

July 7, 1936.

F. K. FILDES

2,047,140

LIFTING SLING

Filed Feb. 1, 1936

3 Sheets-Sheet 1

FIG. I.

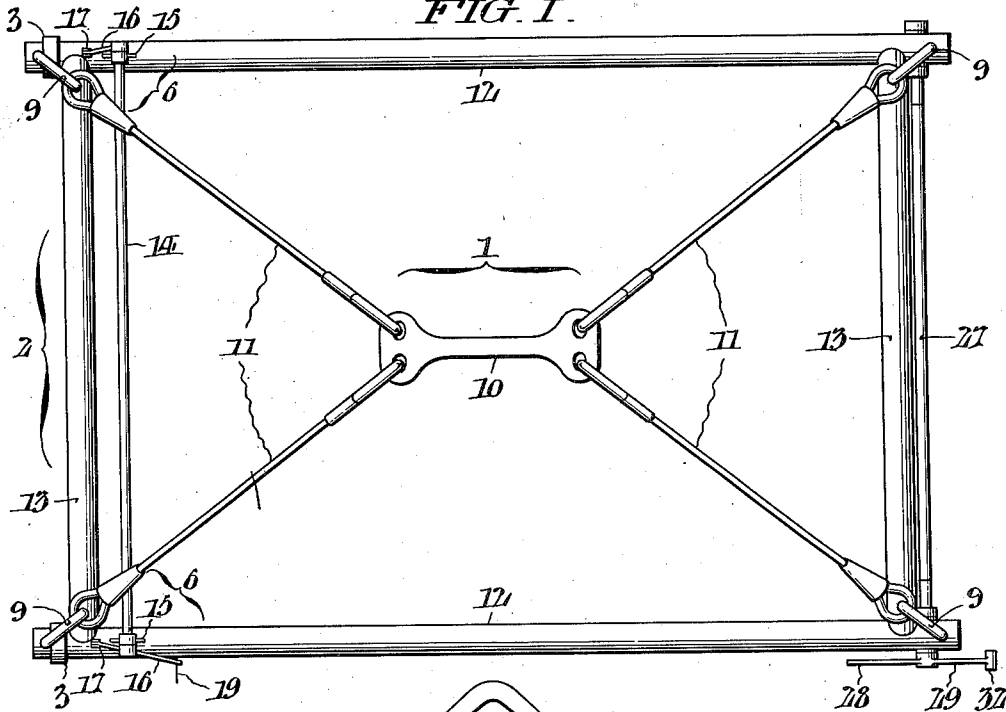
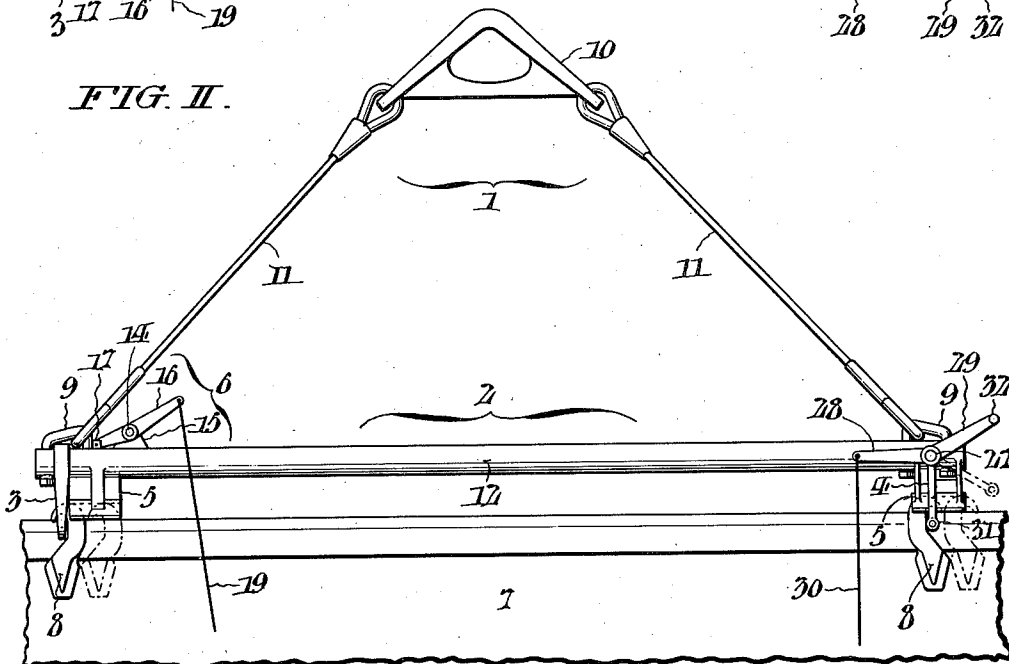


FIG. II.



WITNESSES:

John A. Weidler
William Dree, Jr.

INVENTOR:

Frederick H. Fildes,
BY Tracy Paul
ATTORNEYS.

July 7, 1936.

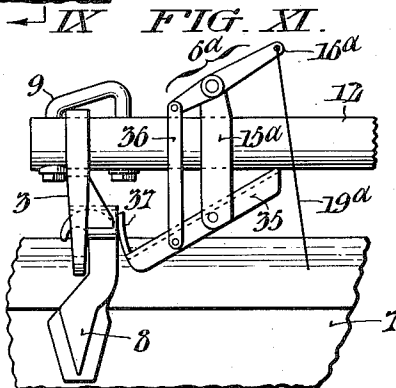
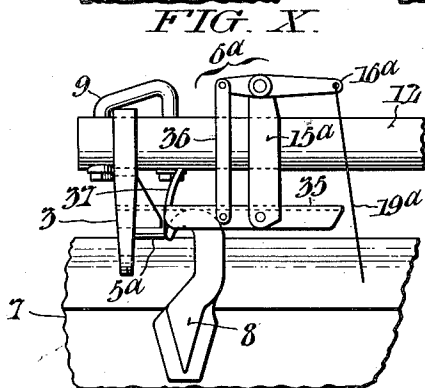
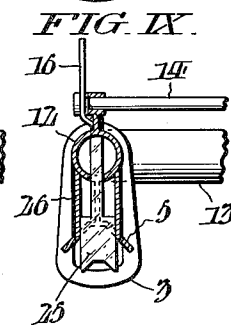
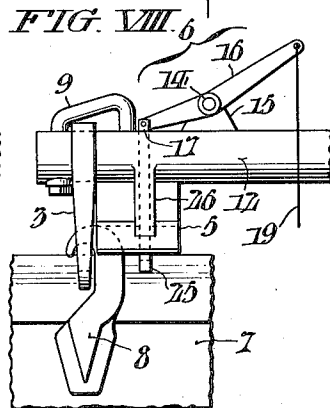
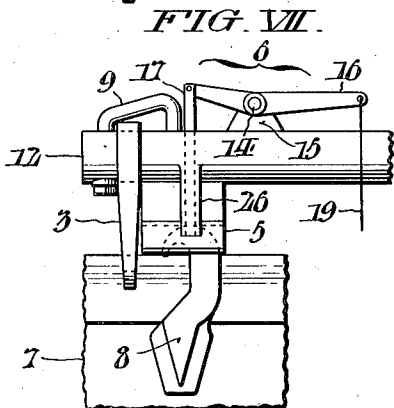
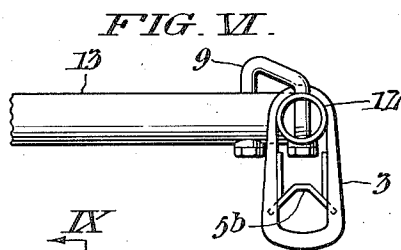
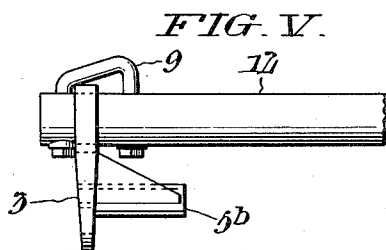
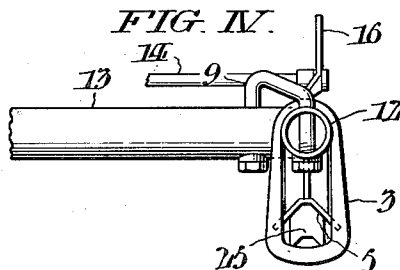
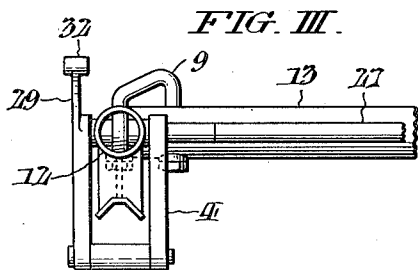
F. K. FILDES

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3 Sheets-Sheet 2



WITNESSES:

John A. Weidler
William Bell, Jr.

INVENTOR:

Frederick K. Fildes,
BY Faley & Paul
ATTORNEYS.

July 7, 1936.

F. K. FILDES

2,047,140

LIFTING SLING

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FIG. XII.

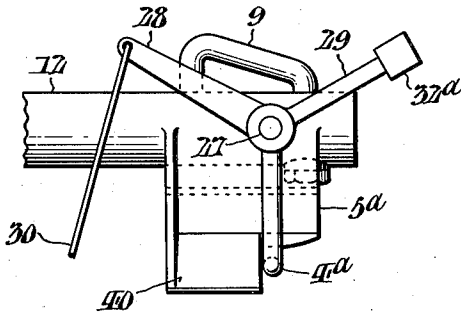


FIG. XIII.

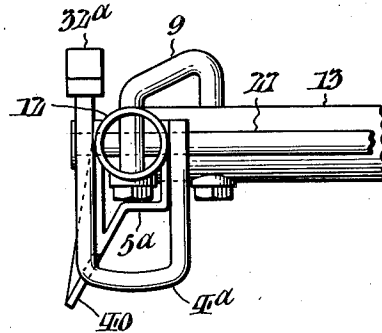


FIG. XIV.

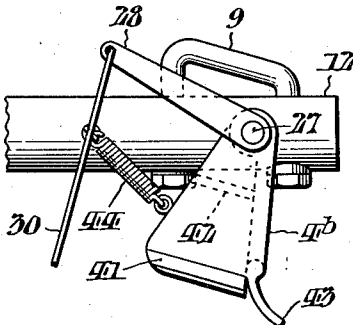


FIG. XV.

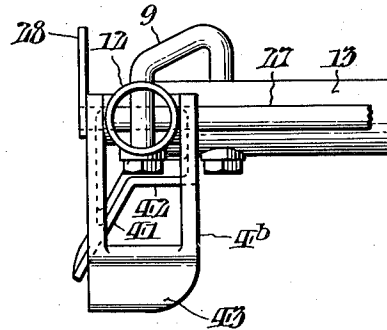


FIG. XVI.

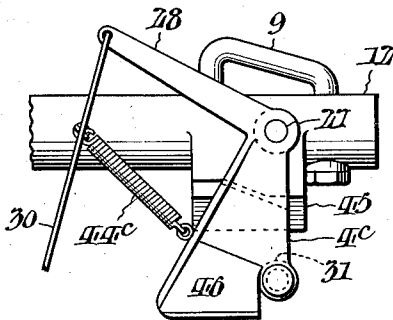
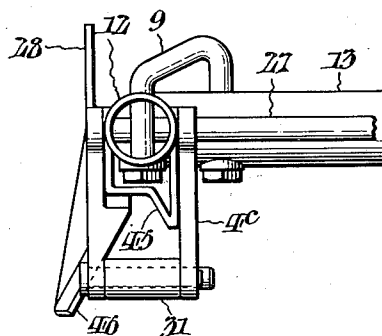


FIG. XVII.



WITNESSES:

John A. Weidler
William Bell, Jr.

INVENTOR:

Frederick K. Fildes,
BY *Italy Paul*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,047,140

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. 61,910

10 Claims. (Cl. 294—67)

My invention relates to lifting slings for moving railway containers and demountable truck bodies. The coupling and uncoupling of lifting slings is a source of much loss of time in moving containers and truck bodies. It is undesirable to place a workman either on the lifting sling or on the container to facilitate the coupling and uncoupling process. In the first place, such practice is dangerous to the workman and in the second place, a man's weight will injure many lightly constructed containers and truck bodies.

Consequently the primary object of my invention is the provision of a lifting sling which may be coupled and uncoupled with containers and truck bodies without loss of time and without the presence of a workman on the sling or on the container or truck body. Another object is the provision of a lifting sling which to a large extent automatically guides itself into place as it is lowered over the container. Another object is the provision of lifting sling which couples and uncouples by the simple manipulation of a trip rope or pole by an operator on the ground. Another object of my invention is the provision of a lifting sling which becomes locked into engagement when coupled with a container or truck body. Still further objects and advantages will become apparent from the following detailed description of a preferred embodiment of my invention, having reference to the accompanying drawings.

Of the 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 is a fragmentary end view of a corner of same, showing a movable hook-engaging link.

Fig. IV is a fragmentary end view of a corner of same, showing a fixed hook-engaging link.

Fig. V is a fragmentary side view of a corner of same, showing a modification of the fixed hook-engaging link.

Fig. VI is a fragmentary end view of the subject-matter of Fig. V.

Fig. VII is a fragmentary side view of a corner of the lifting sling, showing a fixed hook-engaging link with a locking device, in the process of engagement.

Fig. VIII shows a similar view of the subject-matter of Fig. VII with the engagement completed.

Fig. IX shows a section taken about the lines IX—IX of Fig. VIII.

Fig. X is a fragmentary side view of a corner of the lifting sling, showing a fixed engagement

link provided with a modified form of locking device and in the process of engagement.

Fig. XI shows a similar view of the subject-matter of Fig. X with the engagement completed.

Fig. XII is a fragmentary side view of a modified form of movable hook-engaging link and hook guide.

Fig. XIII is a fragmentary end view of same.

Fig. XIV is a fragmentary side view of a modified form of movable hook-engaging link and hook guide.

Fig. XV is a fragmentary end view of same.

Fig. XVI is a fragmentary side view of a modified form of movable hook-engaging link, and hook guide, and

Fig. XVII is a fragmentary end view of same.

For the purpose of a detailed description of the preferred embodiment and modified forms of my invention, the lifting sling and modifications shown in the drawings may be separated into the following principal elements: a suspension means 1, a frame 2, fixed hook-engaging links 3, movable hook-engaging links 4, hook guides 5 and locking devices 6. A demountable truck body 7 having hooks 8 is conventionally and partially indicated to better show the operation of the lifting sling.

The suspension means 1 is made up of a heavy metal eye 10 to which are fastened four cable pieces 11, each of which are in turn connected to a corner of the frame 2 by staples 9. The frame 2 is made up of longitudinal members 12 and transverse members 13 forming a usual rectangular frame. The fixed hook-engaging links 3 are tightly secured in place around the tubular section of the longitudinal members 12 of the frame 2, under staples 9, and in line with the hook guides 5. The hook guides 5 are an integral part of the longitudinal members 12 and are designed with a saddle-like under surface for guiding engagement with the tops of the hooks 8.

Each locking device 6 comprises a fulcrum piece 15 attached to the longitudinal member 12, an operating lever 16 pivotally attached to the fulcrum piece 15, a locking member 17 pivotally attached to the outer end of the operating lever 16 and extending through openings in the longitudinal member 12 and the hook guide 5, and an operating cord 19 attached to the inner end of the operating lever 16. The locking member 17 is enlarged into a locking face 25 at its lower end and this locking face 25 is designed to operate in a guide 26 formed on the hook guide 5 and the longitudinal member 12 as is shown more clearly in Figs. VII, VIII and IX. The lower edge of the

locking face 25 is designed to conform to the cross-sectional shape of the undersurface of the hook guide 5. When in the down position, the locking face 25 will be in position to contact with the back of hook 8 to prevent the disengagement of hook 8 and link 3. The locking devices 6 are cross-connected by a rod 14.

The movable hook engaging links 4 are cross-connected by rod 27 which pivotally attaches the two movable links 4 to the frame 2. Integrally attached to one movable link 4 is an operating arm 28 and a gravity arm 29 with a weight 32 by which the movable links 4 are operated, the rod 27 and the two movable links 4 being connected to move as an integral piece. An operating cord 30 is attached to the operating arm 28 so that an operator on the ground can operate the movable links 4. The gravity arm 29 urges the movable links 4 down to the engaged position and the operating arm 28 is used in overcoming the force of the gravity arm 29 in order to swing the movable links 4 to the disengaged position. Each movable link 4 has a roller guide 31 where the link 4 engages the hook 8 in order to facilitate engagement by rolling contact on the top end of the hook 8.

In operation, the frame 2 is suspended over a truck body 7 and gradually lowered until the hook guides 5 straddle the tops of the hooks 8. The operator at this time holds the locking devices 6 in the up position and the movable links 4 in disengaged position by the operating cord 30. A small lengthwise movement, guided by the hook guides 5, is then given to the sling. As soon as the hooks 8 engage the fixed links 3, the locking members 17 drop and the hooks 8 are locked into engagement with fixed links 3. The release of operating cord 30 allows the movable links 4 to swing down into engagement with hooks 8 under the force of gravity arms 29. The engagement is facilitated by the roller guides 31 on each movable link 4 when the positioning of the sling is not exact because the roller guides 31 will roll on the tops and over the ends of the hooks 8.

Uncoupling is accomplished by lowering the sling until the hooks 8 will clear the fixed links 3 and the movable links 4 will clear the hooks 8. Then the operating cord 30 is pulled, disengaging movable links 4 from hooks 8, and the sling, after lifting the locking devices 6 by pulling cords 19, is moved longitudinally until the fixed links 3 are disengaged from hooks 8. The coupling and uncoupling of sling and truck body 7 is thus accomplished with speed, efficiency, and without the presence of an operator on either the sling or truck body. The sling is positive in operation; it is simple and inexpensive in structure.

Certain modifications in my sling are shown in the drawings which have incidental advantages. A modified form of locking device 6a is shown in Figs. X and XI. Locking device 6a has an operating lever 16a pivotally attached to a double fulcrum piece 15a, a combination guide and locking member 35 and a link 36 pivotally attached to both the operating lever 16a and the locking member 35. The underside of the combination guide and locking member 35 is concave and conforms to the shape of the underside of the hook guide 5a so that a hook 8 will be guided into hook guide 5a from the member 35. To prevent the member 35 from swinging up too far a lug 37 is provided to engage the frame 2 as the member 35 is forced upward. The locking device

6a is operated by an operating cord 19a which is accessible to an operator on the ground.

In Figs. V and VI a hook guide 5b is shown fastened to fixed link 3 instead of to the frame 2.

Figs. XII and XIII show a modification of the hook guide 5a for use with the movable links 4a. The hook guide 5a has an extended outside guide surface 40 for contacting the outer side of hook 8 and no inside guide surface.

Figs. XIV and XV show a movable link 4b which carries as an integral part, an outside guide surface 41, a top guide surface 42 and an engaging lip 43, all for guiding contact with hook 8. The gravity arm 29 is replaced by a spring 44.

Figs. XVI and XVII show a movable link and guide modified so that the link 4c carries an outside guide surface 46 and the hook guide 45 is without an outside guide surface. The gravity arm 29 is replaced by a spring 44c.

While I have described the preferred embodiment and modifications 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 suspension means, a frame, fixed hook-engaging links attached to one end of the frame, movable hook-engaging links attached to the other end of the frame, and hook guides associated with the hook-engaging links.

2. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached at one end of the frame, movable hook-engaging links attached at the other end of the frame, said movable links have guide rollers, hook guides associated with the hook-engaging links, locking devices associated with the fixed hook-engaging links, means for operating the locking devices from the ground, side hook guides attached to said movable hook-engaging links, and control means for operating the movable links.

3. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook-engaging links having a control means operable by an operator on the ground.

4. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook-engaging links having a control means operable by an operator on the ground and a gravity arm.

5. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook-engaging links having an operating arm for swinging the movable links to the disengaged position and a gravity arm for urging the movable links to the engaged position.

6. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, each of said fixed hook-engaging links having associated therewith a locking device for holding the sling in engagement after coupling.

7. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame,

each of said fixed hook-engaging links having associated therewith a locking device having a hook guide for facilitating hook engagement.

5 8. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook-engaging links having a control means operable by an operator on the ground
10 and a pressure means opposing said control means.

9. A lifting sling having a suspension means,

a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook-engaging links having side hook guides and top hook guides attached thereto. 5

10. A lifting sling having a suspension means, a frame, fixed hook-engaging links attached to one end of the frame, and movable hook-engaging links attached to the other end of the frame, said movable hook engaging links having guide
10 rollers.

FREDERICK K. FILDES.