bars 9 at the left-hand end of their traverse, as seen in Fig.

III, and the blocks 10 in the spaces between standards 4. The stop or gauge 7 is by the shifting of the carriage 6 set at the desired distance from the shears 8. Material is then caused to advance from left to right as seen in Fig. II, guided by plate 15, and over the surfaces of standards 4, until the forward end of the strip abuts upon stop or gauge 7. Such abutment may be the indication to the operator, when to bring the material to rest. Thereupon, by the action of the operator, the shears 8 may be operated to sever a length of material from the strip of indefinite length.

Following upon the operation of the shears, the motor 3 is energized and the screws 2 turned through a predetermined interval and then stopped, giving to the elevator apparatus a downward movement through an interval as great as and preferably equal to the thickness of the material and no more. The operations thus far described are repeated, until the material on hand is piled, or until the pile is of desired height. Further descent of the elevating apparatus will then leave the accumulated pile of material, resting upon blocks 10, while standards 4, having moved to lower level, are unburdened and out of the way. The bars 9 are then by the energizing of motor 12 shifted in the direction of their length and transversely of the line in which the material has in piling progressed, and the pile is brought to the position shown in Fig. III, where it is accessible for removal. When a pile so built and shifted has been removed, the bars 9 may be shifted again to initial position, and the cycle of operation described may be repeated.

A further advantage of the apparatus described is that when a pile of rolled metal has been completed at the shear and lowered on to the load bearing blocks 10, and has been moved out from under the gauge (as shown in full lines, Fig. III) the platform carrying the fixed standards 4 may be elevated to active position and shearing and piling may proceed, before it is necessary to remove the pile of rolled material from the load bearing blocks 10. Thus considerable time is allowed for the overhead crane or other mechanism for taking the material away to do its work, without holding up operations.

The piling apparatus is adapted to handle rolled metal attenuated in horizontal plane, whether in the form known to the industry as sheet or plate or strip, or otherwise designated; and in structure it is requisite only that those features be retained in which the invention as I am about to define it resides. Details may be varied as the engineer may wish.

I claim as my invention:

1. In metal-piling apparatus an elevator structure including a plurality of standards spaced apart and having their upper surfaces extending in a common horizontal plane and movable vertically as a unit downward from a position in which their upper surfaces coincide with a line of feed of material to be piled, means for causing the standards to descend from the position of such coincidence, and a bar arranged in the space between two of the said standards and having a material-supporting surface disposed in a plane lower than the said line of feed and adapted to receive the load of the descending standards, such bar being reciprocable laterally.

2. In metal-piling apparatus an elevator structure including a plurality of standards spaced in succession in the direction of the advance of material, the upper surfaces of such standards extending in a common horizontal plane, a plurality of vertically arranged screws sustaining said standards, and means for turning said screws in unison, a plurality of parallel bars extending transversely between said standards and reciprocable in unison in the direction of their length, the said bars being adapted to receive a load from the descending standards.

In testimony whereof I have hereunto set my hand.

CLINTON H. HUNT.