May 31, 1949. F. W. COFFING 2,471,726

JACK OPERABLE AND SUPPORTED VISE

Filed April 12, 1946 2 Sheets-Sheet 1

FIG. 1

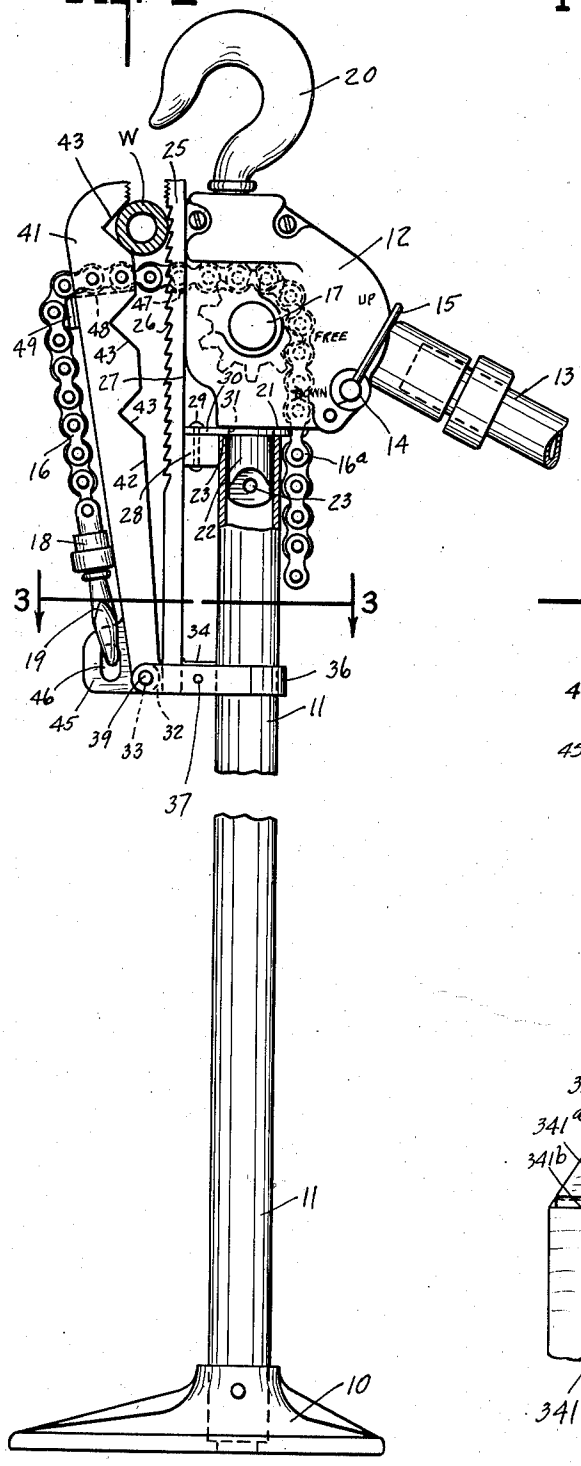


FIG. 2

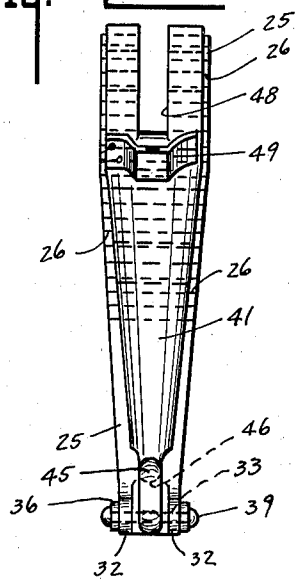


FIG. 3

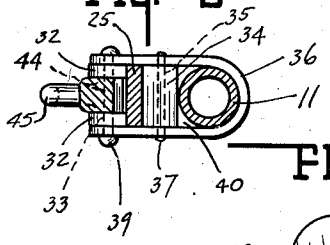


FIG. 4

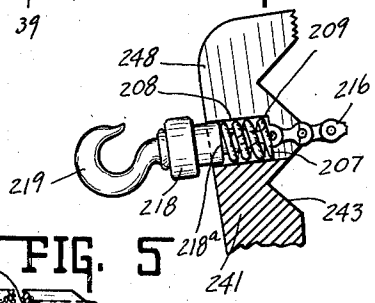
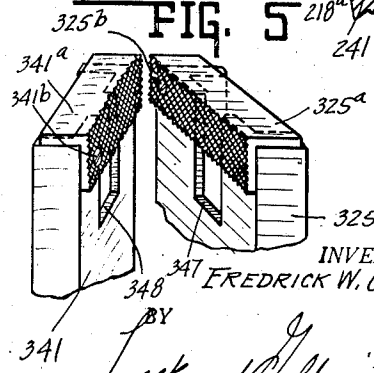


FIG. 5



INVENTOR.
FREDRICK W. COFFING.

BY

Lockwood, Goldsmith & Galt,

ATTORNEYS.

May 31, 1949. F. W. COFFING 2,471,726

JACK OPERABLE AND SUPPORTED VISE

Filed April 12, 1946 2 Sheets-Sheet 2

FIG. 6

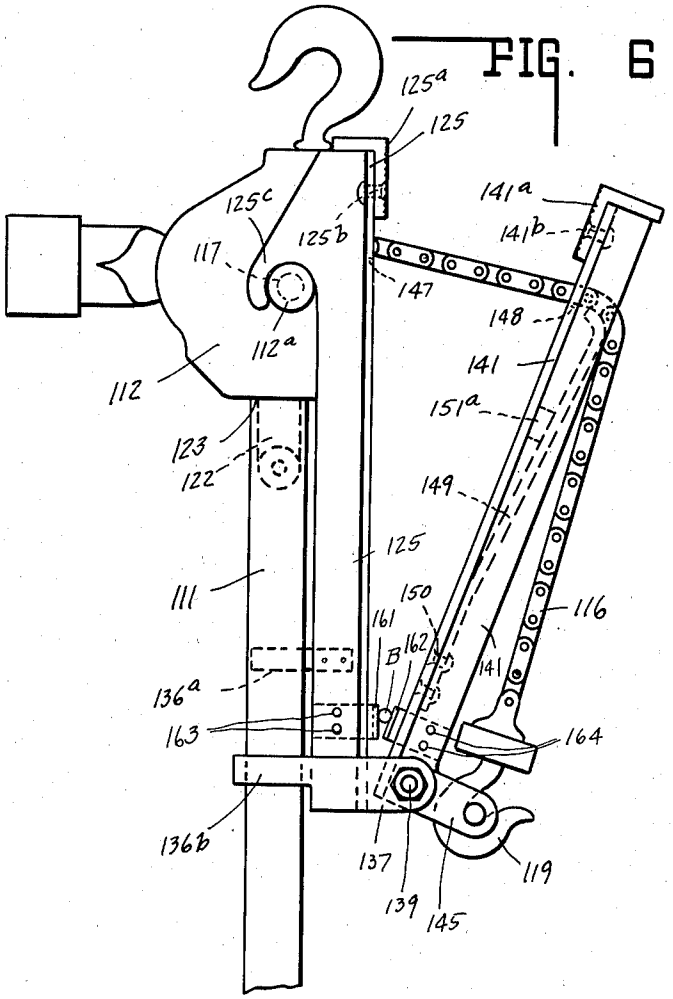
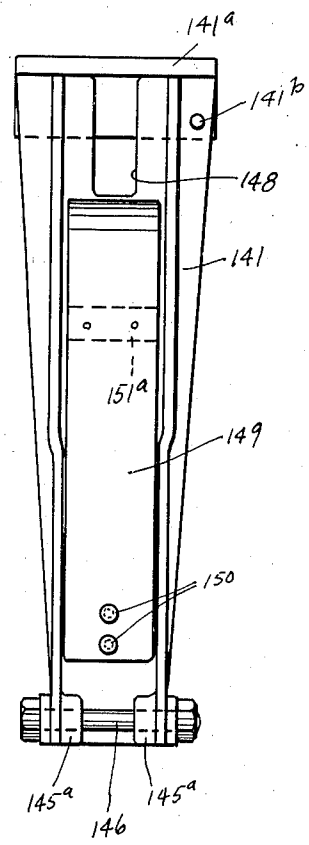


FIG. 7



INVENTOR.
FREDRICK W. COFFING,
BY
Lockwood, Goldsmith & Galt,
ATTORNEYS.

Patented May 31, 1949

2,471,726

UNITED STATES PATENT OFFICE

2,471,726

JACK OPERABLE AND SUPPORTED VISE

Fredrick W. Coffing, Danville, Ill., assignor to Coffing Hoist Company, Danville, Ill., a corporation

Application April 12, 1946, Serial No. 661,734

15 Claims. (Cl. 81—21)

1

This invention relates to a vise structure.

The chief object of this invention is to provide a standard supported hoist with vise forming means which are associated with parts of the hoist for vise support and operation.

The chief feature of the present invention resides in utilizing the flexible inextensible means (chain, cable and the like) of a hoist as the vise power means.

Another feature of the invention resides in the slotting of the jaw members at the clamping portions thereof for flexible inextensible means accommodation and a slot closure for same if, as and when desired.

A further feature of the invention resides in the semi-yielding type bearing for the aforesaid means whereby proper clamping can be effected despite the step by step adjustment of said means.

Still a further feature of one embodiment of the invention resides in interposing between separable standard and hoist a portion of the vise for anchorage and support purposes.

The hoist herein employed is of the so-called "free chain" type, hence rapid jaw adjustment can be effected for opening and initially closing same and the chain embodiment is movable step by step in effect.

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

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

In the drawings Fig. 1 is a side elevational view of a standard supported hoist with the invention operatively associated therewith and a piece of work included therein, the work being shown in section and parts of the standard being broken away to show the same in section and other parts in elevation.

Fig. 2 is a front elevational view of the vise portions of the invention.

Fig. 3 is a transverse sectional view taken on line 3—3 in Fig. 1 and in the direction of the arrows but omitting the hook of the hoist chain.

Fig. 4 is a central sectional view of a modified form of movable jaw and cushion structure.

Fig. 5 is a perspective view of the upper ends of channel type jaw members equipped with slot closures, the members being spaced apart or separated to simultaneously expose the inside faces thereof.

Fig. 6 is a side elevational view of a modification, which is the preferred form of the invention.

Fig. 7 is a front view thereof.

2

In Figs. 1 to 3 of the drawings there is conventionally illustrated a standard supported hoist of the separable type. In Fig. 1, 10 indicates a suitable base or foot, 11 a tubular standard, 12 a hoist body oscillatably supporting a handle structure 13. Carried by the hoist body 12 is an oscillatable means 14 which, when positioned so that an arm portion 15 is directed upwardly and to the right, conditions the hoist for elevational movement of the chain 16.

When the member 15 is directed upwardly and to the left for registration with the legend "Free," the hoist is conditioned for free chain movement in either direction providing there is no load on the chain.

When the arm portion 15 is directed oppositely from the position shown in Fig. 1, that is toward the "Down" legend, then the hoist is conditioned for load lowering chain movement.

Pumping of the handle 13 up and down with the member 15 in either the up or down position will effect chain movement in accordance with that determined by the position of the arm 15.

The chain 16 is associated internally with a sprocket carried by the shaft 17 supported by the hoist body 12, and the chain passes from the hoist body as at 16a. The operating end of the chain terminates in a connector 18 mounting a swivel hook 19.

The hoist body may have a swivel hook 20 for suspension of the hoist. The hoist body terminates in a shoulder 21, and extending downwardly therefrom is the portion 22 having the aperture 23 therein, the purpose of the latter being to facilitate reeving when desired. However, herein the projection 22 seats in the upper tubular end of the standard 11, and normally the shoulder 21 bears upon the upper end 23 of the standard.

One form of this standard supported hoist is fully disclosed in the co-pending application Serial No. 597,165, filed June 2, 1945, and entitled Combination hoist, jack, and wire stretcher.

For the purpose of understanding the present invention it need only be said that extensible means which advance in the load elevating direction is utilized for vise jaw movement, and since the extensible means is advanced in step by step manner it will be appreciated that the advance of the movable jaw is correspondingly of step by step character to the extent that the extensible means similarly advances.

Reference will now be had to Figs. 1, 2 and 3. Herein is illustrated a stationary jaw 25 and an appreciable portion thereof is serrated as at 26.

The opposite face 27 is arranged to bear upon the hoist 12.

Approximately midway between the top and the bottom of the member 25 there is provided a rearward extension 28, and suitably secured thereto as at 29 is a plate 30 with an aperture 31 therein. The size of this aperture is that necessary to pass the projection 22.

The position of this aperture in the plate is determined by the relationship of the bearing face 27 to the tubular standard so that the aperture 31 does register with the tubularity of the socket thus provided at the top of the standard 11.

It will be observed, that if the hoist is detached from the standard and the jaw 25 be applied to the hoist with the plate 30 interposed between the hoist and the standard, that the projection 22 will lock the comparatively stationary jaw 25 rigidly in position with respect to the standard and the hoist.

The lower end of the member 25 is provided with a forward extension in the form of spaced ears 32 apertured at 33 and a rearward extension 34 apertured at 35. A U-shaped strap 36 is rigidly secured by member 37 to opposite sides of the bearing or spacing member 34 and the strap is secured to the ears 32 by the transverse member 39 in apertures 33. Such dual anchorage of the strap prevents tilting thereof relative to the jaw member 25 and provides a socket indicated generally by the numeral 40 for reception of the standard 11.

Now when the vise is utilized, the hoist and movable jaw are disassociated as aforesaid and the U-shaped strap 36 is presented to the upper end of the standard 11 and telescoped thereon. All is then lowered until the projection 22 of the hoist body nests within the upper end of the tubular standard, the portions 34 and 28 serving as spacers to provide rigid mounting for said stationary jaw member 25.

The movable jaw member is indicated by the numeral 41 and the same on its face 42 confronting the serrated face 26 of the stationary jaw member is V-notched as at 43. The lower end of said member is apertured as at 44 and receives the member 39, which is supported by the straddling ears 32, and which serves as a pivot or fulcrum for the lever type jaw member 41.

Extending forwardly from the lower end of the movable jaw member is the portion 45 which is provided with aperture 46 to which is detachably engaged the hook 19 on chain 16.

The stationary jaw 25 is notched as at 47 and the movable jaw or lever 41 is notched at 48, and these notches are of such a depth that, when the vise is applied to the jack and standard, the notches register with the intake opening or throat of the hoist body wherein is positioned the chain 16.

Now when the work W is applied to the vise, the chain being nested in the two aligned notches or slots 47 and 48, said chain lies below the work and the clamp is effected between the upper portions of the two jaw members 25 and 41.

As previously set forth, the chain is advanced step by step. Consequently, there is herein provided means for insuring positive clamping with a predetermined pressure when the final clamp position of the movable jaw is intermediate, as it were, in the step to step interval.

Such means is herein disclosed as comprising a U-shaped stiff spring member 49, or other type cushion, to the movable member 41 immediately adjacent the notch 48 therein. This provides enough "give" for accommodation inherent in this spring to insure proper clamping pressure through the chain whenever the clamping position of the movable jaw corresponds to what might be termed an intermediate position of the chain with respect to its step by step position.

The movable jaw, shown in Figs. 1 and 2 more particularly, is a lever of the first class and is of bell crank type.

In Fig. 4 a modified form of the invention is illustrated. Herein 241 indicates the movable jaw slotted as at 248 and notched as at 243. The chain 216 herein is enveloped near hook 219 by a coil spring 209 bearing at one end upon the end 218a of hook mount or connector 218.

Herein the jaw 241 is recessed at 208 for a sufficient distance from the rear face to accommodate a portion of connector 218 as well as spring 209, the latter at its other end bearing on bottom portions 207 of the recess as shown. The diameter of said recess is sufficient to take the spring and the immediately adjacent end of connector 218.

The resistance of this spring is such that for normal clamping operation it may yield but little. However, whenever desired or required it will compress permitting end 218a to further advance in said recess toward face 207 when the step interval requirements necessitate such advance.

The jaw closing force usually is applied to the jaw 241 through the bottom portions of recess 208 except when the enlarged portion of connector 218 engages the outer face of jaw member 241.

Reference will now be had to another embodiment of the invention which is illustrated in Fig. 5, wherein both jaw members 341 and 325 are shown as channel sections. These are slotted at 348 and 347 respectively. Angle caps or heads 341a and 325a are pivoted on the jaw members at 341b and 325b and when the caps are seated the same bridge the slots 348 and 347 respectively.

The confronting faces of the caps may be knurled, as illustrated, or otherwise formed. Note that the pivots 341b and 325b are oppositely disposed, as it were, one on one side of the jaw and the other on the opposite side of the opposite jaw. The purpose thereof is to prevent cap creeping or tilting upwardly when and while clamping pressure is being applied.

In Figs. 6 and 7 the preferred form of the invention is illustrated and numerals of the one hundred series designate parts like or similar to those shown in Figs. 1 to 3 and designated by corresponding numerals of the primary series.

The standard 111 has open upper end 123 receiving projection 122 on hoist body 112 which body includes bosses 112a at opposite sides seating opposite ends of sprocket or drum shaft 117 if of chain or cable type respectively.

Stationary jaw 125 is of channel type and is notched and capped as at 125a at the upper end in substantially the same manner as illustrated in Fig. 5. Jaw 125 herein includes opposite hook portions 125c which hook over bosses 112a.

This jaw has longitudinally-spaced lower-end mounted curved arms 136a and 136b which are oppositely disposed and spaced sufficiently to pass the standard 111 when angularly presented thereto. Thus after such presentation, the jaw is aligned with the hoist and standard and lowered to associate the bosses and the hooks. This constitutes the vice anchorage or general support.

The movable jaw member 141 is of channel form and has its upper end slotted and capped as at 141a in a manner similar to that illustrated in

Fig. 5. Nested in the movable jaw and secured thereto as at 150 is the longitudinally and upwardly directed spring 149, same bearing on fulcrum 151a.

Projecting forwardly from the lower end of jaw member 125 are the ears 137, same straddling the lower end of the movable jaw member 141 and pivotally supporting same on pivot pin 139.

Spaced ears 145 carried by the lower end of the movable jaw member 141 are offset inwardly towards each other as at 145a and mount pin 146, same being engageable by hook 119 carried by chain 116 which bears upon the upper end of spring 149 and passes through the slots or notches 147—148 in the upper ends of the jaw members.

Operation of this form of the invention is substantially that previously described relative to the embodiment illustrated in Figs. 1 to 3. The preferred form is illustrated as of separable hoist and standard type but obviously separation herein is an incidental feature for both may be rigidly connected together.

In Fig. 6 only there is illustrated a pair of shearing or cutting members 161 and 162 secured as at 163 and 164 to members 125 and 141 respectively for bolt, etc., cutting or shearing purposes. B indicates such a bolt.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In combination with a hoist structure including a body portion, an inextensible flexible means such as a cable, chain and the like, power transmitting mechanism incorporated in the body portion for moving the flexible means therethrough, and a tubular standard detachably supporting the body portion; a detachable vise structure comprising a stationary supporting member for a vise jaw, a movable supporting member for a vise jaw, means mounting said movable member on said stationary member, means for connecting the flexible means to the movable member, the flexible means extending from said connecting means and passing through both members and into the body portion, and vertically spaced means rigidly and detachably connecting the stationary member to the body portion and standard.

2. Structure as defined by claim 1 wherein said movable member mounting means comprises a pivotal connection between lower ends of the members, and the members being positioned alongside and generally parallel to the standard.

3. Structure as defined by claim 2, said vertically spaced means having its lower means juxtapositioned to said lower ends for detachably securing the same to the standard in spaced relation, and having its upper means engaging said body portion.

4. Structure as defined by claim 1 wherein a yielding means is operatively interposed between the movable member and the flexible inextensible means.

5. Structure as defined by claim 1 wherein said vertically spaced connecting means includes an apertured plate, and wherein the standard is provided with a socket at its upper end and the body portion is provided with a projection seating in said socket, said plate being interposed between the standard and body portion, so that said projection passes through the plate aperture.

6. Structure as defined by claim 1 wherein upper portions of the members have elongate and medially located notches for seating the flexible means.

7. Structure as defined by claim 6, and spring means mounted on said movable member adjacent its notch, said spring means being engageable by said flexible means.

8. Structure as defined by claim 1 wherein said movable member mounting means comprises a pivotal connection between lower ends of the members, the members being positioned alongside and generally parallel to the standard, each member being channel-shape in transverse section and having a cap member pivotally mounted on an upper end thereof.

9. Structure as defined by claim 1 wherein an upper portion of each member is provided with an open-end and medially located notch for accommodating said flexible means, and a cap mounted on each upper portion for closing the entrance to each notch, said cap means also providing confronting clamping faces.

10. Structure as defined by claim 9 wherein each member is made channel-shape in transverse section, and each cap comprises a transversely disposed angle member pivotally mounted on its supporting channel.

11. Structure as defined by claim 1 wherein said movable member mounting means comprises a pivotal connection between lower ends of said members, said members being positioned alongside and generally parallel to the standard, each member being channel-shape in transverse section and having a cap pivotally mounted at one end on an upper end of the member, each cap being L-shaped in transverse section, the two pivotal axes of the caps being oppositely disposed relative to a longitudinal centerline of each channel-shape member.

12. Structure as defined by claim 1 wherein the means connecting the flexible means and movable member includes an enlargement at the member engaging end of said flexible means, and a coil spring surrounding the flexible means and positioned between the movable member and said enlargement to serve as a yielding bearing.

13. Structure as defined by claim 12 wherein the movable member is provided with a recess to house and seat the coil spring.

14. Structure as defined by claim 13 wherein upper ends of the movable and stationary members are each provided with a medially located notch, the notch in the movable member communicating with said recess.

15. Structure as defined by claim 1 wherein the members are made channel-shape in transverse section, an upper portion of each member being provided with an open-end and medially located notch for accommodating said flexible means, an L-shape cap being provided for each upper portion and closing the entrance to each notch, said caps providing confronting clamping faces and being pivotally mounted at one end on the members, the two pivots being disposed on opposite sides of the aligned notches.

FREDRICK W. COFFING.

(References on following page)

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
286,995	Boyce	Oct. 23, 1883
367,658	Oliver	Aug. 2, 1887
377,976	Babcock	Feb. 14, 1888
434,231	Babcock	Aug. 12, 1890
594,314	Babb	Nov. 23, 1897
1,253,725	Rahfeldt	Jan. 15, 1918
2,377,324	Coffin	June 5, 1945

FOREIGN PATENTS

Number	Country	Date
313,018	Germany	June 24, 1919
650,743	France	Sept. 25, 1928