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GRAB FOR HOISTING LOADS
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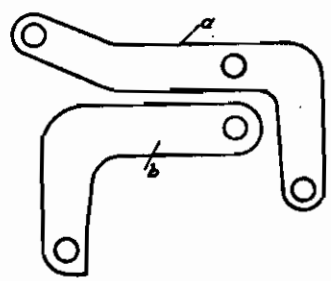
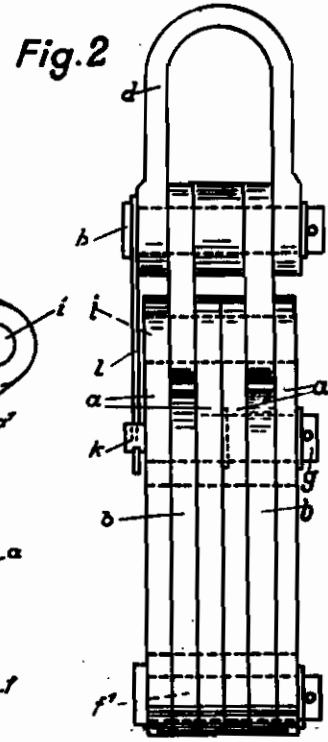
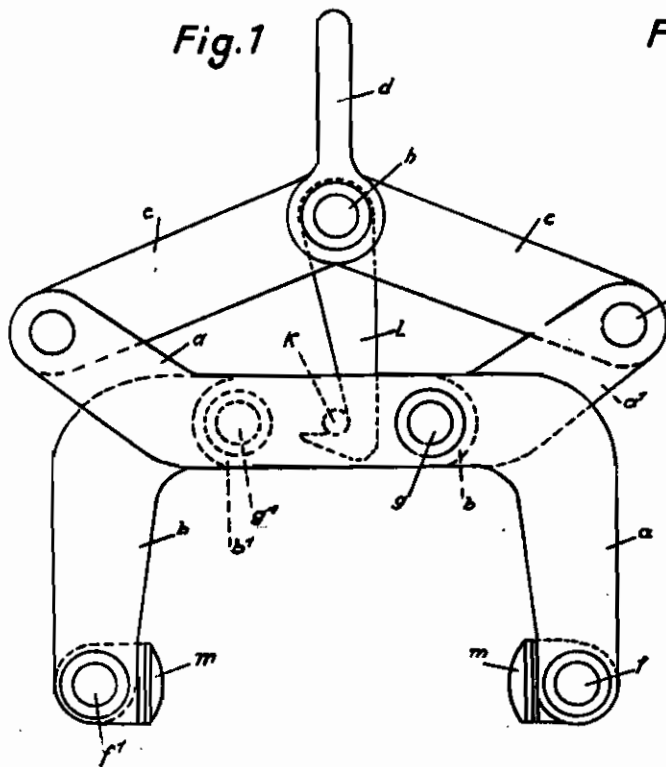
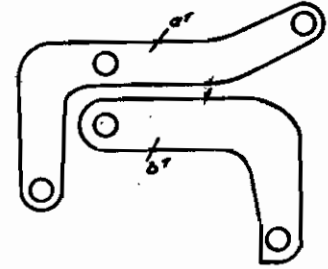


Fig. 3



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GRAB FOR HOISTING LOADS

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The invention relates to a grab for hoisting loads, said grab having crossed tong arms which close under the action of the load.

The known grabs of this type, in which the tong arms, actuated for instance by means of pull links, are connected by a hinge bolt arranged at the point of intersection of the arms or, when a bridge is provided, by two hinge bolts one at each side, possess the inconvenience, that the direction of pull of the tong arms extends obliquely to the surface or that an approximately perpendicular direction of pull is obtained only when the width for which the grab is opened corresponds to the distance between the hinge bolts. As, however, the closing force of the tong arms effected by the load depends on the direction of pull of these arms and is greatest in perpendicular direction to the surfaces at which the tong arms clamp the load, this closing force decreases the more the closer gets the link bolt or get the link bolts of the tong arms to the point of intersection of these arms. Whereas the closing force of grabs with tong arms connected at the point of intersection decreases with increasing width of opening of the tongs, this occurs, in grabs in which the oscillation points of the tong arms are displaced by a bridge in outward direction at both sides, only when the tongs spacing is greater or smaller than the distance between the hinge points. A grab of this last type possesses therefore a favorable efficiency only when the distance between the hinge points and the width of the opening of the tongs are approximately equal, that is only at a certain opening width of the tongs or at a certain breadth of the load.

According to the invention a closing force of the grab directed approximately perpendicularly to the load and therewith a favorable efficiency of the grab is attained at any opening width of the tongs, thereby that each tong arm is connected at the lower end with an auxiliary arm, the free end of said auxiliary arm being hingedly connected with the other tong arm, the hinge points of the auxiliary arms being situated at each side outside the crossing of the tong arms. The tong arms and auxiliary arms of the grab may consist of several superposed arms. For obtaining a uniform pressure surface of the tong arms upon the load, pressing pieces may be provided on the lower ends of the tong arms, said pressing pieces being oscillated relative to the tong arms in dependence on the movement of the auxiliary arms.

By the construction of the grabs according to

the invention an increased closing force of the tong arms acting approximately perpendicularly to the direction of pull is obtained at all widths of the opening of the tongs, so that the grab can be used for lifting loads of different breadths and securely holds these loads with the clamping force which is required.

A grab constructed according to the invention is illustrated by way of example in the accompanying drawing, in which

Fig. 1 shows the grab in front view,

Fig. 2 shows it in side view, and

Fig. 3 shows separately the tong arms and the auxiliary arms of the grab.

The grab consists substantially of the crossing tong arms a, a^1 and of the auxiliary arms b, b^1 connected with the tong arms by means of bolts f, g . The auxiliary arm b is hingedly fixed on the tong arm a by the bolt g and is connected at its lower end by a bolt f^1 with the tong arm a^1 . In similar manner the auxiliary arm b^1 is hingedly mounted on the tong arm a^1 by means of a bolt g^1 and hingedly connected at its lower end by the bolt f with the tong arm a . The hinge points g, g^1 can be arranged out of the middle, so that the tong arms a, a^1 as well as the auxiliary arms b, b^1 cross. U-shaped pressing pieces m are held on the lower ends of the tong arms a, a^1 by the bolts f, f^1 and form a closed pressing face and bear preferably with their bridge n against the auxiliary arms b, b^1 . The grab may be fixed on the hoisting rope of the lifting device by pull links c which, by means of bolts i , are hingedly connected with the free ends of the tong arms a, a^1 and connected by a bolt h with a hoisting eye d . For holding the tong arms in the open position, a hook l is provided which is oscillatable about a bolt h and engages over a bolt k on one of the tong arms a, a^1 and is unhooked when the grab closes about the load.

As shown in Fig. 2, several tong arms a, a^1 and auxiliary arms b, b^1 may be arranged superposed the one on the other and may be connected the one with the other by means of the bolts f, g or f^1, g^1 . In grabs for smaller loading, the free ends of the tong arms a, a^1 may be constructed as handles, so that the grab may be operated by hand.

The operation of the grab constructed according to the invention is as follows:

After the grab has been lowered onto the load the hook l is unhooked, whereby the tong arms a, a^1 automatically close under the action of the weight of the hook until the pressing pieces m press against the surface of the load. At the

hoisting of the grab, the load effects an additional closing pressure of the tong arms by the lever effect of the tong arms a, a^1 in conjunction with the auxiliary arms b, b^1 hingedly mounted on these tong arms at opposite points, so that the load is rigidly clamped between them. The opening of the grab or the detaching of the tong arms from the load is automatically effected when the load is put down or after the tong arms a, a^1 have come to rest on top of the load when the grab is further lowered until the locking

hook l engages over the pin k . Instead of the locking hook l as shown, any other suitable means for holding the tong arms in the open position may be provided. The number of superposed tong arms a, a^1 and auxiliary arms b, b^1 can be adapted to the load actually to be hoisted or the grabs for heavier loads can be equipped with a corresponding number of superposed tong arms and auxiliary arms.

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