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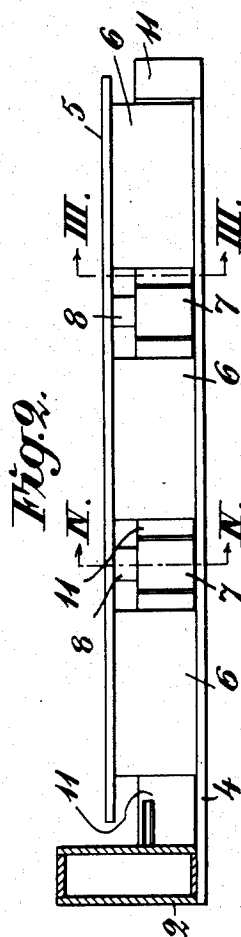
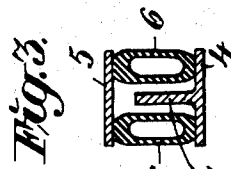
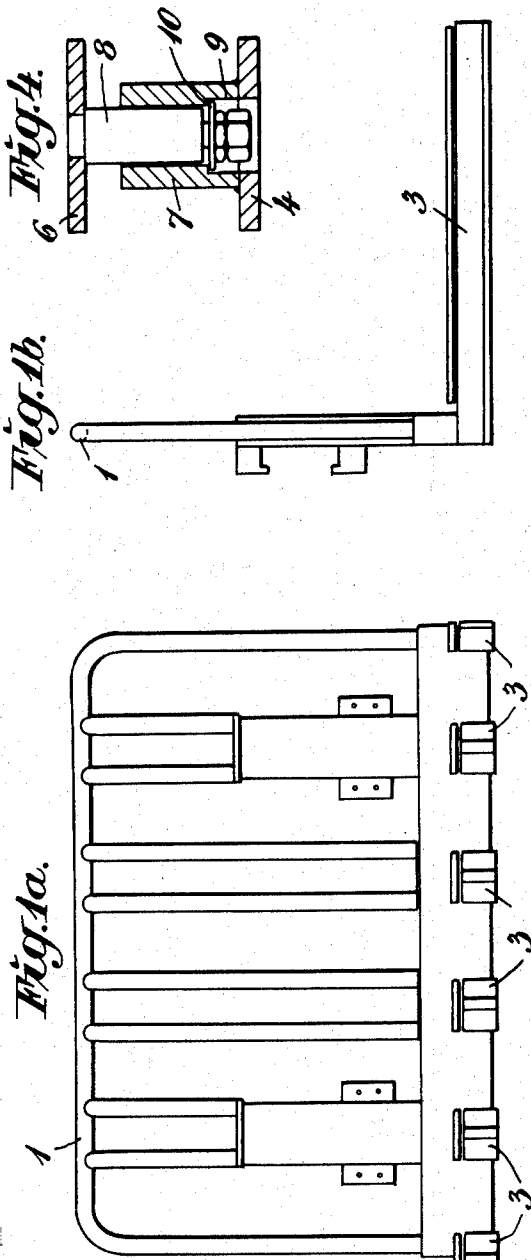
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2,656,943

FORK FOR ELEVATING TRUCKS

Filed March 13, 1950

3 Sheets-Sheet 1



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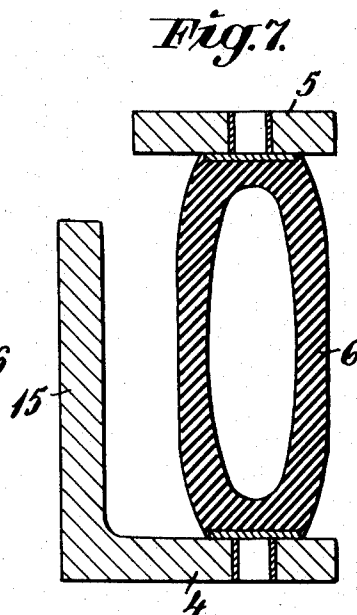
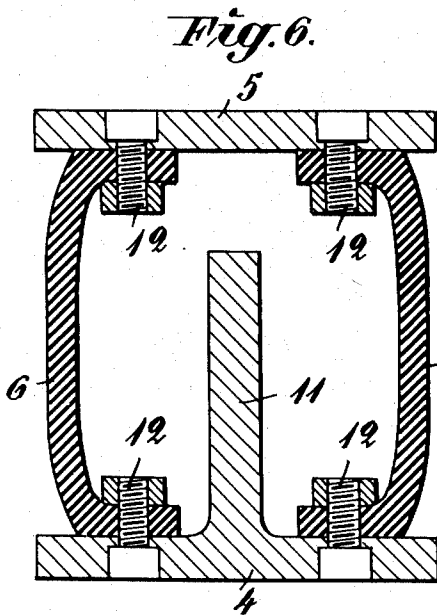
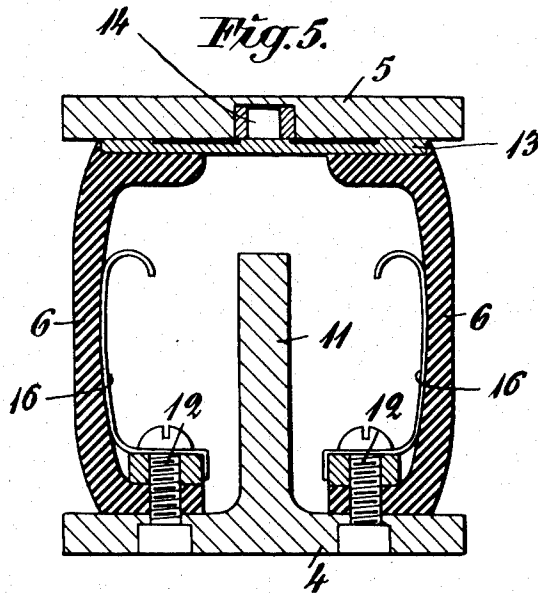
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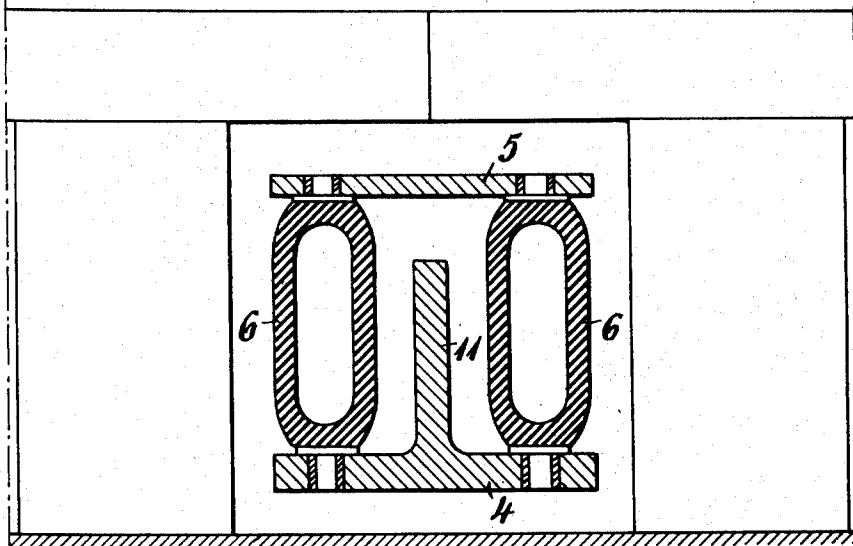
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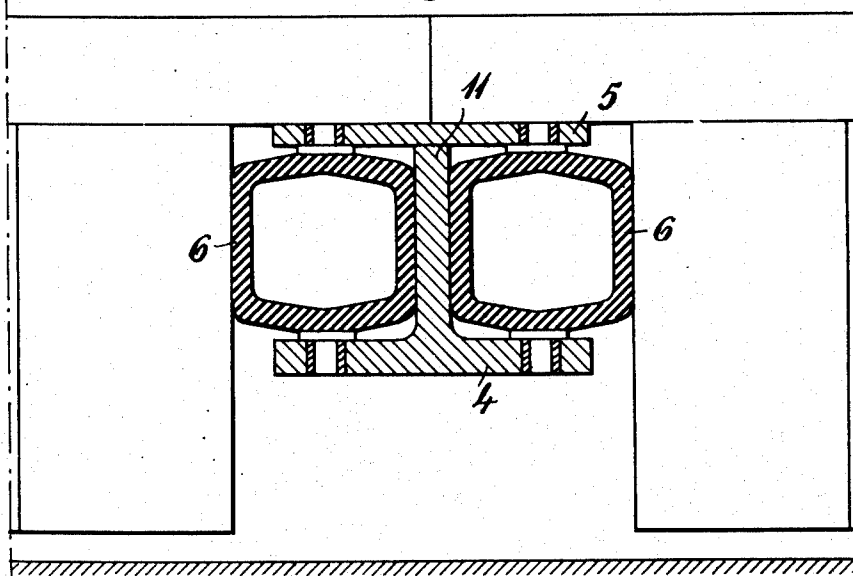
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*Fig. 8.*



*Fig. 9.*



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# UNITED STATES PATENT OFFICE

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## FORK FOR ELEVATING TRUCKS

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4 Claims. (Cl. 214—655)

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The present invention relates to an arrangement in forks for so-called elevating trucks, and particularly for those trucks which are used for elevating and transporting piles of bricks. In brick depots in which the bricks are piled by means of elevating trucks, the bricks are usually piled in such a manner that there are formed horizontally extending spaced channels the arms of the truck fork being inserted in said channels when a pile of bricks is to be elevated. The skid bricks forming the side walls and the roof of the channels will thus serve as temporary supports. If trucks provided with forks of the usual type are used for elevating the pile of bricks, only those bricks which form the roof of the channels, and naturally also that part of the pile which is located above said bricks will be elevated, and those bricks which form the side walls of the channels, will be left. When the pile of bricks located on the truck fork is to be deposited, it is thus necessary to provide for spaces in the foundation into which spaces the arms of the fork can be inserted and unloaded from the bricks. This arrangement of the foundation involves heavy manual work at the loading and elevation which in other respects is mechanized to a great extent. It has been tried to eliminate this inconvenience in different ways. The expedient most close at hand is to try to bring along also those bricks which form the side walls of the channels. However, the known devices used for this purpose are rather complicated and therefore expensive and unreliable with respect to their operation.

The present invention has for its object an improvement in the arms of the truck fork, for elevating also the supports forming the side walls of the channels, said improved construction being simple and reliable with respect to its operation.

The fork arm of the truck according to the present invention is substantially characterized by a lower plate rigidly connected to the fork, a movable upper plate, and a side wall of flexible material located between said plates on at least one side of the arm, said wall being adapted to bulge outwards from the centre line of the arm when the upper plate is being pressed down against the lower plate.

Different embodiments of the invention are shown by way of example on the accompanying drawings, in which Figs. 1a and 1b are a front view and a side view respectively of a truck fork, Fig. 2 a side view of a truck fork arm, partly in section, Figs. 3 and 4 sections on lines III—III and IV—IV respectively of Fig. 2, Figs. 5 to 7

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are transverse vertical sections through other fork arms embodying the invention, and Figs. 8 and 9 are fragmentary vertical sections through a fork arm located within a channel between two skid bricks; Fig. 8 showing the fork arm free from the bricks, and Fig. 9 showing the arm elevated to lift the bricks.

As will be seen from Fig. 1, the truck fork consists of a back-piece 1 in the form of a grating which on its rear side is provided with projections 2 for fixing same, and at the bottom carries the fork arms 3 extending forwards substantially at right angles to the back-piece. As shown in Fig. 2, the fork arms 3 substantially consist of a lower, stationary plate 4; an upper plate 5 which is movable relatively to the stationary plate 4, and elements 6 of flexible material located between said two plates. In the embodiment shown, there are three tubular elements 6 on each side of the fork arm. However, it is self-evident that the invention is not restricted to this number. Between the elements 6 there are provided guide-members for guiding the movement of the movable plate 5. As will be seen from Fig. 4, said members consist of a cylindrical socket 7 fixed to the lower plate 4 and of a pin 8 fitting into said socket and fixed to the upper plate 5. In its lower, inner portion the socket 7 is provided with an annular groove 9 which is open in the downward direction, and which at the top merges into the normal section of the socket by means of a shoulder forming a stop for a washer 10 fixed on the pin 8. The shoulder and the washer act together to limit the upward movement of the pin 8. In its lowermost position the plate 5 rests on the plate 4 by means of the upper edge of the cylindrical guide member 7 and the upper edge of a flange 11 fixed between the members 7 in the lower plate. The above mentioned guide members are not absolutely necessary in order that the fork arm shall function in the desired manner but they steady the construction which often is of advantage. The guide devices may also be constructed in some other manner without going beyond the scope of the invention.

As shown in Figs. 3 and 7-9, the elements 6 may be substantially oval in cross section when no load is imposed upon the top plate, and designed in such a manner that when the elements are compressed by the weight of the bricks lifted by the upper plate the side walls bulge outwards, so that the oval cross section becomes more round. The symmetric design of the elements involves the advantage that the elements when one of their side walls has be-

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6066 too much worn, can simply be turned round so that the wall previously facing the flange 11 will now be directed outwards. As shown, the elements may be hollow but also solid or filled with some yielding material, such as sponge rubber, in order to become more steady. It is also possible to provide leaf springs 16 within the elements, said springs having such an initial tension that they assist in bulging the elements.

Fig. 5 shows a modification of the elements 6 which are made in the form of shallow channels of approximately half oval cross-section, the lower flanges of which are fixed to the lower plate 4 by means of bolts 12 and the upper flanges of which are vulcanized to a plate 13 common to both elements, said plate 13 being provided with a pin 14 fitting into a corresponding recess in the upper plate 5. Fig. 6 shows a modification of the device according to Fig. 5 in which the elements 6 are fixed to both plates 4 and 5 by means of bolts 12.

Fig. 7 shows an embodiment of the fork arm which is intended for the arm located farthest to the left in Fig. 1a. The stationary plate is in this case provided with a vertical plate 15 which is rigidly connected to the first mentioned plate at right angles to the same so that the two plates form an angle-iron. This construction offers an increased steadiness and a better guidance of the movable plate 5 which, when pressed down, can go clear of the upper edge of the wall 15.

The device according to the invention operates in the following manner. The bricks are piled in such a manner on a series of rows of skid bricks that spaced channels are formed, the spaces between the channels corresponding to the distance between the fork arms. When the pile of bricks is to be elevated, the arms are inserted in said channels, see Fig. 8. When the load is being elevated, the movable plate will be pressed downwards due to the compression of the elements 6 until the pressure corresponds to the resistance of these elements or until the plate 5 comes to rest against the flange 11. During this operation the side walls of the elements are pressed or bulged outwards (Fig. 9), so that the elements in two adjacent arms will clamp between them the fundamental bricks forming the side walls of the channels. Said bricks will thus follow the other bricks of the pile when the elevation continues. When depositing the pile and lowering the fork the elements 6 will gradually be unloaded and assume their original form while disengaging from the skid bricks which are thus left when the fork is withdrawn. The fork is generally constructed in such a manner that there is room for two bricks standing on edges between the arms.

The elements 6 may be made of rubber or any material possessing the required flexibility and

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offering sufficient friction to the bricks in order that it shall be possible to elevate the same under the influence of the pressure exerted by the elements. Thus, the invention is not restricted to the embodiment of the elements disclosed and described, but it also comprises other embodiments.

I claim:

1. In a truck fork for lifting articles stacked on spaced skid supports and also the skid supports; a truck fork frame adapted to be secured to an elevator, and truck fork arms carried by said frame and spaced apart for introduction into the respective channels at opposite sides of a plurality of skid supports; each truck fork arm comprising an upper plate, a lower plate rigidly secured to said truck fork frame, said lower plate being of angular cross-section and having a central leg extending vertically in the direction of said upper plate and terminating short of the underface of said upper plate when said fork arm is unloaded, and means yieldingly supporting said upper plate on and for vertical movement with respect to the lower plate; said supporting means comprising a flexible material wall having a convex surface initially spaced from the adjacent surface of a skid support, said flexible material wall being bowed outwardly into frictional engagement with the skid support by compression of said flexible material wall on lifting of the truck fork to impose a load upon said upper plate and said central leg effecting lifting engagement with the underface of said upper plate.

2. In a truck fork, the invention as recited in claim 1, in combination with means guiding said upper plate for vertical movement.

3. In a truck fork, the invention as recited in claim 1, wherein said flexible material wall is tubular and of substantially oval cross-section when relieved from load.

4. In a truck fork, the invention as recited in claim 1, wherein said flexible material wall is of shallow channel form in cross-section.

HANS ERIC NILSSON.

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