May 10, 1949. F. W. COFFING 2,470,019

COMBINATION HOIST, JACK, AND WIRE STRETCHER

Filed Dec. 12, 1947

FIG. 1

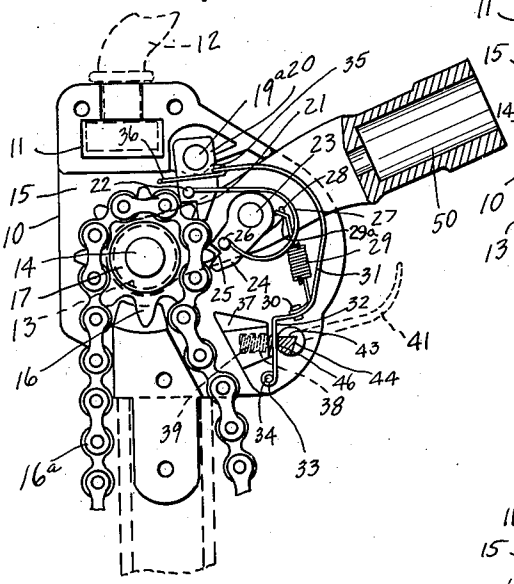


FIG. 2

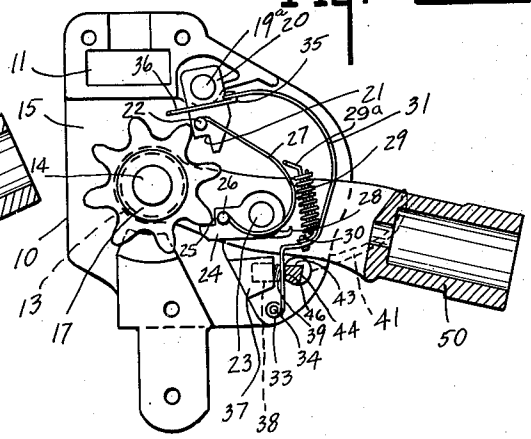


FIG. 3

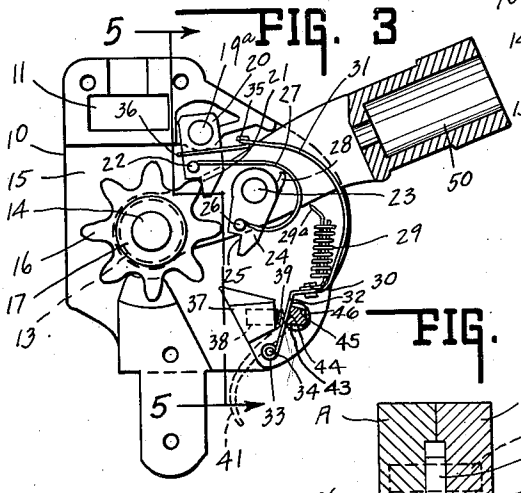


FIG. 4

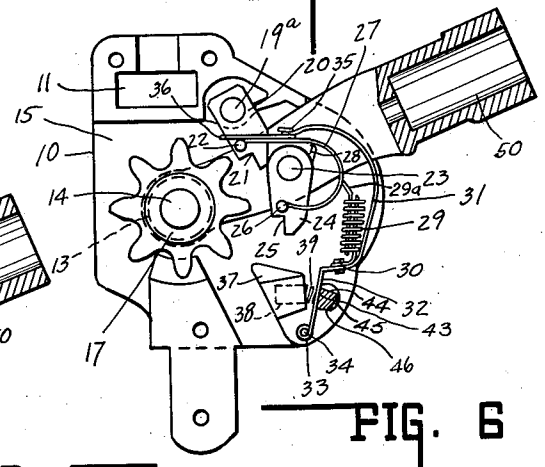


FIG. 5

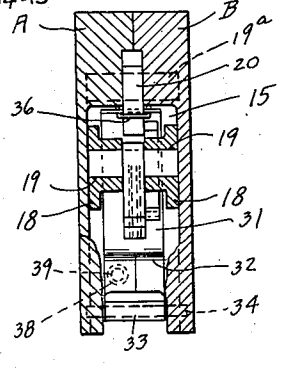


FIG. 6

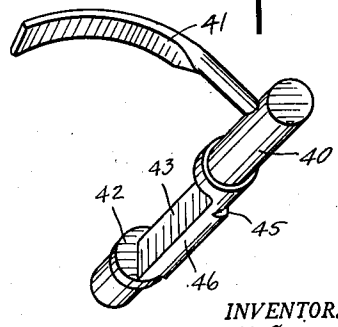
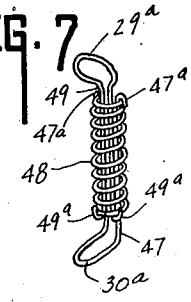


FIG. 7



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COMBINATION HOIST, JACK, AND WIRE STRETCHER

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Application December 12, 1947, Serial No. 791,333

4 Claims. (Cl. 74—156)

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This invention relates to a free chain, combination hoist and wire stretcher of the general type shown in Patent No. 2,377,324 dated June 5, 1945.

It also constitutes an improvement upon the copending applications Serial No. 568,948, now Patent No. 2,457,002, and 597,165 filed December 30, 1944 and June 2, 1945 respectively. The last mentioned discloses various uses of the structure generally designated by the term hoist. The former application discloses two semi-nested C-springs, an operating handle, a pair of cooperating pawls, a chain sprocket, and a control structure, manually operable to effect loading or reverse or permit free chain operation of a load chain, one of the pawls being oscillatable with the handle. The present invention is more specifically an improvement upon that disclosed in the first mentioned application and may be used as disclosed in the second mentioned application.

The chief object of the present invention is to simplify the construction of such a hoist and to render its operation and use foolproof.

The chief feature of the present invention resides in the selectively operable manual control member and the parts immediately associated therewith.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawing—

Fig. 1 is a central elevational view of the preferred embodiment of the invention, parts being shown in the load "elevating" position, the operating handle being shown in the "up" position, one half of the housing being removed.

Fig. 2 is a similar view of the same parts, the handle being shown in the "down" position.

Fig. 3 is a similar view of the same parts, the parts being shown in the load "lowering" position, the handle being shown in the "up" position.

Fig. 4 is a similar view of the same parts, the parts being shown in the "free chain" position and the handle being shown in the "up" position.

Fig. 5 is a vertical sectional view taken on line 5—5 of Fig. 3 and in the direction of the arrows.

Fig. 6 is a perspective view of the control member.

Fig. 7 is a perspective view of a tension structure embodied in the invention.

Herein the terms "up" and "down" are employed in a relative sense; likewise the terms "lifting" and "elevating" relative to "lowering."

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"Free-chain" is used in the accepted sense, to wit the chain, with no load thereon, can be freely pulled through the hoist in either direction to effect rapid initial approximate adjustment of said chain.

Since Patent No. 2,377,324 discloses broadly a hoist of the general character herein disclosed, and the operation of same is given in great detail as well as the description of parts, but brief reference will be had herein to that which is common to said patented structure.

Two complementary castings A and B, see Fig. 5 comprise a housing 10, see Figs. 1 to 4, chambered at 11 to swivel mount a hook 12, see Fig. 1. The aligned bosses 13 rotatably support shaft 14 which extends across chamber 15. Rotatable upon said shaft is the sprocket gear 16 having oppositely directed hubs 17.

Straddling said gear, see Fig. 5, are the arms 18 apertured at 19 to take said shaft 14. A sprocket chain 16a meshes with sprocket gear 16, see Fig. 1, and the teeth of the latter project through the chain as shown.

Mounted on shaft 19a is pawl 20 having a notched end 21 as shown and carrying a pin 22. The two arms 18 shown in the Fig. 5, also consist of a part of casting 50 and mount a shaft 23 which extends across the gap between said arms. On said shaft is mounted pawl 24 having notched end 25. This pawl also carries a pin 26. A C-shaped spring 27 is mounted at opposite ends upon said pins 22 and 26.

Pawl 24 also includes hook portion 28 to which may be attached one end of a yielding or tension structure 29 anchored as at 30 to the second main spring 31. The hook engageable end of said structure comprises a large loop 29a, see Fig. 7, so that in handle oscillation and consequent pawl 24 oscillation, when the hoist is properly conditioned, the hook 28 engages in loop 29a and the yielding structure is effective, whereas when otherwise conditioned it is not effective, compare Fig. 1 and Figs. 2, 3 and 4 respectively.

The second main spring 31 is generally C-shape and includes offset portion 32 and eye portion 33 forming an anchorage for one end of said spring 31 by means of pin 34. The other end of said spring is disposed adjacent pawl 20 and is apertured to take the hook shaped ends 35 of a U-shaped anchor 36 that straddles said pawl 20 as shown in Figs. 1 to 5.

In a boss 37 is a bore 38 in which is disposed a coil spring 39, the exposed end of which bears at all times upon the portion 32 of spring 31. Oscillatably supported by the housing upon the

opposite side of said spring portion is member 40 having on its housing exposed end finger piece 41, see Fig. 6. This member includes a notch 42 of a width to accommodate spring portion 32. This notch has two substantially transverse root faces 43 and 44, see Figs. 1 to 4. This member also has an arcuate portion 45 and a flat face 46. Face 43 is provided for free chain disposition, see Fig. 4. Face 44 is provided for load lowering control, see Fig. 3. Face 46 is provided for load elevation control, see Figs. 1 and 2.

The two arms 18 are joined to form integral socket 50 for reception of an extension element not shown. With finger piece 41 positioned as shown in Figs. 1 and 2 the hoist is conditioned for lifting. Oscillation of handle 18—50 effects clockwise advance of sprocket 16 for chain advance. In this operation, yielding structure 29 is so disposed by the manual control, through spring portion 32 that, as the handle moves upwardly, hook 28 engages in loop 29a and the structure 29 is extended to the end of arm upward travel. This structure positively forces pawl 24 into engagement with tooth of sprocket 16. Then pulling down on handle 18—50 rotates sprocket 16 clockwise which lifts load until pawl 20 engages the next tooth on sprocket 16 and holds the load until lever 18—50 is moved upwardly to repeat another step of the operation. Near the lower end of the arm travel the hook 28 leaves the loop 29a and then upon handle reversal reengages the loop 29a for the purpose described.

In load lowering, see Fig. 3, or in free chain operation, see Fig. 4, the structure 29 is not effective nor is it disposed for loop 29a engagement by hook 28 in the oscillation of handle 18—50.

The structure 29, see Fig. 7, specifically includes a U-shaped wire member 49 with spring anchoring ends 49a and intermediate loop portion 29a. Coiled thereabout is spring 48. Within spring 48 is the U-shaped wire member 47 with spring anchoring ends 47a and midportion 30a which is anchored by rivet 30 to spring 31, see Figs. 1 to 4. Structure 29 accordingly is yieldable longitudinally, but does not pivot or oscillate when released from hook 28. It can, however yield laterally, as it were, as required, compare Fig. 1 with Figs. 2 to 4 inclusive.

The foregoing detailed description is to be considered illustrative of the invention and in no sense restrictive in character.

The invention claimed is:

1. In a hoist having a toothed member rotatable in opposite directions for lifting and lowering purposes, a pair of notched end pivoted pawls having selective engagement with the toothed member, an oscillatable handle, means operatively connecting the handle and pawls, and a selective manual control rendering the hoist effective for different purposes, the combination therewith of a hook upon one of the pawls and a yielding structure relatively stationarily anchored at one end and provided at another end with a loop, the loop being disposed contiguous to the hook for selective engagement therewith only when the handle is oscillated and when the hoist is conditioned for one type of operation.

2. A hoist as defined by claim 1 wherein the means connecting the handle and pawls comprises a pair of springs, one spring being connected at opposite ends to the pawls, the other spring having selective engagement at one end with one of the said pawls, and relatively stationarily anchored at the other end, the one end of said anchored structure being anchored to said last mentioned spring adjacent its relatively stationarily anchored end.

3. A hoist as defined by claim 2 wherein the selective manual control is disposed contiguous to said last mentioned other spring adjacent its relatively stationarily anchored end and the yielding structure anchorage thereto and between the same.

4. A hoist as defined by claim 3 wherein another spring is disposed contiguous to the manual control associated portion of the before mentioned said other spring and is normally opposed to the effect of the manual control thereon.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
583,785	Brown	June 1, 1897
2,377,324	Coffing	June 5, 1945