Sept. 13, 1960 E. L. BIE 2,952,373

MANHOLE COVER LIFTER

Filed July 29, 1957

2 Sheets-Sheet 1

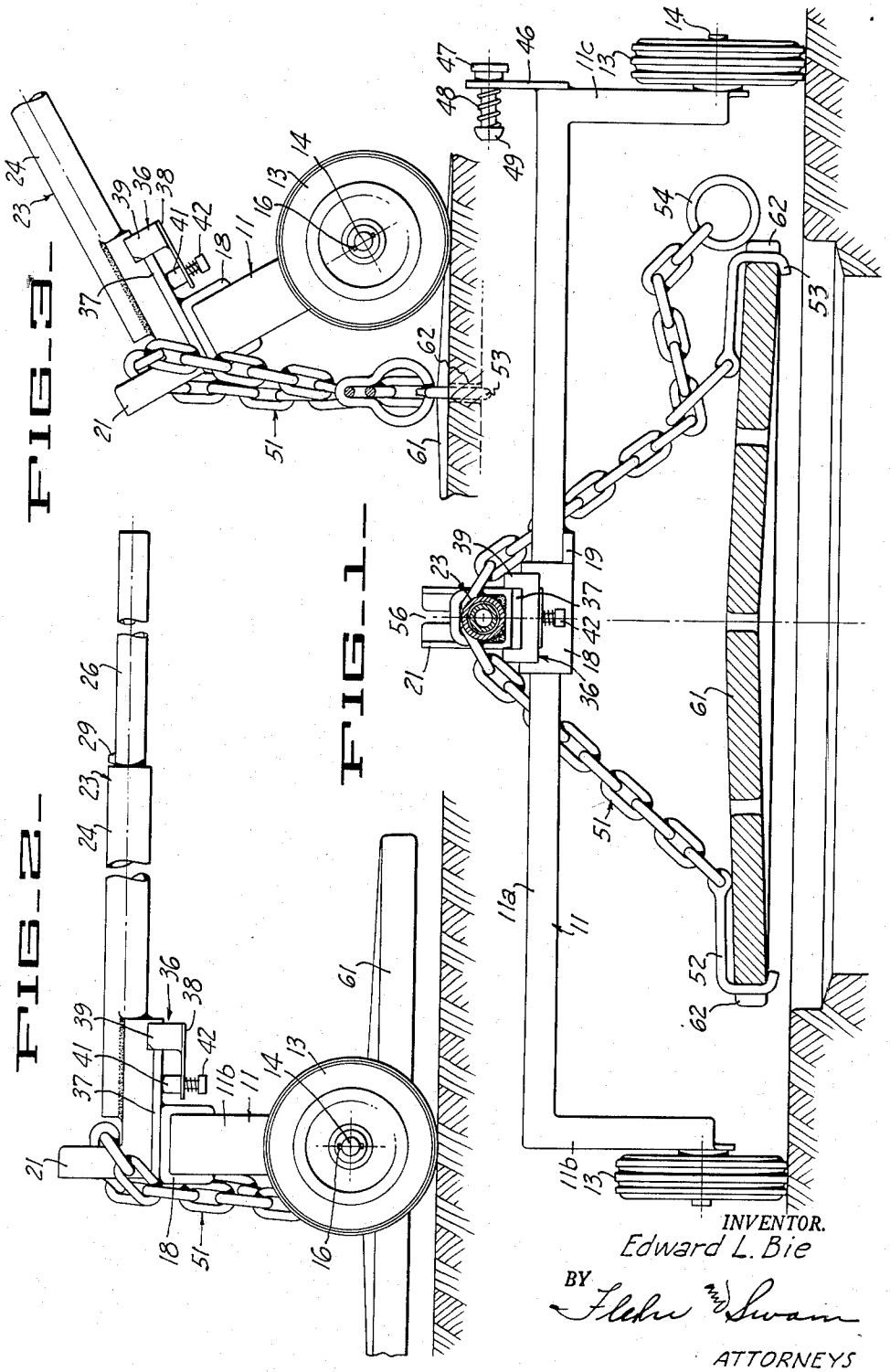

FIG. 1

FIG. 2

FIG. 3

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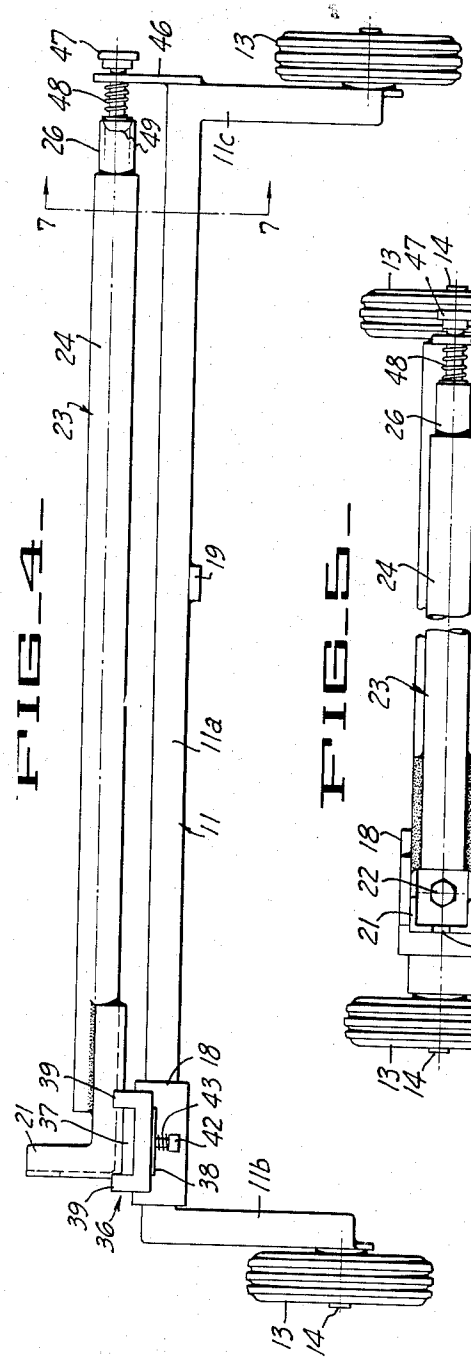

FIG. 4

FIG. 5

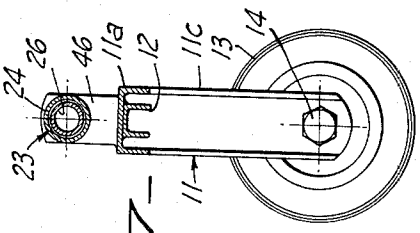

FIG. 7

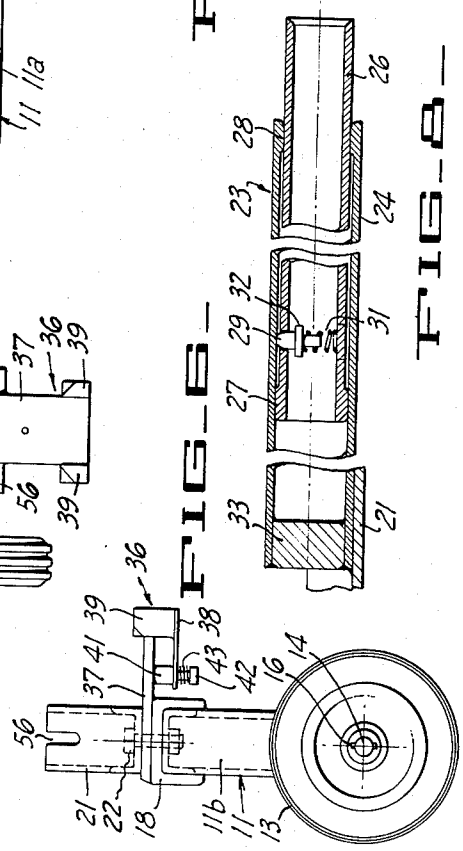

FIG. 6

FIG. 8

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United States Patent Office 2,952,373 Patented Sept. 13, 1960

2,952,373

MANHOLE COVER LIFTER

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Filed July 29, 1957, Ser. No. 674,951

2 Claims. (Cl. 214—370)

This invention relates generally to manhole cover lifters.

In the past manhole covers have generally been lifted by hand, that is by one or two individuals using hand hooks to grasp the manhole covers. Frequently the covers are so heavy that more than one man is required. The heavy lifting involved, in addition to being laborious, is often dangerous because it may strain or injure the backs of the lifters.

In general, it is an object of the present invention to provide a manhole cover lifter by which manhole covers may be readily lifted by one man with very little effort.

Another object of the invention is to provide a lifter of the above character in which the manhole cover can be readily moved after it has been lifted.

Another object of the invention is to provide a lifter of the above character which is readily adaptable for lifting different types of manhole covers.

Another object of the invention is to provide a lifter of the above character which can be folded up when not in use and which is readily transportable.

Additional objects and features of the invention will appear from the following description in which the preferred embodiment has been set forth in detail in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a front elevational view showing my manhole cover lifter being utilized for lifting manhole covers of the type having a pair of slots in the periphery of the cover.

Figure 2 is a side elevational view of the manhole cover lifter shown in Figure 1.

Figure 3 is a side elevational view of my manhole cover lifter showing the position of the lifter just before lifting takes place.

Figure 4 is a front elevational view showing my manhole cover lifter in a folded up position.

Figure 5 is a plan view of the manhole cover lifter shown in Figure 4.

Figure 6 is a left hand elevational view of the manhole cover lifter shown in Figure 4.

Figure 7 is a cross sectional view taken along the line 7—7 of Figure 4.

Figure 8 is a detail view of the handle assembly.

The manhole cover illustrated in the drawing consists generally of a frame **11** of suitable material such as channel iron. The frame **11** is substantially in the form of an inverted U with an intermediate horizontal portion **11***a* and depending vertical leg portions **11***b* and **11***c*. It will be noted that the intermediate portion **11***a* is relatively long whereas the leg portions **11***b* and **11***c* are relatively short. It will also be noted that the frame **11** lies in one plane. The horizontal portion **11***a* is provided with suitable reinforcing such as the channel member **12** which is fixed to the horizontal portion **11***a*.

A wheel **13** is mounted on the lower end of each of

the leg portions **11***b* and **11***c* by suitable means such as a stud bolt **14** which is fixed to the lower end of the leg portions **11***b* and **11***c* and upon which the wheel **13** rotatably mounted by suitable means such as roller bearings (not shown). A pin **16** mounted in the outer end of the bolt **14** serves to hold the wheel in place.

A mounting block **18** is slidably mounted on the intermediate portion **11***a* of the frame and may be moved from a position adjacent the leg portion **11***b* to a position adjacent the stop **19** fixed to the frame. The mounting block **18** is in the form of a rectangular member having a rectangular opening therein to accommodate the rectangular configuration of the channel iron forming the intermediate portion **11***a*.

An L-shaped lifting member **21** is pivotally mounted on the mounting block **18** by suitable means such as a cap screw **22**. A handle **23** consisting of two or more sections is fixed to the L-shaped lifting member **21** by suitable means such as welding. The handle as shown is comprised of two sections **24** and **26**, section **26** telescoping within section **24**.

Suitable means is provided for retaining the telescoping section **26** in an extended position. As shown, particularly in Figure 6, the telescoping section **26** is provided with an enlarged portion at its lower end which is adapted to engage an inwardly extending portion on the upper end of the section **24** to prevent removal of the section **26**. When the telescoping section **26** is pulled out so that the portion **27** engages the portion **28**, a pin **29** is pressed outwardly over the edge of the section **24** by a spring **31** to prevent collapse of the section **26**. A collar **32** formed on the pin **29** prevents loss of the pin **29**. The lower end of the section **24** is closed with a plug **33** to prevent the section **26** from dropping out of the section **24**.

A handle catch **36** is mounted on an extension **37** provided on the mounting block **18**. The handle catch consists of a plate-like member **38** which carries a pair of ears **39** extending upwardly on both sides of the extension **37**. The end of the plate-like member **38** opposite the ears **39** is carried by mounting posts **41** fixed to the extension **37**. A screw **42** carrying a spring **43** is threadedly mounted into the post **41**. The spring **43** serves to urge the ears **39** of the handle catch into a position in which the ears are normally in a position above the top surface of the extension **37**.

Means is provided for engaging the handle in a collapsed or telescoped position and consists of a member **46** which is fixed to the leg portion **11***c* and slidably carries a hand operated bolt **47**. The bolt **47** is normally pressed inwardly towards an extended position by spring **48** one end of which engages the member **46** and the other end of which engages the blunt flanged end **49** of the bolt. The blunt end **49** is adapted to seat in the outer end of the extension **26** in a manner hereinafter described.

My manhole cover lifter also includes a flexible member in the form of a chain **51** which is provided with a suitable manhole cover engaging means. As shown, the engaging means consists of a hook **52** mounted on one end of the chain and a second hook **53** mounted on one of the links of the chain near the other end of the chain. A ring **54** is mounted on the other end of the chain for a purpose hereinafter desribed. The L-shaped lifting member **21** is provided with a notch **56** which is adapted to receive a link of the chain as hereinafter described.

Operation of my manhole cover lifter may now be briefly described as follows: Let it be assumed that my manhole cover lifter is in the position shown in Figure 4 in which the handle is collapsed and has been folded to

a position in which it extends in a line parallel with the longitudinal axis of the frame **11** and that the handle is held in this position by the hand operated bolt **47**. To release the handle, the hand operated bolt **47** is retracted and the handle is swung clockwise as viewed in Figure 5 about the pivot formed by the cap screw **22**. When the L-shaped member **21** to which the handle is attached is near the handle catch **36**, the handle catch **36** is retracted until the L-shaped member overlies the extension **37** at which time the handle catch is released to permit the ears **29** to move upwardly along the sides of the L-shaped member **21** to prevent further rotation of the handle.

The mounting block **18** and the handle may then be slid to the right as viewed in Figure 5 until the block **18** engages the stop **19** at which point the center of the handle will be at the center of the frame **11**. The handle extension **26** is then extended until the pin **29** engages the outer edge of the handle section **24**.

The device is now ready for a manhole cover lifting operation. The device is pushed over a manhole cover **61** such as shown in the drawing so that the wheels **13** straddle the manhole cover. The hooks **52** and **53** on the chain **51** are dropped into the slots **62** in the manhole cover so that they engage the manhole cover and then an intermediate portion of the chain **51** is dropped over the top of the L-shaped member **21** as shown in Figure 2 while the handle of the lifter is in a raised position substantially as shown in Figure 3. Then to lift the manhole cover, it is merely necessary to push downwardly on the outer end of the handle which serves as a lever arm to raise the manhole cover as the wheels **13** are shifted into a position immediately underlying the point at which the chain **51** is attached to lift the manhole cover to an elevated position as shown in Figure 1. The manhole cover may then be wheeled in either a forward or backward position from the manhole and lowered onto the ground by allowing the handle to move upwardly. When the operation for which the manhole was removed has been completed, the manhole cover may then be lifted and moved into place and lowered in a manner similar to that hereinbefore described.

Certain manhole covers are provided with only one opening and in that case, only one of the hooks **52** or **53** is utilized. One of the links of the chain **51** is then dropped into the notch **56** when the handle is in a raised position and then the manhole cover may then be lifted in the same manner as hereinbefore described. The ring **54** has been provided for convenience in lifting the chain and for hooking and unhooking manhole covers.

It is readily apparent that the operation hereinbefore described can be readily performed by one person with ease. Very heavy manhole covers may be lifted with this device with very little effort on the part of the operator because of the long lever arm provided by the handle **23**.

After the lifting operation has been completed, the handle may be returned to the position shown in Figure 4 by pushing in the pin **29** and collapsing the handle and then swinging the handle to a positon in which it is parallel to the longitudinal axis of the frame **11**. The handle may then be engaged by the hand operated bolt **47**.

When the device is in a collapsed position, it may be readily carried about or stored in a very small space.

It is apparent from the foregoing that the use of my manhole cover lifter is particularly advantageous in that heavy manhole covers can be lifted by one person with very little effort and without the danger of causing backstrain or injury.

I claim:

1. In a manhole cover lifter, a frame substantially in the form of an inverted U with an intermediate substantially horizontal portion and depending substantially vertical leg portions, a wheel rotatably mounted on the lower end of each of the leg portions of said frame, a mounting member slidably mounted on the intermediate portion of said U-shaped member and movable between a position adjacent one of said leg portions and a position substantially equidistant from the leg portions, an extensible handle pivotally mounted on said mounting member and movable between a position at right angles to the longitudinal axis of the frame and a position substantially parallel to the longitudinal axis of the frame, a releasable handle catch carried by said mounting member, said releasable handle catch being adapted to releasably retain said handle in a position substantially at right angles to the longitudinal axis of the frame, said handle being movable between extended and retracted positions, and means carried by the frame for releasably engaging the outer end of the handle when the handle is retracted and in a position parallel to the longitudinal axis of the frame, a flexible non-extensible member having manhole cover engaging means mounted thereon, and means mounted on said frame for engaging said flexible non-extensible member whereby when said manhole cover engaging means is engaging a manhole cover said manhole cover may be raised or lowered by tilting of the handle.

2. In a manhole cover lifter, a frame substantially in the form of an inverted U with an intermediate substantially horizontal portion and depending substantially vertical leg portions, a wheel rotatably mounted on the lower end of each of the leg portions of said frame, a handle slidably mounted on said frame intermediate the leg portions of the frame for movement longitudinally of the intermediate horizontal portions of the frame and extending at right angles to the longitudinal axis of the frame, said handle being movable between a position at right angles to the longitudinal axis of the frame and a position parallel to the longitudinal axis of the frame, said handle also being movable between extended and retracted positions, means for retaining said handle in a retracted position when said handle is in a position substantially parallel to the longitudinal axis of the frame, a flexible nonextensible member having manhole cover engaging means mounted thereon, and means for securing said flexible nonextensible member to said frame whereby when a manhole cover is engaged by the manhole cover engaging means and the flexible nonextensible member is secured to said frame said manhole cover may be lifted as the outer end of the handle is lowered when the handle is in an extended position and in a position at right angles to the longitudinal axis of the frame.

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