May 18, 1937. F. K. FILDES 2,080,813

LIFTING SLING

Filed Dec. 3, 1936 3 Sheets-Sheet 1

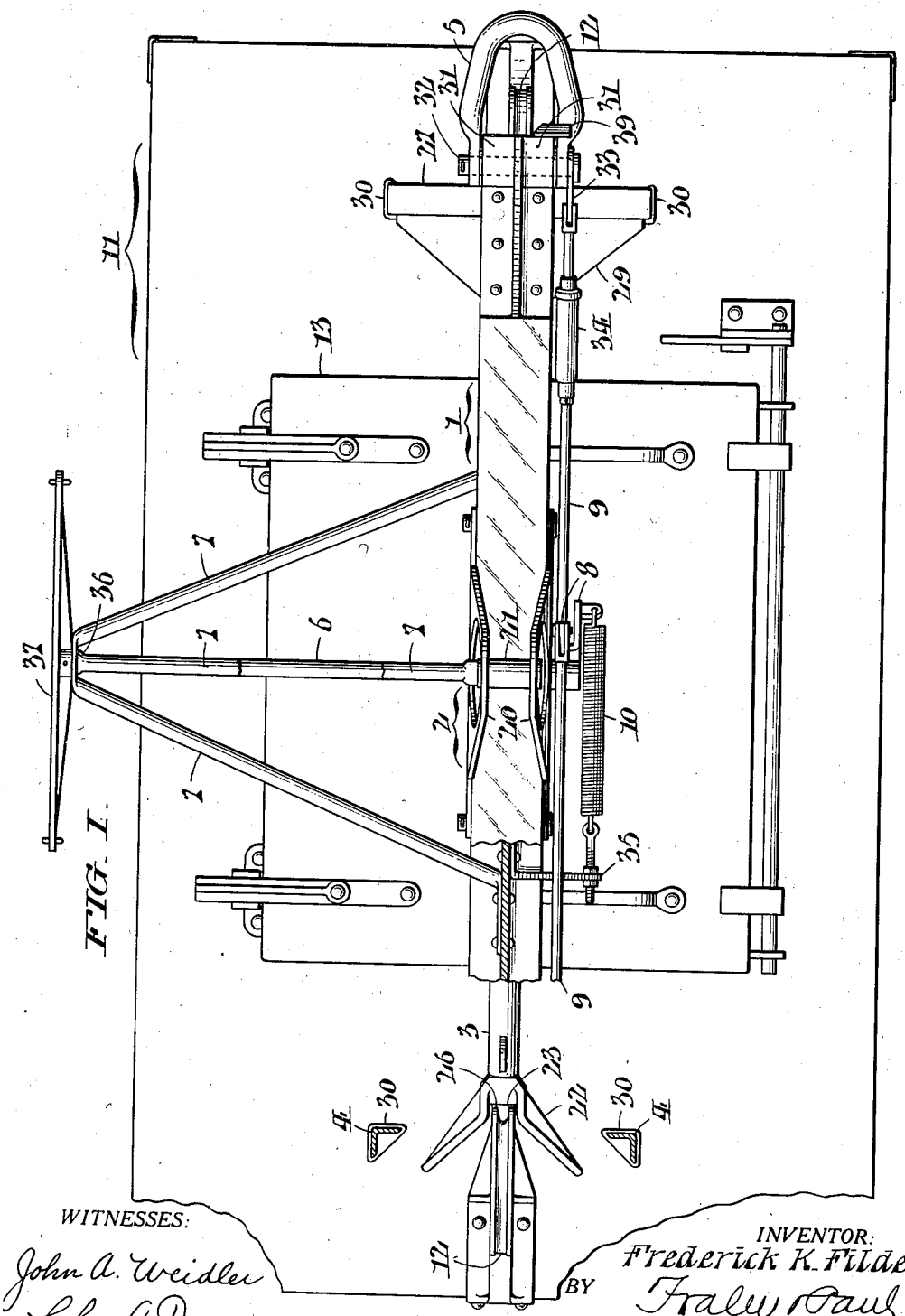


FIG. I.

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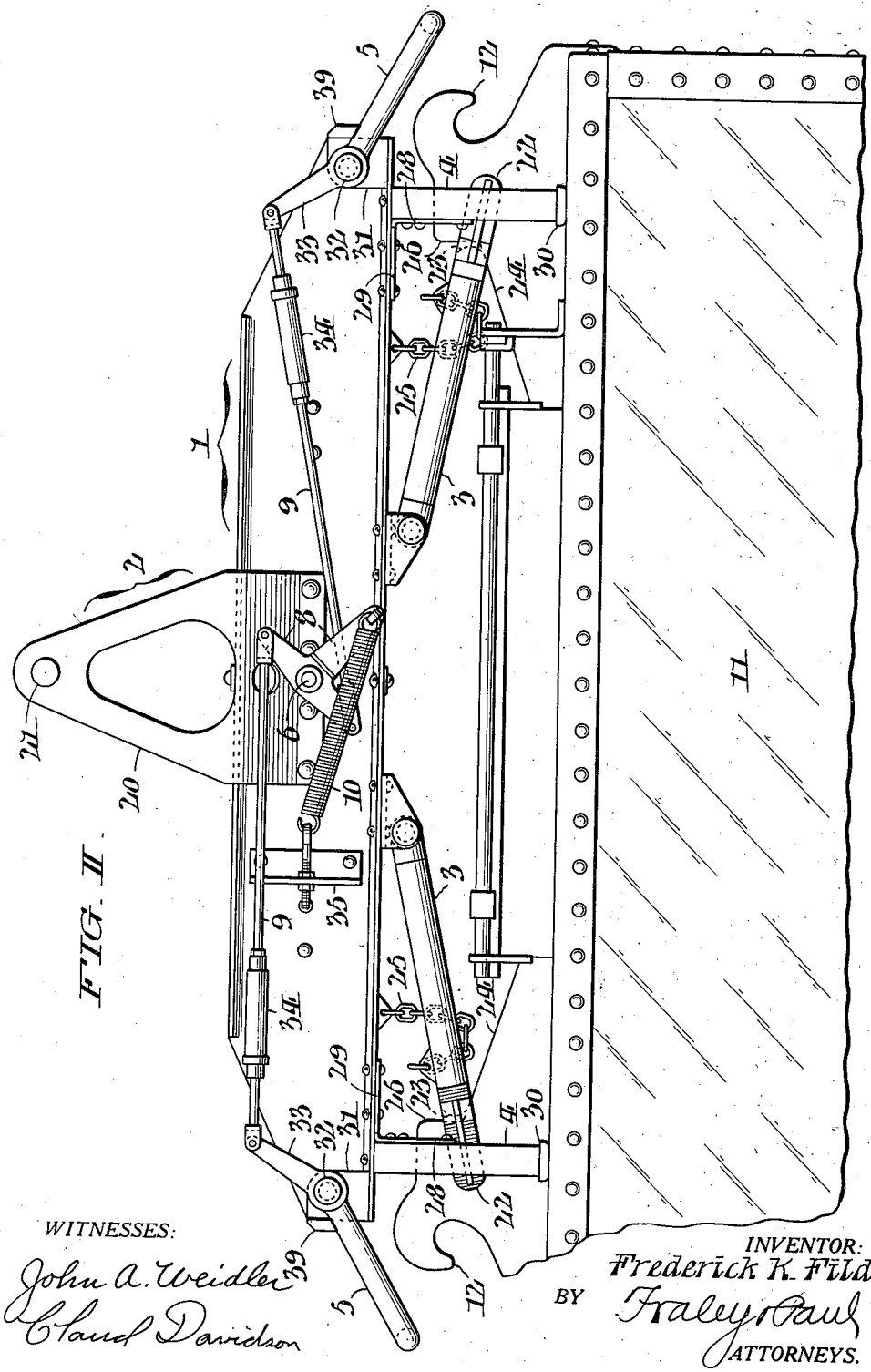


FIG. II.

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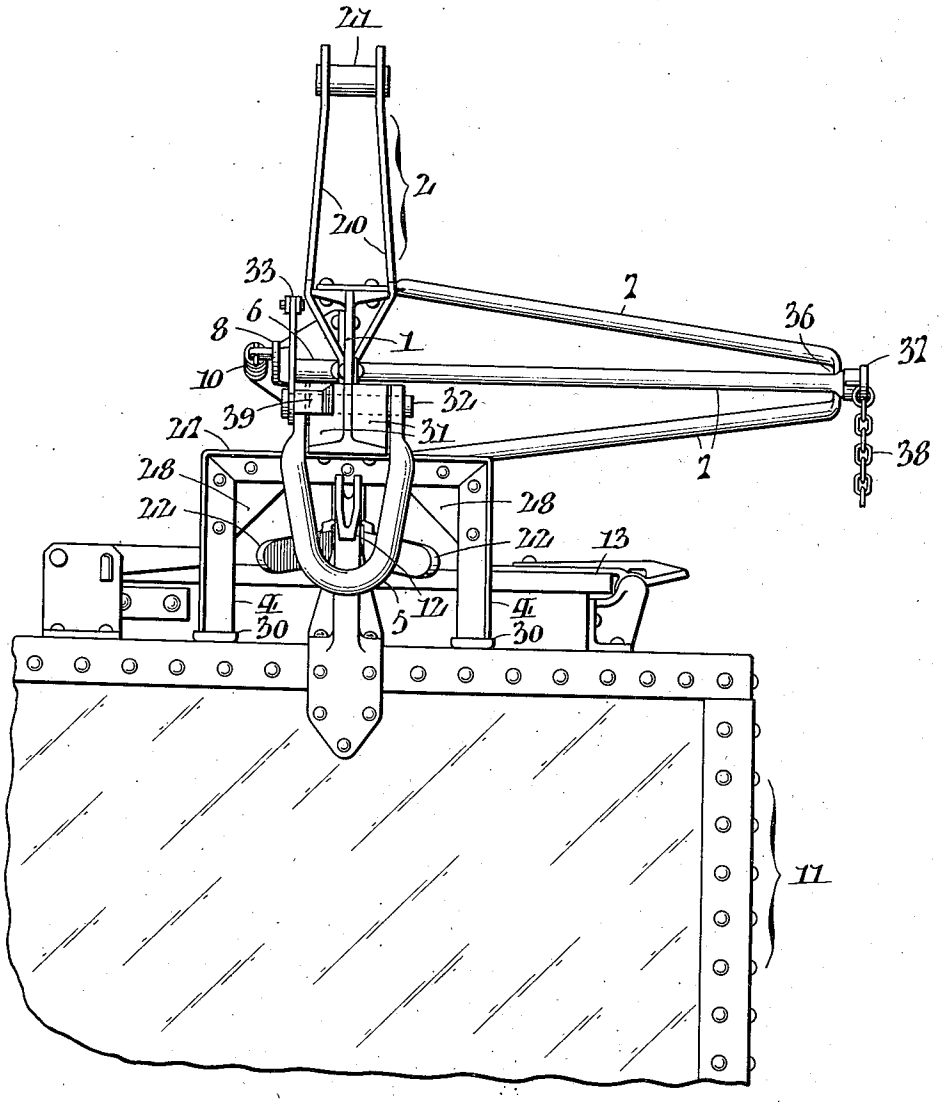
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FIG. III



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UNITED STATES PATENT OFFICE

2,080,813

LIFTING SLING

Frederick K. Fildes, Altoona, Pa.

Application December 3, 1936, Serial No. 113,973

3 Claims. (Cl. 294—67)

My invention relates to lifting slings for moving railway containers and the like. The coupling and uncoupling of lifting slings is the source of much loss of time in moving containers because of the difficulty of controlling the sling over the container top. It is undesirable to place a workman either on the lifting sling or on the coupler to facilitate this coupling and uncoupling operation.

Consequently the primary object of my invention is the provision of a lifting sling which may be coupled and uncoupled with containers without loss of time and without the presence of a workman on the sling. Another object is the provision of a lifting sling which to a large extent automatically guides itself into place as it is centered over the container. Another object is the provision of an automatically centering sling for use with containers having only two instead of four hooks.

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.

Fig. I shows a plan view of the preferred embodiment of my invention, partially in section and in conjunction with a container.

Fig. II shows a side view of the same.

Fig. III shows an end view of same.

For the purposes of a detailed description, the preferred embodiment of my invention may be resolved into the following elements: a frame 1, a suspension element 2 attached to the central part of the frame 1, centering arms 3 pivotally attached to the frame 1, stabilizing legs 4, hook engaging links 5, and an operating means comprising an operating rod 6, struts 7, operating lever 8, connecting rods 9 and a toggle spring 10. A container 11 having two hooks 12 and a top door 13 is conventionally indicated to show the operation of the device.

The frame 1 is a heavy girder-like beam to which is riveted at its central portion the suspension means 2. This suspension means 2 has two side pieces 20, one riveted to each side of the frame 1. The two side pieces 20 are joined at the top by a heavy cylindrical piece 21 to receive the hook of a suspension means. As will be noted in the drawings, the side pieces 20 have lightening holes formed in them. Pivotally attached to the underside of the frame 1 are the centering arms 3 having bifurcated end pieces 22. These bifurcated end pieces 22 are rounded at 23 between the bifurcations in order to provide a surface which will ride easily on an inclined guide 24 formed on the back of the hook 12 before abutting against abutment 26 also formed on the back of the hook 12. Chains 25 hold the arms at the proper angle in the disengaged position to allow a proper engagement of the arms 3 with the guides 24 in coupling.

The stabilizing legs 4 are formed integrally with a cross-piece 27 from a piece of angle iron, the cross-piece 27 being riveted to the frame 1. The legs 4 are bent down to be at right angles with the cross-piece 27, triangular sections of the web of the angle iron being cut out to allow bending and to form neat corners which are strengthened by gusset plates 28. These gusset plates 28 are formed integrally with a strengthening plate 29 bent at right angles and fastened to the frame 1 by rivets. Thus the legs 4 and the cross-piece 27 are firmly attached to the frame 1 to withstand heavy usage. Welded to the ends of the legs 4 are rounded caps 30 which permit easy movement on the surface of the container 11.

The length of these legs 4 is important in order that they function well as stabilizers to prevent the coupler from turning over when it is lowered onto the container top. Consequently the length of these legs 4 is such that they just take the weight of the frame 1 when the centering arms 3 are in position with the frame centered as in Fig. II. It will be noted in the drawings that the legs 4 straddle the hooks 12, and that the links 5 are free to engage or disengage the hooks 12 when the legs 4 are resting on the container 11.

The two hook-engaging links 5 are pivotally attached to the ends of frame 1 by bearing blocks 31 welded to the frame 1. These bearing blocks 31 provide bearings for the pins 32 of the links 5 and insure easy motion and strength. The links 5 have operating arms 33 which are connected to the operating lever 8 by the connecting rods 9 pivotally attached to the operating arms 33 and the operating lever 8. Stops 39 are provided to limit the outward swinging of the links 5. The connecting rods 9 have an adjustment feature 34 for lengthening and shortening which are of a usual type. The operating lever 8 has three arms, two of which are connected to the links 5 and the third is connected to a toggle spring 10 attached to the frame 1 by a clip 35 and functions as a toggle in urging the lever 8 to the full coupling or uncoupling position. This spring 10 urges the operating lever 8 to turn about its pivotal attachment to the frame 1 in a direction to swing the links 5 either to the full inward or outward posi-

tion. The operating lever 8 is pivotally attached to the frame 1 by the operating rod 6 which rotates in a bearing formed in the frame 1 and a bearing 36 at the outer end of the rod 6 at the juncture of the two struts 7. These struts 7 are riveted to the frame 1 at their inner ends. Mounted rigidly on the outer end of the operating rod 6 is a control lever 37 from the ends of which control chains 38 hang to be within reach of an operator on the ground. It is important that the length of the operating rod 6 be sufficient to extend beyond the container to which the coupler is coupled in order that the control chains 38 do not rub against the container. This insures an efficient control of the device.

While the operation of the coupler is obvious from the above description, the following description of a cycle of operation may be useful. When the container 11 is on the ground in readiness to be moved, the coupler is suspended over the container 11 and lowered until the centering arms 3 engage the guides 24. Any tendency to upset during this lowering process is prevented by the stabilizing legs 4. The centering arms 3 ride up the guides 24 until they both abut against abutments 26. In this position the legs 4 rest on the top of the container and the links 5 are so positioned that they may be swung inwardly into contact with the hooks 12 by the operator on the ground. These links 5 are swung into the coupling position by rotating the control lever 37 by means of control chains 38 to overcome the pressure of spring 10. The control lever 37 being integrally attached to the control rod 6 rotates the control rod 6 which in turn rotates the operating lever 8. The operating lever 8 is then rotated against the pressure of spring 10 and this motion is transmitted through connecting rods 9 and operating arms 32 to the links 5 which are thus swung into coupling relation with hooks 12. The links 5 are held in this position by the pressure of spring 10 and the coupler is lifted to take the weight of the container 11. In uncoupling, the container is lowered and the coupler comes to rest on top of the container, the coupler being supported by the legs 4. The operator then rotates the operating lever 8 against the pressure of the spring 10 and swings the links 5 to the disengaged position after which the coupler may be at once lifted clear of the container 11.

It is thus clear that this invention provides a simple and rugged coupling device which is efficient in its operation and does not require the presence of a man on the container to effect the coupling and uncoupling operation. Further, the device operates positively in coupling and in uncoupling and much time is saved in performing these operations.

While I have described the preferred embodiment of my invention in some detail, it will be obvious to one skilled in the art that various modifications and variations may be made to the preferred embodiment described above without departing from the spirit of my invention as hereinafter claimed.

Having thus described my invention, I claim:

1. A lifting coupler comprising a frame, a suspension element attached to the central portion of said frame, centering arms pivotally attached to the frame and operable on the hooks of a container, stabilizing legs attached to the frame for engaging the container top, hook engaging links attached to said frame, and operating means for engaging and disengaging said links.

2. The invention of claim 1 characterized by the further fact that said frame is composed of a single longitudinal member having stabilizing legs of a sufficient length to take the weight of the frame when properly centered.

3. The invention of claim 1 characterized by the further fact that said operating means consists of an operating rod revolvably mounted on said frame and extending outwardly to a point clear of an engaged container, struts attached to said frame for supporting the outer end of said rod, an operating lever integrally attached to the inner end of said rod, connecting rods connecting the ends of said lever to the links, a toggle spring attached to said lever and said frame urging said links either to the engaged or to the disengaged position and a control lever integrally attached to the outer end of said rod.

FREDERICK K. FILDES.