Nov. 13, 1956 O. E. DOTSON 2,770,339

LEVER HOIST

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FIG. 1

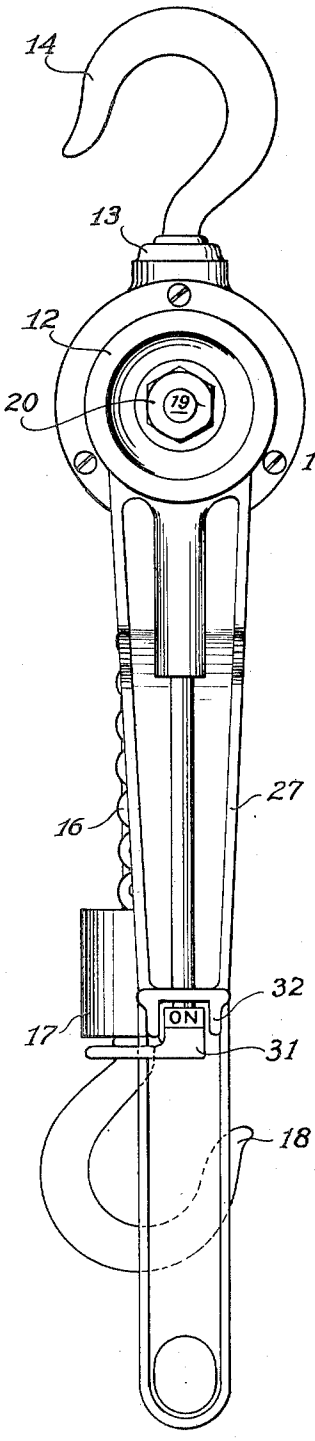


FIG. 2

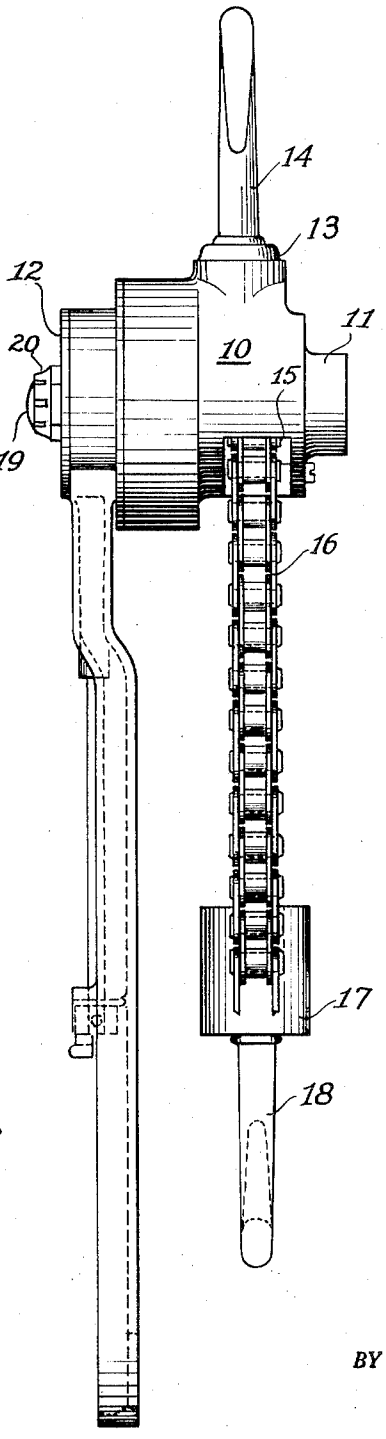
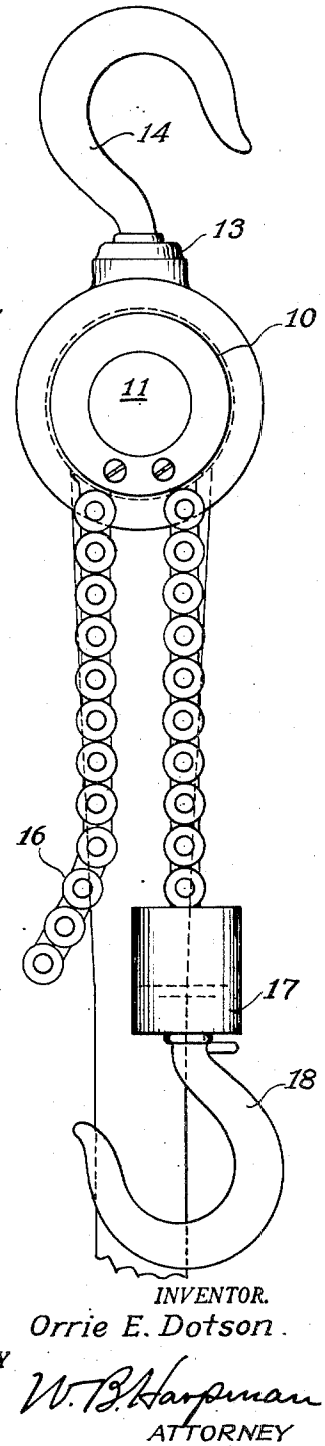


FIG. 3



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FIG. 4

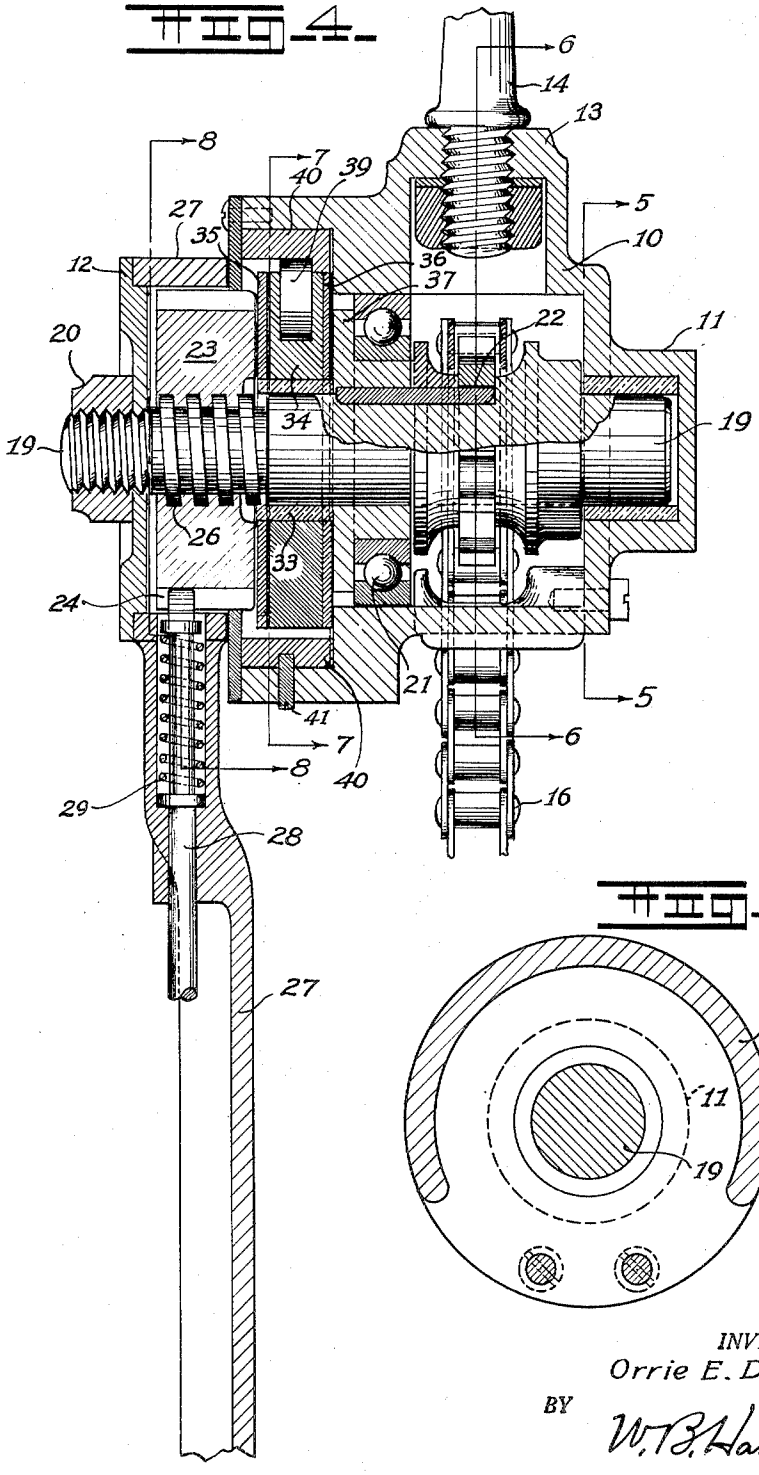


FIG. 5

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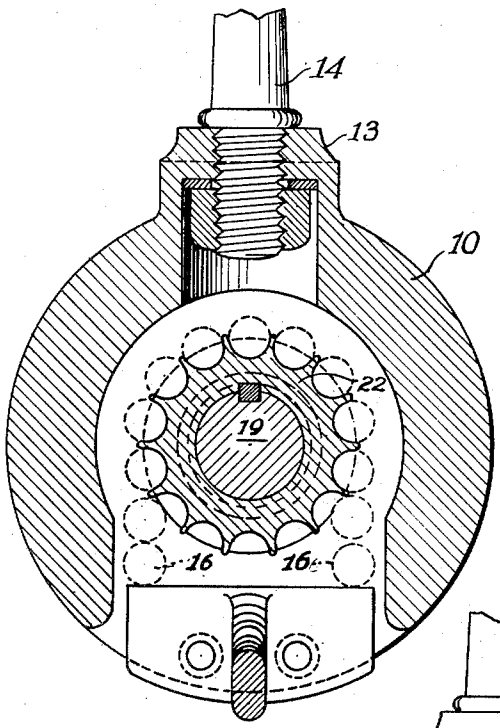


FIG. 6

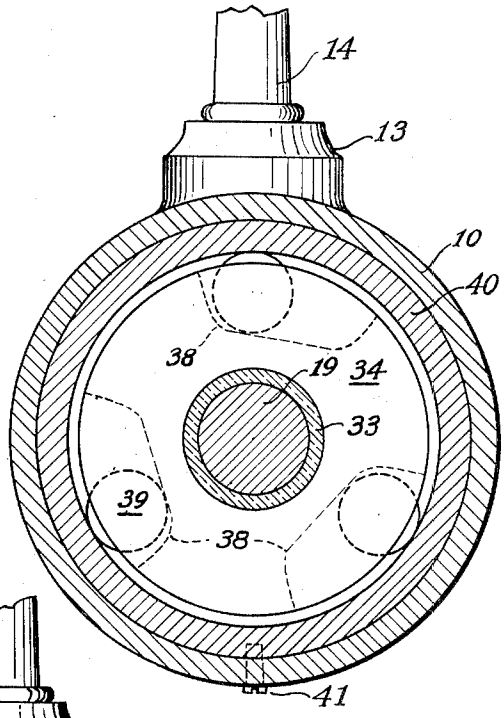


FIG. 7

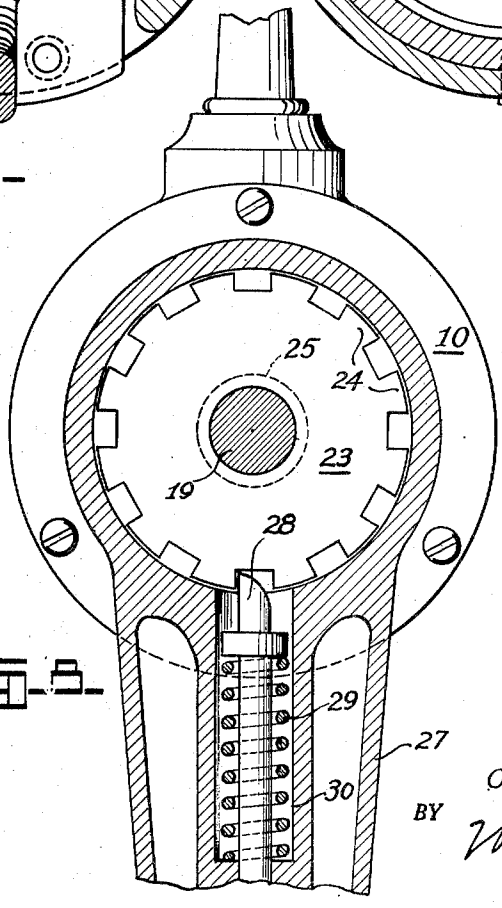


FIG. 8

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2,770,339

LEVER HOIST

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Application March 30, 1953, Serial No. 345,656

5 Claims. (Cl. 192—16)

This invention relates to a hoist and more particularly to a lever hoist.

The principal object of the invention is the provision of a lever hoist capable of advancing and holding the tensioning element thereof in any desired degree.

A further object of the invention is the provision of a lever hoist of relatively simple construction incorporating a novel clutch and brake means.

A still further object of the invention is the provision of a lever hoist of lightweight, compact construction capable of being used for tightening cables and the like.

A still further object of the invention is the provision of a lever hoist which may be easily controlled and operated.

The lever hoist disclosed herein is particularly advantageously employed in lifting various objects relatively short distances and holding the same in desired position while the article is assembled into a machine or the like and wherein it is necessary to exactly control the vertical position of the article by moving it upwardly or downwardly a fraction of an inch.

Various lever hoists heretofore known in the art have had the common failing of inaccurate close adjustment specifically in that the article being lifted or pulled by the lever hoist could not be accurately posititioned within the area defined by the spacing of the ratchet teeth of the hoist which controlled the braking effect thereof. On the contrary, in the present invention minute upward or forward adjustments may be made and minute down or backward adjustments are equally easily accomplished enabling a most precise location of an article to be realized through the use of the lever hoist.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being the invention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is an end view of the lever hoist.

Figure 2 is a side view of the lever hoist.

Figure 3 is an opposite end view of the lever hoist with respect to Figure 1 and with portions broken away.

Figure 4 is an enlarged sectional elevation of the lever hoist.

Figure 5 is a vertical cross section taken on line 5—5 of Figure 4.

Figure 6 is a vertical cross section taken on line 6—6 of Figure 4.

Figure 7 is a vertical cross section taken on line 7—7 of Figure 4.

Figure 8 is a vertical cross section taken on line 8—8 of Figure 4.

By referring to the drawings and Figures 1, 2 and 3

in particular it will be seen that the lever hoist comprises a body member **10**, the interior of which is hollow and one end **11** of which is of reduced diameter with the opposite end thereof defined by a plate **12**. A circular boss **13** is positioned on the upper portion of the body **10** and receives a hook **14**. Openings **15** in the lower portion of the body **10** and beneath the hook **14** provide entrance and exit passageways for a chain **16**, one end of which terminates in a swivel **17** carrying a secondary hook **18**.

The reduced end **11** of the body **10** forms a bearing for one end of a driven shaft **19** as may best be seen in Figure 4 of the drawings. The other end of the driven shaft **19** extends through the plate **12** and is engaged by a nut **20** threaded thereon and by means of which the plate **12** is maintained in position on the body **10**. An annular ball bearing assembly **21** positioned within the hollow body **10** serves to carry the middle portion of the driven shaft **19** at a point thereon adjacent a sprocket **22** over which the chain **16** is positioned. The chain **16** and the sprocket **22** form the means of conveying motion of the driven shaft **19** to the article to be moved.

Means for driving the driven shaft **19** comprises a member **23** which takes the form of a circular apertured disc with ratchet teeth **24** formed in its periphery. The aperture in the member **23** is provided with a thread pattern **25** which registers wtih a thread pattern **26** formed on the driven shaft **19**. There is sufficient area within the hollow body **10** to permit the member **23** to rotate in limited degree on the thread pattern **26**, which action causes it to move from right to left thereon, as seen in Figure 4 of the drawings.

In order that rotating motion may be imparted to the member **23**, a handle **27** is rotatably mounted on the body member **10** and retained in such position by the plate **12**, heretofore referred to. The handle **27** includes, in addition to the elongated handle portion and circular end section pivoting on the body member **10**, a longitudinally movable latch **28** spring urged toward the ratchet teeth **24** of the member **23** by a coil spring **29** positioned in a cutaway portion **30** of the handle member **27**.

The opposite end of the latch **28** has an offset secondary handle **31** thereon as may best be seen in Figure 1 of the drawings so that the latch **28** may be rotated on its longitudinal axis to move it into and out of engagement with the ratchet teeth **24** on the member **23** and to reverse its effective ratchet-like engagement with said ratchet teeth **24**.

The longitudinal movement of the latch **28** is occasioned by the presence of a pair of bosses **32** on the handle **27** adjacent the secondary handle **31**.

Positioned on the driven shaft **19** between the thread pattern **26** and the bearings **21** there is a sleeve **33** with a cam disc **34** rotatably mounted thereon and a pair of discs **35** and **36** positioned one each on either side of the cam disc **34**. The cam disc **34** and the discs **35** and **36** on either side thereof are positioned adjacent the inner face of the member **23** and so that upon its being moved into engagement with the same by rotation on the thread pattern **26** by the handle **27**, it will lock the assembly together by frictional engagement against an annular flange **37** on the driven shaft **19** so that motion imparted to the body member **23** will be conveyed through the frictional engagement of the discs **35**, **36** and the cam disc **34** with the flange **37** of the driven shaft **19** and the driven shaft **19** thereby revolved.

The cam disc **34** has a plurality of cam slots **38—38** therein with rollers **39—39** mounted in the cam slots. The cam slots are arranged as shown in Figure 7 of the drawings to permit the cam disc to move in only one direction as movement in the opposite direction causes the rollers **39** to move outwardly of the cam slots **38—38**

and into engagement with an annular ring **40** which is mounted within the hollow body member **10** and keyed thereto as by a pin **41**.

It will thus be seen that the driven shaft **19** with the sprocket **22** may be moved in one direction by corresponding movement of the member **23** as imparted to it by the handle **27** as the member **23** moves inwardly on the thread pattern **26**, engages the discs **34**, **35** and **36** and locks them tightly against one another and the flange **37** on the driven shaft **19** to convey rotary motion of the member **23** to the driven shaft **19** and the sprocket **22**. Thus, an article attached to the secondary hook **18** on the chain **16** will be moved toward the lever hoist in a lifting or tightening operation.

The cam disc **34** revolves during this action, the rollers **39** moving inwardly of the cam slots **38** and out of engagement with the annular ring **40**. Immediately such motion stops, and a reverse or opposite motion commences, the rollers **39** move outwardly of the cam slots **38** in the cam disc **34**, engage the annular ring **40** and lock the assembly thus securely holding the object on the hook **18** in any desired location or degree of tightness.

When it is desired to release the driven shaft **19** so that the sprocket **22** will permit the chain **16** to slacken and lower or release tension on an object attached to the hook **18**, the secondary handle **31** on the latch **28** is moved to reverse the position of the latch **28** so that the handle **27** may be used to move the member **23** away from the cam disc **34** and its adjacent discs **35** and **36** which will free the same from the driven shaft **19** thus leaving the driven shaft **19** free to revolve. As long as the latch **28** is engaged in the ratchet teeth **24** of the member **23**, the reverse motion of the driven shaft **19** will be directly controlled thereby.

If it is desired to permit the chain **16** and the hook **18** thereon to fall freely or move away freely from the lever hoist, then the latch **28** is completely disengaged from the ratchet teeth **24** and the member **23** is capable of rotating in the hollow body **10** along with the driven shaft **19**.

It will thus be seen that the several objects of the invention are met by the lever hoist disclosed herein.

Having thus described my invention, what I claim is:

1. In a lever hoist, a hollow body member having oppositely disposed aligned openings, a driven shaft located therein and journaled therein midway between said openings and in one of said openings a sprocket and an annular flange secured to said driven shaft and a thread

pattern formed on said driven shaft, said sprocket, annular flange and thread pattern positioned in spaced relation to one another, a cam disc rotatably positioned on said driven shaft between said annular flange and said thread pattern, and a secondary body member engaged on said thread pattern, an annular ring within said first mentioned body member about said cam disc and spaced with respect thereto, a plurality of cam slots formed in the periphery of said disc and a plurality of rollers located one in each of said cam slots for engagement with said annular ring when moved in one direction, means for rotating said secondary body member, said secondary body member being capable of limited rotation on said thread pattern on said driven shaft to engage said cam disc and move the same against said annular flange to move the driven shaft and sprocket in another direction.

2. The improvements in a lever hoist set forth in claim 1 wherein one of the oppositely disposed aligned openings in the body member is provided with an apertured cap, the driven shaft extending through the apertured cap and wherein a secondary thread pattern is formed on the driven shaft and a nut engaged on said secondary thread pattern to secure the said apertured cap to the assembly.

3. The improvements in a lever hoist set forth in claim 1 wherein the means for rotating the secondary body member comprise a plurality of teeth formed in the periphery of said secondary body member and a handle with a ratchet rotatably mounted on said body member and selectively engageable with said teeth.

4. The improvements in a lever hoist set forth in claim 1 wherein the annular flange and the sprocket are separate members provided with keyways and wherein said driven shaft is provided with a keyway and a key is positioned in said keyways to position said annular flange and sprocket in non-rotatable relation to said driven shaft.

5. The improvements in a lever hoist set forth in claim 1 wherein the annular ring about said cam disc is formed as a separate element secured in said body member against rotation.

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