

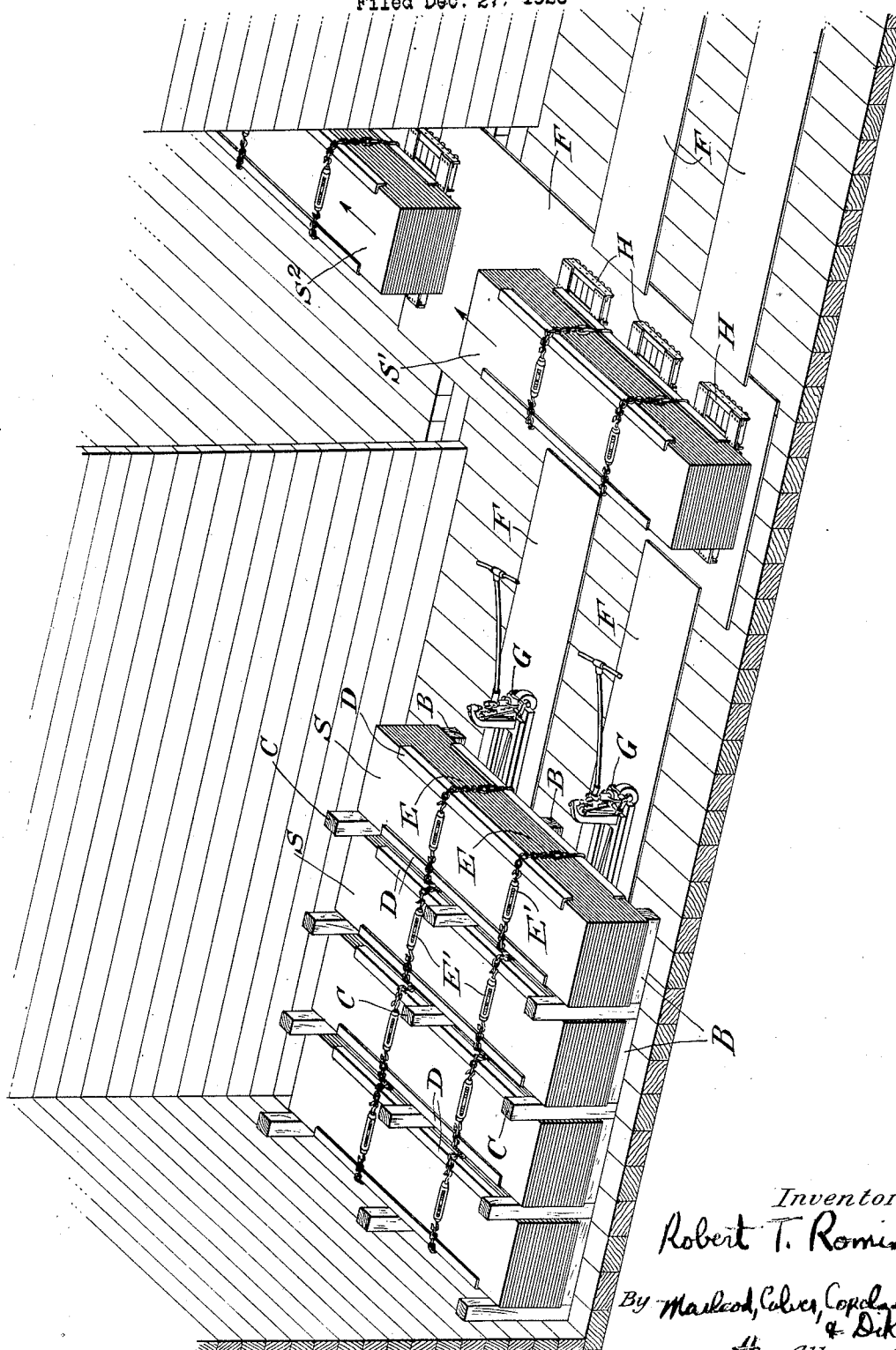
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METHOD OF HANDLING METAL

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UNITED STATES PATENT OFFICE.

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METHOD OF HANDLING METAL.

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This invention relates to a method of handling metal, an important purpose of the invention being to provide an improved method of packing metal, such as finished sheet steel, strip and bar stock, in relatively heavy units on the floor of a freight car whereby each unit pack may be removed bodily from the car at destination without necessitating the breaking up of the packs and the separate manual handling of the constituent parts.

A further object of the invention is to provide an improved method of unloading the metal from the freight car in relatively heavy units weighing a number of tons and incapable of being manually lifted. One of the features of the invention resides in the fact that the metal, such as sheet steel, is transported on the freight car floor in packs or bundles positioned crosswise of the car and braced to maintain the constituent parts against such relative movement in transit as would prevent removal as units at destination. A further feature is the fact that each pack is supported on the car floor to provide spaces directly beneath the pack for lifting means, whereby the pack may be lifted vertically and taken bodily from the car by transferring it to a conveying medium.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

The figure is a perspective view illustrating one manner in which the metal is arranged for shipment in packs on the car floor and also illustrating the method of loading or unloading the car.

Before explaining in detail the present invention, and the method or mode of operation embodied therein, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practised or carried out in various ways. Also it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation, and it is not intended to limit the invention beyond the terms of the several

claims hereto appended or the requirements of the prior art.

In accordance with the present preferred manner of practising the invention, a plurality of packs of metal, such as sheet steel, are positioned adjacent each end of the car, preferably transversely of the car where the length of the sheets or metal parts is less than the inside width of the car. Thus where the width of the freight car is ninety six inches, packs of less length may be positioned crosswise of the car, and where the sheets are longer than ninety six inches they will be arranged lengthwise of the car. The present method of arranging the packs or bundles with the sheets extending transversely of the car is particularly advantageous where relatively narrow sheets are to be shipped since a larger number of packs may be placed side by side and at the same time in units of three to five tons capable of being lifted from beneath by means of suitable lifting and conveying devices, of less capacity than necessary where the car is loaded in approximately ten ton units.

Frequently the freight cars are not loaded to their full capacity of forty or fifty tons, so that by loading the packs of sheet steel crosswise of the car, for example four packs at each end of the car, the weight of each pack may approximate three or four tons thereby adapting the pack to be lifted by means of smaller capacity standard type of lifting devices, such as hand operated jack-lifts, and moved bodily out of the car doorway.

The invention, therefore, enables the use of relatively simple mechanical units or devices conveniently operable within the relatively confined area of a loaded or partially loaded car. Each pack is supported on the floor of the car and preferably spaced therefrom, and as will be later described in detail, each pack has spaced points of support to provide free space or clearance therebeneath for the lifting and conveying means. In addition, the pack is so supported that the mechanism used for removing the pack is preferably of a character which may be supported at spaced points disposed on opposite sides of a vertical plane extending through the center of the pack. This mode of supporting the lift mechanism adjacent the pack, and in the same transverse plane of the car with the pack, distributes the load over the car floor and also insures

proper balancing of the pack and of the lifting mechanism during the lifting operation.

After the pack is lifted, it is transported through the car door or to the outside of the car preferably by transferring it to a second or other conveying medium than the lifting devices, such secondary or horizontal conveying medium being of some suitable form adapted to receive the pack raised by the lifting mechanism and from the latter. More specifically, as illustrated in the drawing, the pack is lifted from beneath by lifting means, such as a plurality of jacks and then moved rearwardly to a point opposite the car doorway. Thereupon a plurality of gravity roll devices may be inserted beneath the pack and the pack moved at right angles through the car doorway.

Thus, in carrying out the invention, I preferably provide mechanical units comprising a lifting mechanism to raise the pack above the floor and a secondary conveying means whereby the pack is carried through the car door, the pack being transferred in the present instance from the lifting mechanism to the conveying medium at a point opposite the car doorway.

Referring to the drawing the packs of metal S, sheet steel being illustrated in the present instance by the way of example, are arranged at each end of the car transversely thereto. The several packs or stacks S are supported on wood blocks B so as to provide suitable spaces or clearance between the bottom of the pack and the car floor, such as six inches in depth to permit the introduction of a lifting means beneath the pack at destination. It will be noted that these spaces are provided at opposite sides of the center of the pack. The packs may be braced apart by means of suitable buttresses C placed at opposite sides of each pack so as to prevent substantial relative movement of the sheets during transit. Additional bracing means may be provided as deemed necessary to cause the pack to be maintained substantially or sufficiently intact during transit so as to permit unit unloading at destination. In the present instance I prefer to provide binding elements on each pack so as to assist in maintaining the packs together as a unit against such displacement or relative movement in transit as would prevent removal of the packs as units at destination. These binding or bracing elements may comprise four horizontal angle bars D confining the longitudinal corners of the pack at the upper and lower longitudinal corners thereof. These angle members are clamped or bound on the bundle, in the present instance by means of flexible cable and chain devices E encircling the pack and tightened by means of turnbuckles E'. The binding or bracing elements D and E may be substantially the

same as described in my copending application Serial No. 104,909, filed April 27, 1926, or other suitable devices for accomplishing this purpose may be provided, such as shown in my copending application Serial No. 137,867, filed September 27, 1926.

In the embodiment shown in Fig. 1 I have shown each pack supported upon three longitudinal blocks B, one beneath the center of the pack and two thereof at opposite ends. If desired, additional spacing blocks may be provided for supporting the pack. The longitudinal angles D provide rigid supporting trusses for the pack, and particularly in the case of sheet metal act to resist bowing or bending of the pack between its points of support which might interfere with the insertion of the lifting devices beneath the pack.

In unloading the metal at destination a pair of jacklift devices G having the usual low mounted lift frames or platforms are introduced successively beneath the packs S in the spaces beneath the pack at opposite sides of the transverse vertical center plane thereof. Any suitable jacklift or lifting device may be used for this purpose having the desired height of lift platform capable of being introduced in the clearance spaces beneath the pack, and in the present instance a standard type Lewis-Shepard jacklift with a clearance preferably not greater than six inches is shown by way of example. The wheels of the jacklifts may have a bearing upon steel plates F laid on the car floor and by manipulating the operating handles the pack is lifted vertically to clear the supporting blocks B. Thereupon the workmen grasp the operating handles of the jacklifts G and move the bundle rearwardly to a point opposite the car doorway, as shown at S' in the drawing. Thereupon the pack is transferred to a secondary conveying means which in the present instance is in the form of a plurality of low platforms H mounted on antifriction or gravity rolls. The gravity roll devices H, three being shown in the present instance, are inserted in the clearance spaces beneath the pack at opposite sides of the jacklifts G. The roller devices are of such height as to permit the pack to be moved directly over them when positioned as shown in the drawing, spaces being provided between the roller devices H to receive the devices G. The lift platforms of the latter are then lowered so as to deposit the pack on the devices H. The jacklifts are removed from beneath the pack and the latter is then propelled directly through the car door as shown at S² in Fig. 1.

It will be seen that by virtue of this method it is not necessary in conveying the pack from the end of the car through the car doorway to turn or swing the pack, nor does it require a lifting or conveying medium pro-

vided with steering wheels, an important advantage, therefore, in the case where it is desired to use certain types of hand operated mechanical units in handling the heavy packs of metal.

After the pack is conveyed through or part way through the car doorway it may be hoisted by means of an overhead crane and transported to a suitable storage point, the mechanism of the crane being hooked into the four eye links at opposite sides of the pack forming part of the binding devices E.

In loading the freight car for shipment the same apparatus as above described may be employed, it being understood that the steps of the method would in such case be merely reversed.

It will be noted that the upward thrust of the lifting devices G or J will be taken by the angle iron truss members D, which not only prevent sagging or bowing of the pack but also prevent damage to the highly finished metal sheets. These angles also render the pack rigid against bending when lifted by means of a crane hooked into the four eye links of the binder elements E. In addition these angle members enable the binding elements to be tightened against the pack without damaging the corners thereof and assist in resisting tendency of the sheets to slide when the car is subjected to shocks.

What I claim is:

1. The hereindescribed method of unloading metal, such as sheet metal, arranged in packs one in front of another adjacent the end of the car with the packs extending transversely of the car, which consists in supporting lifting means beneath the pack at opposite sides of the transverse centre of the pack, lifting the pack and conveying it sidewise through the medium of said lifting means to a point opposite the car doorway, transferring the pack to a second conveying medium positioned on the car floor opposite the car doorway, and then moving the pack endwise through the car doorway.

2. The hereindescribed method of loading metal, such as sheet metal, in a freight car which consists in moving the pack endwise through the car doorway into the car by means of a conveying medium positioned on the car floor, transferring the pack at a point opposite the car doorway to a second conveying medium supporting the pack at opposite sides of the transverse centre thereof, moving the pack sidewise and in a direction

longitudinally of the car, lowering the pack by means of said second conveying medium to a point adjacent an end of the car and supporting the pack on the car floor for transportation with the pack extending transversely of the car.

3. The hereindescribed method of unloading metal, such as sheet metal, previously shipped in a freight car in packs positioned one in front of another adjacent the end of the car and supported during shipment on spaced members interposed between the pack and the car floor, which consists in inserting lifting devices beneath the pack in the spaces between said supporting members, lifting the pack from said members and moving it on said devices longitudinally of the car to a point opposite the car doorway, lowering the pack and transferring it to conveying devices positioned on the car floor opposite the car doorway, and moving the pack on said conveying devices transversely of the car through the car doorway.

4. The hereindescribed method of shipping and handling metal, such as sheet metal, which consists in transporting the packs of metal one in front of another adjacent the end of a freight car, supporting lifting devices beneath the pack at opposite sides of the center of the pack, lifting the pack through the medium of said devices and conveying it longitudinally of the car to a point opposite the car doorway, transferring the pack to a conveying medium positioned on the car floor opposite the car doorway, and then moving the pack on said conveying medium transversely of the car through the car doorway.

5. The hereindescribed method of unloading metal, such as sheet metal, transported in packs one in front of another adjacent the end of a freight car, which consists in supporting lifting devices beneath the pack at opposite sides of the center of the pack, lifting the pack through the medium of said devices and conveying it longitudinally of the car to a point opposite the car doorway, transferring the pack to a plurality of roller devices positioned on the car floor with spaces therebetween to receive said lifting devices, and moving the pack and said roller devices transversely of the car through the car doorway.

In testimony whereof I affix my signature.

ROBERT T. ROMINE.