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MACHINE FOR RECEIVING AND CONVEYING INTO AND OUT OF THE PICKLING TANKS, PILES OF SHEET BILLETS, SEMIFINISHED ROLLED PRODUCTS, SHEETS, AND OTHER MATERIAL TO BE PICKLED

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Fig. 4

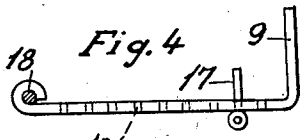


Fig. 1

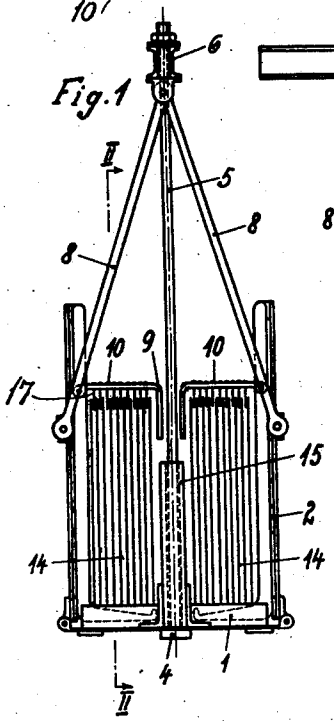


Fig. 2

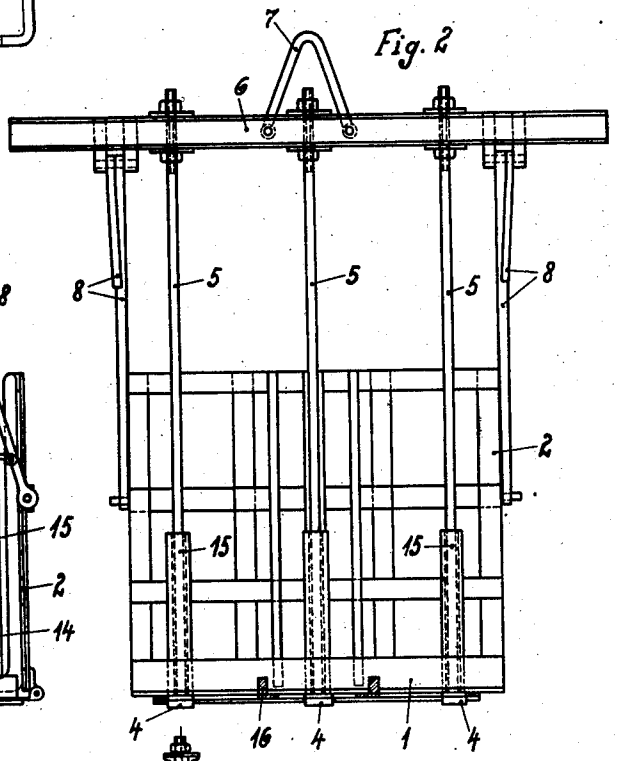


Fig. 3

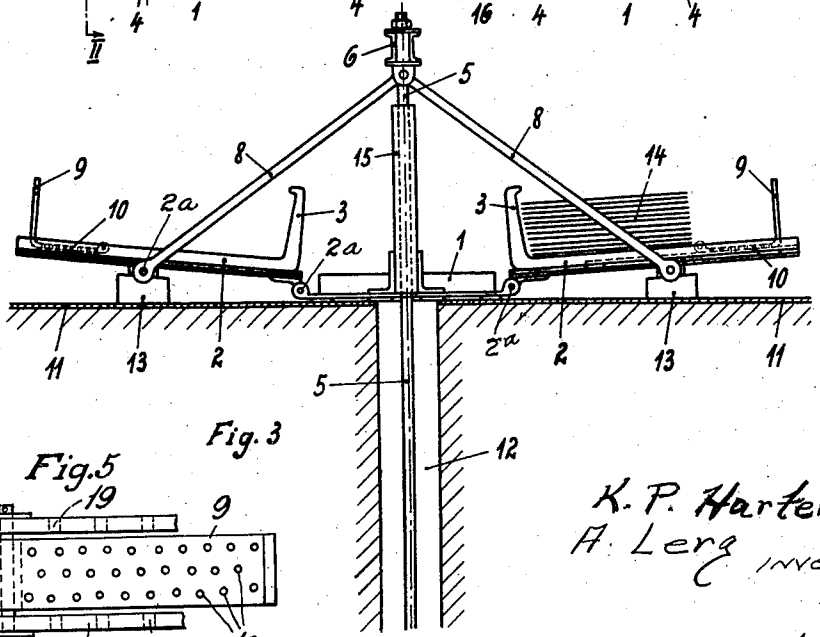


Fig. 5

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MACHINE FOR RECEIVING AND CONVEYING INTO AND OUT OF THE PICKLING TANKS, PILES OF SHEET BILLETS, SEMI-FINISHED ROLLED PRODUCTS, SHEETS, AND OTHER MATERIAL TO BE PICKLED

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3 Claims. (Cl. 266—7)

This invention relates to a machine for receiving and conveying into and out of the pickling tanks, piles of sheet billets, semi-finished rolled products, sheets and other material to be pickled.

In the production of thin metal sheets, for example, such as are employed for building motor car bodies, the plates used for rolling into thin sheets the semi-finished products rolled from these plates, and the sheets must be subjected to a pickling treatment once or several times during the rolling operation, in order to obtain the desired quality of sheeting. The plates semi-finished material or sheets to be pickled are introduced into the pickling tank by bringing the material to be pickled into vertical position on a conveying device by which the material is then lowered into the pickling tank. It is necessary to place the material to be pickled in vertical position on the conveying device so that the individual sheet billets, semi-finished products or sheets separate slightly and spaces form between the individual pieces, which spaces enable the pickling liquor to flush the material on all sides.

Hitherto the piles of sheet billets, semifinished rolled material or sheets were stood on edge on the conveying device, by taking the sheet billets, semi-finished rolled material or sheets singly, or in the case of small material in pairs, from a pile by hand or by hand operated tongs and standing them on the conveying device, whereupon they were removed from the conveying device after the pickling, washing and drying singly or in pairs by hand or by hand operated tongs. It is evident that the standing and removing of the sheet billets, semi-finished rolled products or sheets singly and in the manner described is very inconvenient and takes a considerable time, quite apart from the fact that it means heavy and tiring work for the man carrying out this work.

The present invention relates to a device for receiving and conveying in piles sheet billets, semi-finished rolled products or sheets into and out of the pickling tanks, in which the above mentioned disadvantage is overcome by constructing in the form of a cage the conveying device accommodating the sheet billets semi-finished rolled products or sheets to be pickled, so that the piles of material are placed directly on the conveying device by a crane and automatically assume an upright position when the device is lifted, thereby doing away with all additional inserting work. This is attained by supporting elements destined to receive the piles, and hingedly mounted one on each side of a middle element influenced by a pull rod, said supporting elements being connected with and actuated by the crane by means of a rod system in such a manner that, when the device is raised by means of the crane, the supporting elements carrying the pile are swung upwards and the material resting thereon in the form of a pile is brought into upright position and, after the pickling, washing and drying, returned into its horizontal position during the setting down of the device, the individual plates resting one on the other in the form of a pile, so that they can be removed from the device after the crane chains have been placed around the pile.

An embodiment of the invention is illustrated, by way of example, in the accompanying drawing in which:

Fig. 1 shows in end view the device in closed condition the sheet billets semi-finished rolled products or plates accommodated therein being in vertical position.

Fig. 2 is a side elevation partly in section on line II—II of Fig. 1; the parts 1 and 9 shown in Fig. 1 being omitted to facilitate illustration.

Fig. 3 is an end view showing the device in open condition, that is in the position in which the material to be pickled is placed thereon in the form of a pile.

Figs. 4 and 5 show respectively in side elevation and plan details of the angle pieces.

Referring to the drawing 1 designates the middle part of the device and 2 the supporting elements hingedly connected at 2a to said middle part. Each supporting element is provided with a ledge 3. Pull rods 5 having stops 4 at their lower ends extend through the middle part 1 and are secured to a cross girder 6 which carries the crane shakle 7. The pull rods 5 are rigidly connected to the girder 6 and are maintained in vertical position by the guide sleeves 15 which extend upwardly from the middle part 1. By means of rods 8 hingedly connected at one end to the oscillatable supporting elements 2 and at their other ends to the girder 6, the supporting elements 2 are swung upwards into closed position when the girder 6 is lifted by a crane and swing downwards into open position when the girder is lowered. Angle pieces 9 are hingedly and oscillatably mounted on the inner surfaces of the supporting elements 2 as shown at 18 in Fig. 5, and have bores 10 for accommodating spacer pins 17 (Fig. 4). These angle pieces automatically swing by gravity into the position shown in Fig. 1 when the supporting elements are swung into vertical position. In order to adjust the angle pieces so that they will fit over sheet material of various lengths

a plurality of aligned spaced apertures 19 (Fig. 5) are provided in the side walls of the supporting members 2 for receiving the hinge pin 18. Opening 12 in the foundation 11 serves for accommodating the pull rods 5 during the opening of the device after it has been placed on the foundation, whereas blocks 13 on the foundation 11 are designed to support the supporting elements in their open position.

The piles 14 of sheet billets, semi-finished rolled products or sheets are placed on the oscillatable supporting elements 2 and bear against the ledge 3 thereof, it being advisable to make the supporting elements 2 of sufficient width that they can be employed for all sizes of material to be pickled. When the crane chains (not shown) have been removed from the piles 14, the device is lifted by the crane, the supporting elements 2 being thereby positively swung upwards by the rods 8 thereby bringing into vertical position the sheet billets, semi-finished products or sheets bearing against the ledge 3. At the same time the angle pieces 9, which are adjustable on the supporting members 2 (Fig. 5) according to the size of the piles resting on the supporting elements 2, drop by gravity over the free end face of the piles 14 and if spacing pins are then fitted in the holes 10 in the angle pieces 9 the individual pieces of material may be held apart so that they are exposed to the pickling liquor on all sides. When the device has closed the stops 4 on the rods 5 come into contact with the middle part 1 through guides 15 in which the rods 5 slide freely, and when the girder is raised higher the closed device is lifted and conveyed to the pickling tank.

The pickled material is removed from the device in inverse operation, i. e. the device is lowered onto the foundation 11 by means of the crane and as the girder 6 sinks lower, the supporting elements 2 being positively connected with the girder 6 by the rods 8 swing downwards or open, and the rods 5 slide in the middle piece 1 and descend into the wall 12. The angle pieces 9 then assume the position shown in Fig. 3 and the spacer pins fitted in the bores 10 of the angle pieces 9 drop out.

In order to obtain greater durability, the device is made of washable acidproof material and its surfaces contacting with the sheet billets, semi-finished rolled products or sheets are fitted with a material which will not injure the plates, for example wooden bars 16 arranged on the ledge or on the inner surfaces of the supporting elements 2.

We claim:

1. A device for accommodating and conveying piles of sheet billets, semi-finished rolled products, sheets or other material to be pickled into and out of a pickling tank, comprising a middle part, pull rods guided in said middle part, a girder carrying said pull rods, supporting elements hingedly connected to the two sides of said middle part, adapted to receive the piles of material, ledges on said supporting elements, adapted to support the piles of material in vertical position connecting rods connecting said supporting elements with said girder and adapted, when said girder is lifted, to swing said supporting elements upwards into closed position and thereby bring the material resting thereon into upright position, and when said girder is lowered to guide said supporting elements downwards into open position and thereby return the material into its horizontal position resting on the supporting elements.

2. A device as specified in claim 1, comprising in combination with the supporting elements, oscillatable angle pieces hingedly and adjustably mounted on the inner sides of said supporting elements and thereby adapted to automatically swing by gravity into horizontal position and to engage over the edges of the piles when said supporting elements are swung upwards, each of said angle pieces having a plurality of offset holes, and spacing pin insertable in said holes and extending into the spaces between the sheets of the piles when the latter are swung into upright position.

3. A device as claimed in claim 1 comprising in combination with the supporting elements, oscillatable angle pieces hingedly and adjustably mounted on the inner sides of said supporting elements and thereby adapted to automatically swing by gravity into horizontal position and to engage over the edges of the piles when said supporting elements are swung upwards.

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