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LIFTING AND TRANSPORTING APPARATUS

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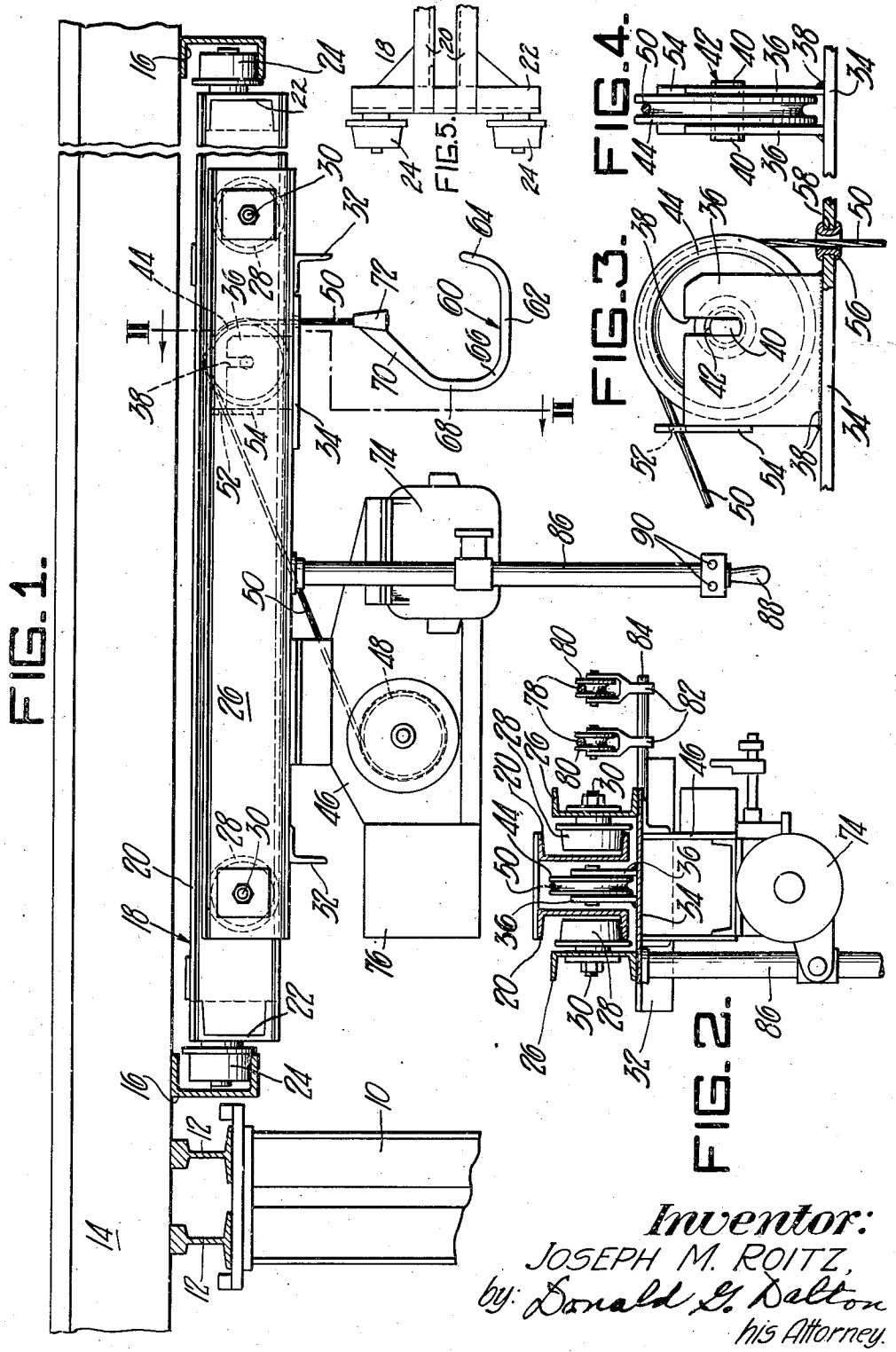


FIG. 1.

FIG. 5.

FIG. 3.

FIG. 4.

FIG. 2.

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LIFTING AND TRANSPORTING APPARATUS

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4 Claims. (Cl. 212—21)

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This invention relates to features of design and arrangement of the component parts of load lifting and transporting apparatus, so as to make it possible to handle loads with facility, in locations having a minimum amount of head room.

The invention will be fully apparent from consideration of the following detailed specification when read in connection with the accompanying drawings, in which:

Figure 1 is a vertical sectional elevation of a traveling crane equipped with a low head room trolley riding on the girders thereof.

Figure 2 is a transverse section on line II—II of Figure 1.

Figure 3 is a fragmentary detail showing the mounting for the guide sheave for the load carrying rope of the apparatus.

Figure 4 is an elevation from the right of Figure 3.

Figure 5 is a plan view of one end of the traveling crane.

Referring in detail to the drawings, reference numeral 10 represents any conventional form of column-supporting longitudinal beams 12 which in turn support cross beams 14. Suitably supported by the cross beams 14 is a pair of crane track rails 16 which in the example illustrated are in the form of channel bars. A traveling crane, indicated as a whole at 18, includes a pair of parallel channel-shaped girders 20 having a respective head 22 at each end thereof, each head carrying two wheels 24, as shown in Figure 5, which ride on the respective lower flanges of the crane tracks 16, as shown in Figure 1.

Paralleling the crane girders 20 and located on the opposite sides thereof is a pair of trolley side frames 26—26 which, as shown, are in the form of channel bars whose flanges extend outwardly. Each trolley side frame carries near its end a wheel 28 mounted on suitable axles 30. The wheels are flanged as shown, and their treads ride on the lower flanges of the crane girders 20. The side frames 26—26 are tied together by cross members 32 in the form of angle bars and also by a bottom plate 34. The relative proportions of the parts are such that the cross members 32 and bottom plate 34 just clear the under side of the crane girders 20—20.

Sheave bearing plates 36—36 are welded as at 38 or otherwise secured to the bottom plate 34, and said bearing plates 36 project upwardly into the space between the crane girders 20—20. The bearing plates as shown in Figure 3 are formed with slots 38 open at the top and adapted to receive the flattened ends 40 of a trunnion pin 42 which rotatably supports a guide sheave 44.

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A hoist-supporting sub-frame, indicated as a whole at 46, is secured to the lower portion of the side frames of the trolley, and this sub-frame structure rotatably supports a hoisting drum 48 having a load-lifting cable 50 wrapped thereabout and suitably secured at its end. The hoisting rope 50 passes through a guide opening 52 formed in a guide plate 54 secured to the sheave bearing plates 36, the rope then being reeved around the guide sheave 44 and passing through the eye of a guide bushing 56 seated in a suitable aperture 58 in the bottom plate 34. At its free end the rope is secured to a load-engaging hook indicated as a whole at 60. This hook is especially shaped to minimize head room by the provision of a substantially straight horizontal portion 62 having an upwardly curved extremity 64. At the point opposite the end 64 the hook curves upwardly at 66 and merges into a vertical portion 68 which connects with an oblique portion 70 which terminates in a shank 72 having a suitably flared socket formed therein for receiving the free end of the rope 50.

It is contemplated that in some cases where there is very little head room, the guide bushing 56 may be eliminated and the hole 58 may be made of sufficient diameter to permit the shank 72 of the load lifting hook to be pulled up part way through the bottom plate 34 to a point very close to the guide sheave.

The hoisting drum 48 is preferably power driven by means of an electric motor 74 connected through suitable reduction gearing of any conventional form (not shown in detail). A motor controller box 76 will be mounted on the sub-frame 46, and electric power will be transmitted by trolley wires 78—78 on which ride collector wheels 80—80 secured to trolley poles 82 mounted on suitable supporting means indicated at 84.

Depending from the under side of one of the side frames 26 is a handle bar 86 having a grip 88 on its lower extremity by means of which the trolley can be manually pushed lengthwise of the crane girders 20. Mounted on the handle bar are push buttons 90 for controlling the starting and stopping of the hoist motor 74 as well as its direction of travel, these push buttons and the electrical control in connection with the controller box being of a known type and not being specifically claimed herein and therefore not further illustrated.

From the foregoing description it is apparent

that due to the fact that the guide sheave **44** and its bearing plates **36** extend up into the space between the girders **20—20** of the traveling crane, it is possible to accommodate all the necessary parts of the load lifting apparatus in locations where very little head room is available.

While I have shown and described a specific design and arrangement of parts which an actual reduction to practice has demonstrated to be very effective, it is to be understood that I am not limited to the precise details illustrated, since various modifications and substitutions of equivalents may be made by those skilled in the art without departure from the invention as defined in the appended claims.

I claim:

1. Load lifting and transporting apparatus comprising a traveling crane including a pair of spaced girders supported at each end by respective wheels traversing a supporting track, a trolley including side frame members carrying wheels riding on track portions of said girders, a bottom member secured to and spanning the space between said side frame members and located close to and below the bottom of said girders, sheave bearing plates secured to said bottom member and extended up between said girders, a sheave rotatably supported by the bearing plates, and mechanism including a hoisting drum carried by said trolley having a lifting rope connected thereto which is reeved over said sheave, and a load engaging member secured to the free end of said rope below said sheave.

2. Load lifting and transporting apparatus comprising a traveling crane including a pair of spaced girders having parallel webs with oppositely extending flanges on the lower ends thereof and having a head portion at each end carrying wheels traversing a supporting track, a trolley including parallel side frame members adjacent the girders and having wheels riding on the lower flanges of said girders, a bottom member secured to and spanning the space between said side members and spaced slightly below the lower faces of the girder flanges, upright bearings rising

from said bottom member supporting a journal pin, a sheave mounted on said pin, a hoisting drum carried by said trolley having a lifting rope secured thereto which is reeved over said sheave, and a load engaging member secured to the free end of said rope below said sheave.

3. Load lifting and transporting apparatus comprising a traveling crane including a pair of spaced girders having parallel webs with oppositely extending flanges on the lower ends thereof and having a head portion at each end carrying wheels traversing a supporting track, a trolley including parallel side frame members adjacent the girders and having wheels riding on the lower flanges of said girders, a bottom member secured to and spanning the space between said side frame members and spaced slightly below the lower faces of the girder flanges, upright slotted plates secured to said bottom member and projecting up into the space between said girders, a journal pin having flattened extremities removably engaging said slotted plates, a guide sheave rotatable on said pin, a hoisting drum carried by said trolley having a lifting rope secured thereto which is reeved over said sheave, and a load engaging member secured to the free end of said rope below said sheave.

4. The apparatus of claim 1, including guides through which the rope passes mounted in juxtaposition to said sheave mounted respectively by said bottom member and said sheave bearing plates.

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