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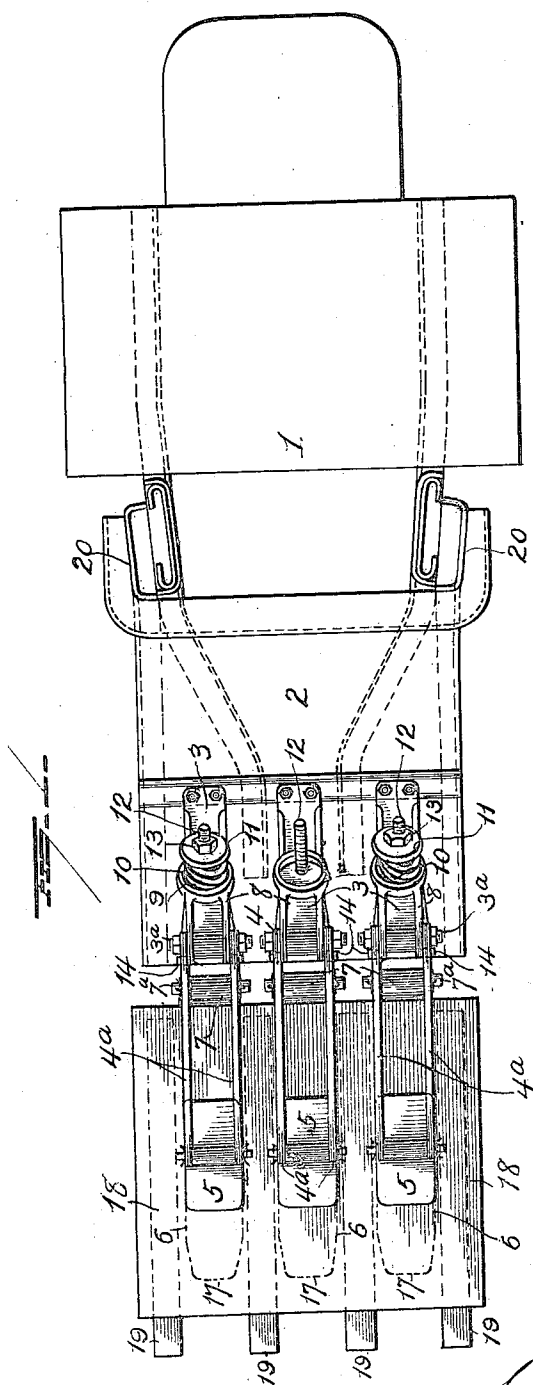
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C. S. SCHROEDER

HANDLING AND CONVEYING MEANS

Filed June 18, 1923

2 Sheets-Sheet 1



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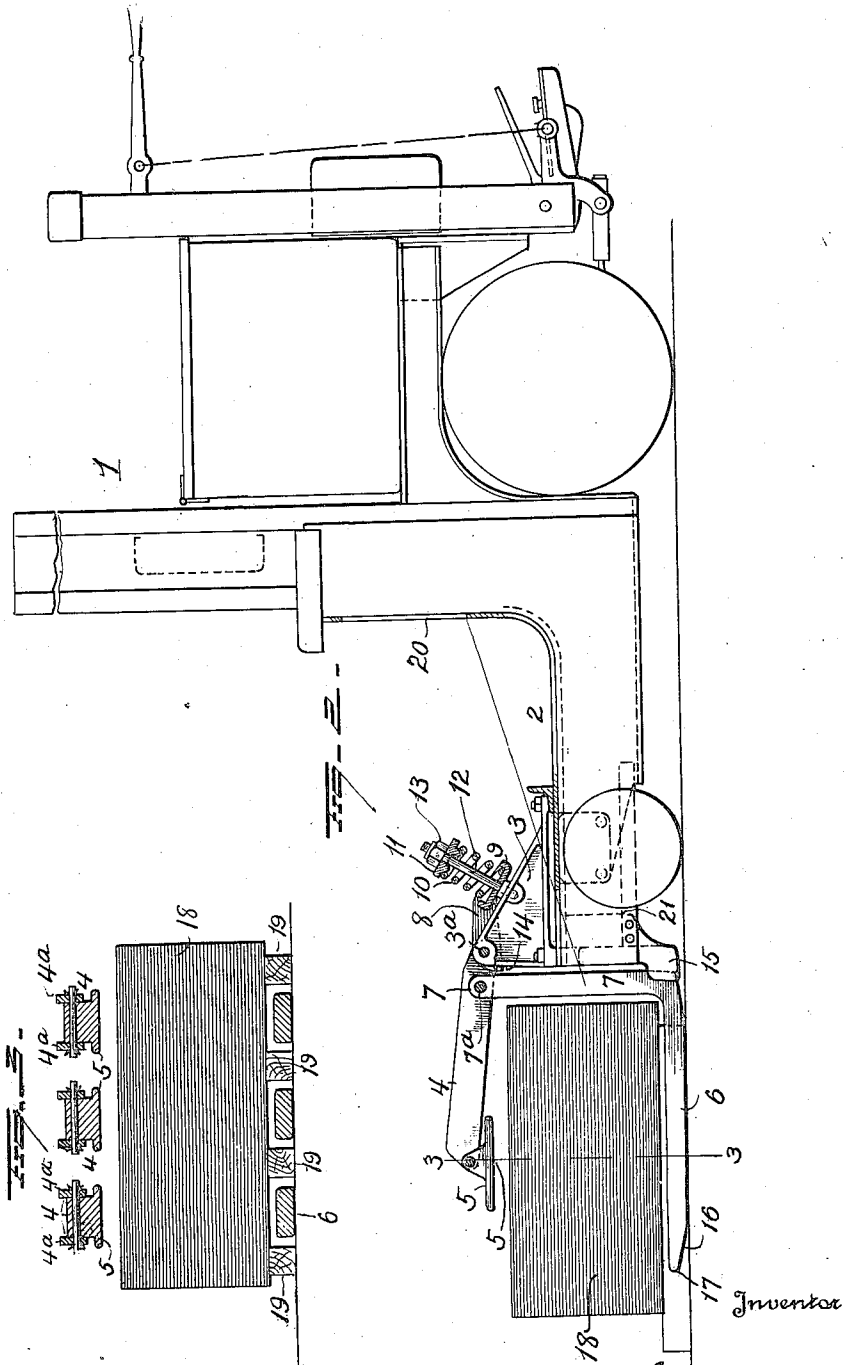
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# UNITED STATES PATENT OFFICE.

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## HANDLING AND CONVEYING MEANS.

Application filed June 13, 1923. Serial No. 846,081.

*To all whom it may concern:*

Be it known that I, CHARLES S. SCHROEDER, a citizen of the United States, and resident of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Handling and Conveying Means; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in handling and conveying means and more particularly for use in cooperation with elevator trucks such as may be employed in and about factories.

One object of the invention is to provide improved conveying means, including means which shall be operable to facilitate the picking up of the load and the clamping of the same to prevent slipping while the conveyor is running over rough pavement.

A further object is to so construct and arrange the picking-up and clamping mechanisms that they shall be cooperative in such manner that the weight of the load shall operate automatically to effect the clamping of the same, and so that the degree of clamping pressure shall be directly proportionate to the weight of the load.

A further object is to provide means for handling packages of varying thickness without requiring adjustment or manual operation.

With these and other objects in view, the invention consists in certain novel features as hereinafter set forth and pointed out in the claims.

In the accompanying drawings,—

Figure 1 is a plan view showing a vehicle of the "industrial truck" type and illustrating the application of my improvements thereto.

Figure 2 is a side elevation partly in section, and

Figure 3 is a transverse sectional view on the line 3—3 of Figure 2.

My improvements are intended more especially for use in handling thin sheet metal in bulk, and for moving the raw sheet stock through the various operations, and the construction and operation of the said improvements will be described in connection with the handling of sheet metal, although

it will be understood that the same are also well adapted for use in handling and conveying other material or articles.

In the drawings, I have shown an industrial truck 1 which may be of any desired construction so far as the general structure and controlling means are concerned, but which is provided with a rearwardly projecting elevator 2 and the latter may be operated and controlled by any suitable means, such for instance as shown and described in application for patent filed January 18, 1921 by Charles S. Schroeder and designated by Serial No. 438,084.

To the rear portion of the elevator platform of the truck a plurality of brackets 3 (preferably three) are rigidly but preferably removably secured,—such of said brackets having a general triangular shape. The forward end of a lever 4 is pivoted at 3<sup>a</sup> to the upper portion of each bracket 3 and projects rearwardly beyond the rear end of the elevator platform, each lever 4 having pivotally connected with its rear end a pendant clamping hand or pad 5. In the construction shown in the drawings, each lever 4 comprises two parallel members 4<sup>a</sup>—4<sup>b</sup> with the shank of the clamping head or pad 5 pivoted between their free end portions, but the levers 4 may be otherwise constructed, if desired.

A plurality of rearwardly extending horizontally-disposed forks or load supporting arms 6 are located rearwardly of the elevator platform and each is provided at its forward end with a vertical extension 7,—the upper end of which is pivotally connected at 7<sup>a</sup> with one of the levers 4, a comparatively short distance from the pivotal connection of said lever with bracket 3.

A short lever 8 is pivotally connected with each bracket 3, at 4<sup>a</sup>, and projects forwardly, the free end of said lever being provided with a cup 9 which forms a bearing for one end of a spring 10. The upper end of each spring 10 bears against a disk 11 which is held adjustably on a rod 12 by a nut 13, and said rod is secured to and projects in an inclined direction from the inclined portion of bracket 3 at a point approximately midway between the ends of the same. Each lever 8 is provided at its rear end rearwardly of the pivotal support of said lever, with lateral lugs 14 which en-

gage under the lever 4 near said pivotal support.

Each of the rearwardly projecting load supporting arms 6 has a sliding bearing at the bend or corner against a shoe or abutment 15 which depends below the rear portion of the elevator platform of the truck.

The springs 10 are sufficient normally to sustain the weight of the several load supporting arms or forks and attached parts.

Normally, the load supporting arms or forks are in close proximity to the floor and their rear ends may be beveled as at 16 and rounded as at 17.

It is customary to support stacks 18 of sheet metal upon two or four wooden blocks 19 suitably spaced apart and in the operation of my improvements, the truck will be so operated as to cause the load supporting arms or forks to pass between the spaced blocks and under the load or stack of metal to be handled. In order that the operator, standing on the operator's platform of the truck, may have clear vision of the load engaging devices and the load, an opening 20 may be made in the vertical portion of the elevator and another opening or openings 21 may be made in the rear end of the platform portion of the elevator.

When the truck shall have been positioned as indicated in Figure 2, with the load supporting arms 6 disposed under the load 18 and the clamping heads or pads 5 located above the load, the operator will cause the elevator to rise and the load to become supported on the arms or forks 6. When the arms or forks 6 contact with the heavy load due to the raising of the elevator platform, the force of the springs 10 will be counteracted by the weight of the load and the levers 4 will be caused to descend until the clamping heads or pads 5 contact with the load and clamp the latter firmly. The load supported on the arms or forks 6, will then rise with the elevator platform to any desired height within the limit of maximum travel of the elevator.

It may be here stated that, due to the leverage of the levers 4, the pressure developed by the clamping heads or pads 5 will be in proportion to the weight of the load times the lever ratio between the pivots 3<sup>a</sup> and 7<sup>a</sup> divided by the leverage between the pivot 3<sup>a</sup> and the heads or pads 5 at 5<sup>a</sup>. For example, if the load weighs 2500 pounds and the ratio of 3<sup>a</sup>, 7<sup>a</sup> to 3<sup>a</sup>, 5<sup>a</sup> is seven to one, the heads or pads 5 will exert a pressure of 357 pounds. This amount of pressure is sufficient to keep the load from slipping while in transit.

With my improvements, I am able to handle packages of varying thickness, within reasonable limits, without requiring adjustment or manual operation. It will also be noted that the pressure of the clamps will

be in proportion to the load carried, thus preventing undue strain on lighter or frailer materials and still have a sufficiently firm grip for the heavier ones.

It will also be noted that it is possible to carry the load at an angle with respect to the center line of the machine, thus making it possible to deposit a package that is narrower than the overall width of the machine square into the corner of a building or a box car.

Another important service that the machine may perform is to pile and pick from piles the packages in storage. The metal may be stored in packages about a foot high each, the first or lowest bundle being placed on stringers that are thicker than the forks. The next bundle will be placed on another set of stringers directly on top of the lowest. Packages will be piled in this way to a height of approximately four feet. When it is desired to take the material from storage, the truck platform will be elevated to bring the forks to such a height as will pass under the highest parcel. The machine is then run under, the platform elevated, and the material transported as desired. It is evident that in order to reliably and quickly gauge the height of the forks, and see that they will clear properly, it is necessary that the operator be able to see the tips of the forks from the driving position. I have made this possible by employing three fork units, as shown, and allowing a clear vision between them. The openings 20 and 21 in the elevator will facilitate such vision by the operator.

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

1. An attachment for a wheeled conveyor having elevating means, comprising a pivotally supported load supporting arm, means for connecting said arm with the elevator or conveyor, load clamping means over said arm, and means whereby the weight of the load on said arm will operate automatically to effect clamping of the load when the elevator is raised.

2. An attachment for a wheeled conveyor having elevating means, comprising a bracket adapted for attachment to said elevating means, a load supporting arm, a clamping member, and means cooperable with supporting arm, clamping means and bracket whereby the weight of the load will automatically operate said clamping means to engage the load proportionate to the weight of the latter when the conveyor elevating means to which said bracket may be attached is raised.

3. An attachment for a wheeled conveyor having elevating means, comprising a bracket adapted for attachment to said elevating means, a clamping lever pivoted

near one end to said bracket, a load supporting arm pivotally connected with said lever near the pivotal support of the latter, a short lever pivoted to said bracket and engaging under the first-mentioned lever near the pivotal support of the same, and a counterbalancing spring between the free end of said short lever and said bracket.

4. The combination with a wheeled conveyor and an elevator associated therewith, of a plurality of spaced brackets secured to the free end portion of the platform of said elevator, a clamping lever pivoted near one end to each bracket and provided with a load engaging member, a plurality of load supporting arms, upright members rigid with said arms and having pivotal connection with the clamping levers, and yielding means cooperable with the bracket and clamping levers and operable normally to sustain the weight of the load supporting arms.

5. The combination with a wheeled conveyor and an elevator associated therewith, of a plurality of spaced brackets secured to the end of the horizontal portion of said elevator, a clamping lever pivoted near one end to each bracket, a head or pad pivoted to the free end portion of each clamping

lever, a plurality of load supporting arms provided with upright members pivoted to the clamping levers near the pivotal supports of the latter, fixed abutments for said load-supporting arms, short levers pivoted to said brackets and engaging the clamping levers, and springs between said short levers and said brackets.

6. The combination with a truck and an elevator associated therewith, said elevator including an upright portion having a sight opening and a platform having a sight opening, of a plurality of spaced brackets secured to the platform portion of the elevator, clamping levers pivoted to said brackets, load supporting arms having upright members pivoted to said clamping levers, and yielding means associated with the brackets and clamping levers and operable normally to sustain the weight of the load supporting arms.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

CHARLES S. SCHROEDER.

Witnesses:

ELWOOD A. MERWIN,  
STEWART POORE.