July 7, 1936. F. K. FILDES 2,047,139

LIFTING SLING

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FIG. I.

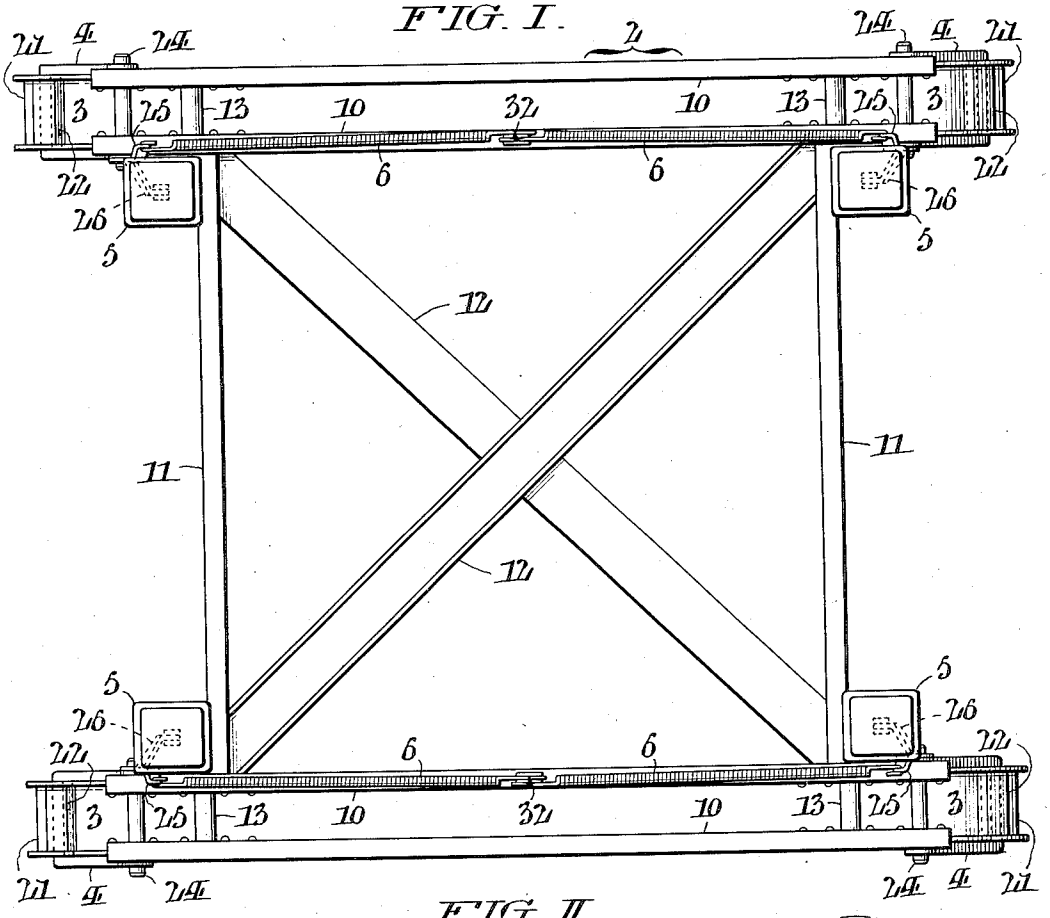
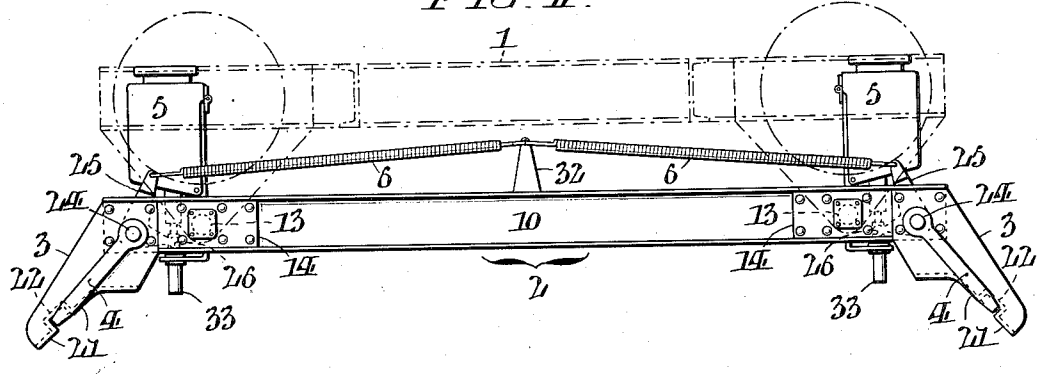


FIG. II.



WITNESSES:
John A. Weidler
William Bell, Jr.

INVENTOR:
Frederick K. Fildes,
BY Fraley & Paul
ATTORNEYS.

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FIG. III.

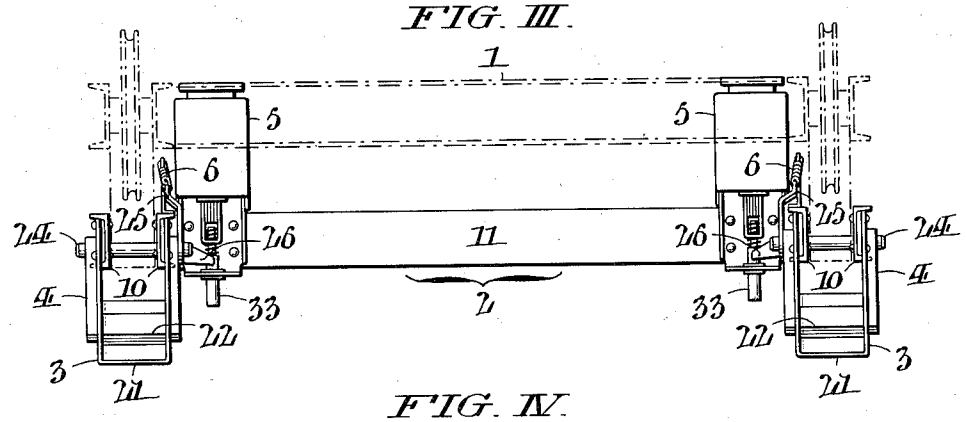


FIG. IV.

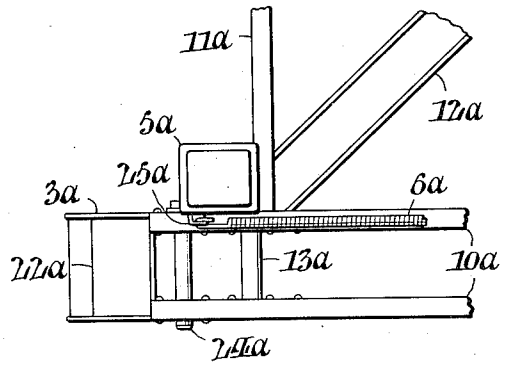


FIG. V.

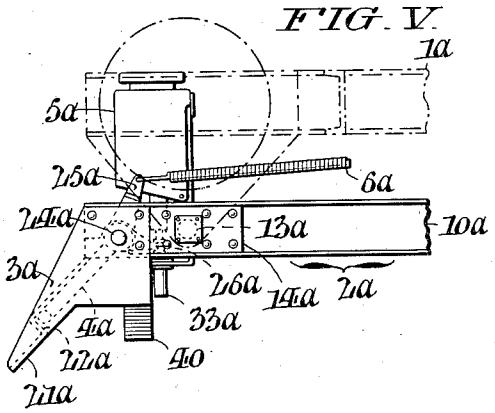
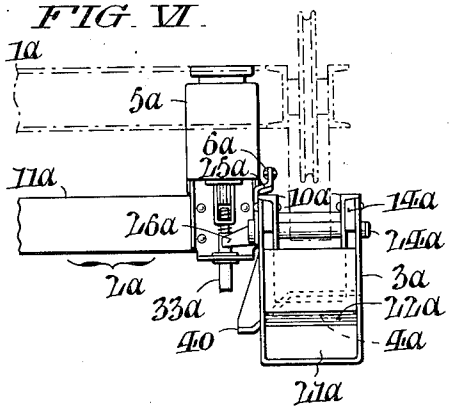


FIG. VI.



WITNESSES:

John A. Weidler

William Bell, Jr.

INVENTOR:

Frederick K. Fildes,

BY Fraser & Paul

ATTORNEYS.

July 7, 1936. F. K. FILDES 2,047,139

LIFTING SLING

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FIG. VII

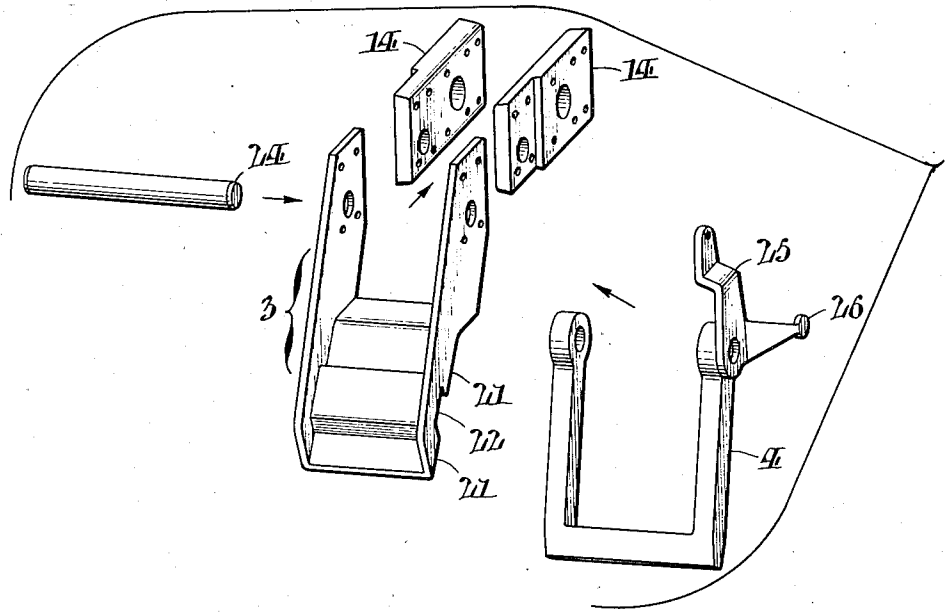
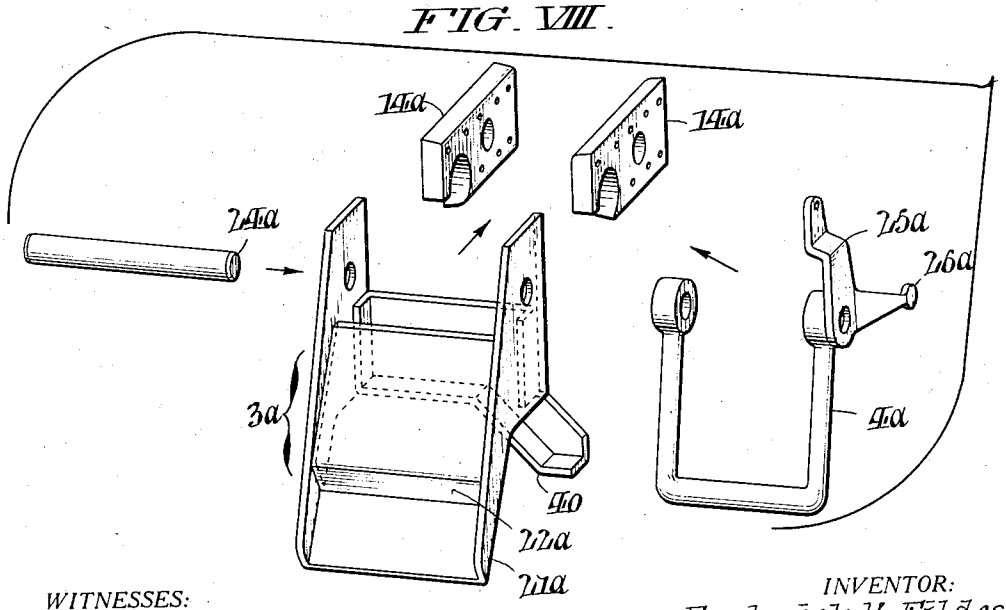


FIG. VIII.



WITNESSES:

John A. Weidler

William Bell, Jr.

INVENTOR:

Frederick K. Fildes,

BY Fraser & Paul

ATTORNEYS.

Patented July 7, 1936

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UNITED STATES PATENT OFFICE

2,047,139

LIFTING SLING

Frederick K. Fildes, Altoona, Pa., assignor to The Pennsylvania Railroad Company, Philadelphia, Pa., a corporation of Pennsylvania

Application February 1, 1936, Serial No. 61,909

7 Claims. (Cl. 294—67)

My invention relates to lifting slings used in moving demountable truck bodies and shipping containers. Many lifting slings have been proposed for moving shipping containers but the problem is to efficiently couple the sling to the container without a man's riding the sling or climbing up on to the container top. The riding of the sling is dangerous to the workman and the weight of a man on the top of many containers and truck bodies will seriously damage them.

Consequently the principal object of my invention is the provision of a serviceable lifting sling which may be coupled and uncoupled without the presence of a workman on the sling or container. Another object is the provision of a lifting sling which guides itself into the coupling position as it is lowered over a container or truck body. Another object of my invention is a simple, rugged and efficiently operated lifting sling without complicated structural features. Further objects and advantages of my invention will appear from the following description of a preferred embodiment thereof, referring to the accompanying drawings.

Of these drawings,

Fig. I shows a plan view of a lifting sling which is a preferred embodiment of my invention.

Fig. II shows a side view of same.

Fig. III shows an end view of same.

Fig. IV shows a fragmentary plan view of a corner of the frame of the lifting sling.

Fig. V shows a fragmentary side view of a corner of a lifting sling modified as to the outside hook guides.

Fig. VI shows a fragmentary end view of same.

Fig. VII shows an exploded view of the combination of hook guide and engaging link in the preferred form of my invention.

Fig. VIII shows an exploded view of the combination of hook guide and engaging link in the modified form of my invention.

For the purposes of a detailed description, the lifting sling shown in the drawings may be separated into a suspension frame 1 shown conventionally in broken lines only, a frame 2, outside hook guides 3, hook engaging links 4, engaging solenoids 5 and disengaging springs 6. The suspension frame 1, to which the frame 2 is fastened, is fully described in United States Patent to Fildes, issued July 31, 1934, No. 1,968,135 and need not be further described here.

The frame 2 is rectangular in shape and is made up of longitudinal members 10, transverse members 11 and diagonal bracing members 12. The construction must be rugged and durable because of the weights to be lifted. The longitudinal members 10 are each made up of a pair of beam-shaped pieces held in spaced parallel relation by spacing elements 13.

Secured to each end of each longitudinal member 10 is an outside hook guide 3. The hook guide 3 is riveted to brackets 14 which are riveted to the longitudinal member 10. The hook guide 3 has a guide surface 21 which inclines outwardly and downwardly from the frame 2. Recesses 22 are formed in the guide surfaces 21 to receive the hook engaging links 4 while the guide surfaces 21 are operating on the outside portions of container hooks in positioning the lifting sling. Thus there is no obstruction in the smooth operation of these guide surfaces 21. The outside hook guide 3 projects outside the container and requires no elevation and special formation of the back part of the container hook as is the case where a hook guide operates on the back of the container hook.

Pivotally attached to each hook guide 3 by a pin 24 is a hook engaging link 4 having operating arms 25 and 26. The operating arm 25 is connected to a spring 6 which is secured to anchoring arm 32 attached to frame 2. The operating arm 26 is pivotally attached to an actuating rod 33 of the solenoid 5 which is also attached to the frame 2. Thus there are four solenoids 5, one at each corner of the frame 2, and each independently operated. There are four springs 6, two secured at each common anchoring arm 32. Consequently the engaging links 4 are each independent in their operation.

The modified form of hook guide 3a shown in Figs. IV, V, VI and VIII, has a different form of recess 22a in the guide surface 21 and also a side hook guide 40 which aids in positioning the frame 2 transversely as do the outside hook guides 3 longitudinally. Recess 22a receives the sides of the link 4a into the guide 3a so that the sides of the link 4a aid in guiding the frame into position by contact with a container hook.

In operation, the lifting sling is positioned over a container or truck body and lowered so that the guide surfaces 21 of the guides 3 contact the outer parts of the container hooks. In this way the frame 2 quickly comes to rest on the tops of the container hooks. The solenoids 5 are then operated and the links 4 snap into engagement with the container hooks and are held there by the solenoids 5 until lifting is commenced. The solenoids 5 are released as soon as the links 4 begin to take the weight. When the container is lowered and the frame 2 again comes to rest on top of the container hooks, the spring 6 automatically

snap the links 4 out of engagement with the container hooks and seat them in the recesses 22 of the guide surfaces 21. This quick and efficient operation in coupling and uncoupling is accomplished without a workman either on the frame 2 or on the container roof. A definite time saving results from the harmonious operation of the coupling and uncoupling mechanisms, each working with a positive and precise motion at the proper time.

While I have described a preferred and modified form of my invention in detail, it will be apparent to those skilled in the art that many changes may be made and other forms adopted without departing from the spirit of my invention as defined in the annexed claims.

Having thus described my invention, I claim:

1. A lifting sling having a frame, outside hook guides attached to said frame, and hook engaging links attached to said guides, said links seating in recesses in said guides when in the disengaged position.

2. A lifting sling according to claim 1 characterized by the further fact that said links are held seated in said guides in the disengaged position by pressure means.

3. A lifting sling according to claim 1 characterized by the further fact that said links are held seated in said guides in the disengaged position by pressure means and said links are urged to the engaged position by engaging elements which overcome said pressure means.

4. A lifting sling according to claim 1 characterized by the further fact that said links are held seated in said guides in the disengaged position by pressure means and said links are individually urged to the engaged position by independent engaging elements which overcome said pressure means.

5. A lifting sling having a frame, outside hook guides attached to said frame, hook engaging links attached to said guides, said links seating in recesses in said guides when in the disengaged position, spring pressure means urging said hooks to the disengaged position, and an independent engaging solenoid for forcing each hook independently into the engaged position.

6. A lifting sling according to claim 1 characterized by the further fact that said outside hook guides have side hook guides for engaging the sides of container hooks.

7. A lifting sling according to claim 1 characterized by the further fact that said outside hook guides have inner side guides for engaging the inner sides of container hooks.

FREDERICK K. FILDES.