Dec. 30, 1969 B. F. BOONE 3,486,650

HEAVY MOVER APPARATUS

Filed April 8, 1968 2 Sheets-Sheet 1

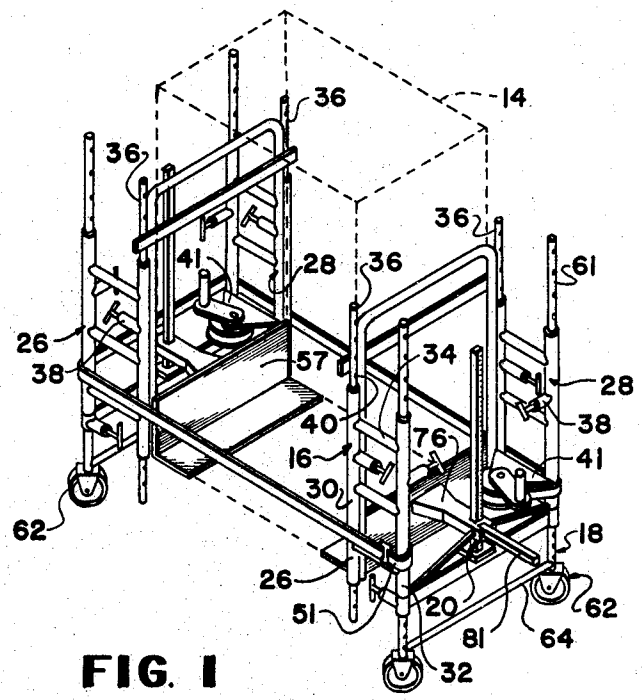


FIG. 1

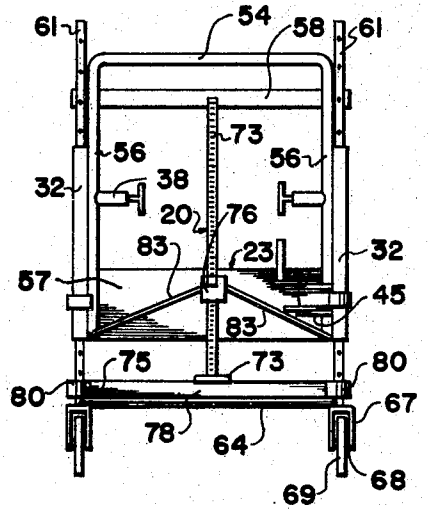


FIG. 2

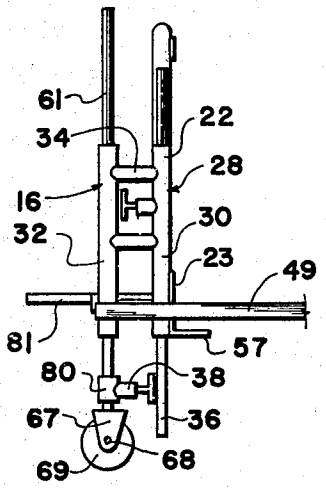


FIG. 3

INVENTOR.
BYRON F. BOONE

BY John H. Widdowson
Phillip A. Lein
ATTORNEYS

Dec. 30, 1969 B. F. BOONE 3,486,650

HEAVY MOVER APPARATUS

Filed April 8, 1968 2 Sheets-Sheet 2

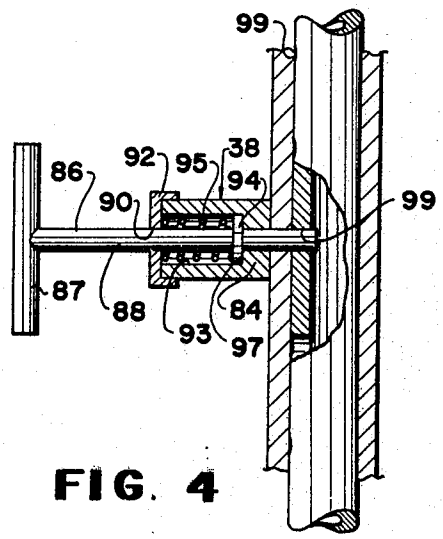


FIG. 4

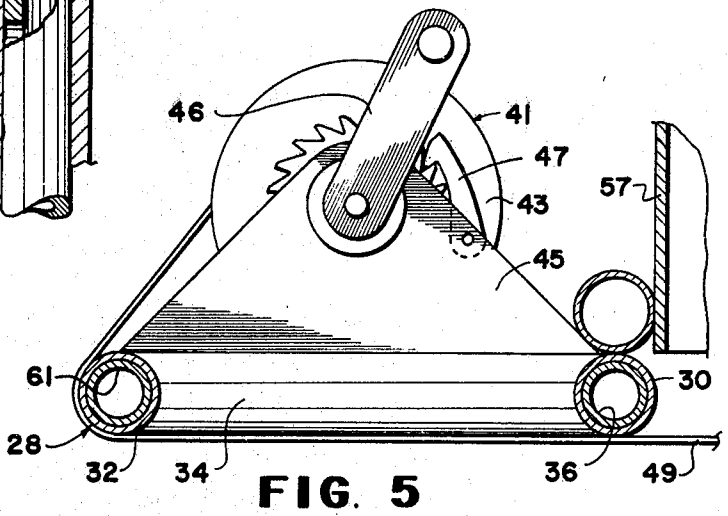


FIG. 5

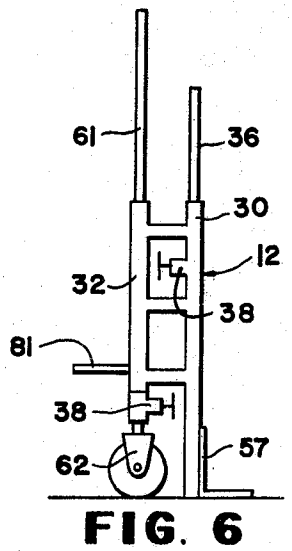


FIG. 6

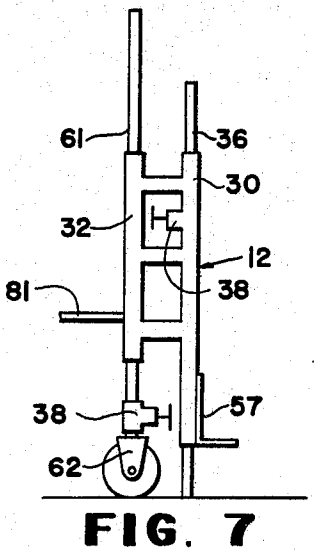


FIG. 7

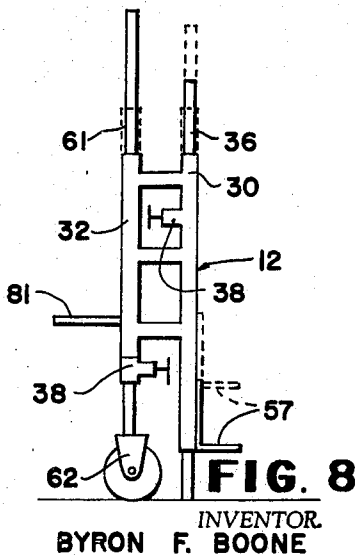


FIG. 8

INVENTOR.
BYRON F. BOONE

BY John H. Widdowson
Phillip A. Grin
ATTORNEYS

United States Patent Office 3,486,650 Patented Dec. 30, 1969

3,486,650

HEAVY MOVER APPARATUS

Byron F. Boone, 100 S. 160th E., Wichita, Kans. 67230

Filed Apr. 8, 1968, Ser. No. 719,527
Int. Cl. B60p 1/02
U.S. Cl. 214—390 6 Claims

ABSTRACT OF THE DISCLOSURE

This invention is a cooperating pair of mover apparatus used to elevate and move bulky objects through restricted areas. More specifically, this invention is a heavy mover apparatus including a connector and lift means attachable to an object to be conveyed; a support means attachable to the connector and lift means permitting the same to be movable vertically relative thereto; a jack means mounted upon the support means connected to the connector and lift means operable to selectively elevate the connector and lift means and interconnected load to any desired height as required.

Numerous types of article handling devices are known to the prior art attachable to a large object through interconected belt and strap members to be moved through a frame structure. However, the prior art devices are generally difficult to attach to a heavy article to be moved and merely operate to elevate the article above the supporting surface on wheel caster devices and, therefore, elevate the article to be conveyed a predetermined fixed distance. It is also noted that the prior art devices are generally limited in the height to which the conveyed articles may be elevated above the supporting surface.

In one preferred embodiment of the mover apparatus of this invention, generally used in pairs to move a heavy object, the same includes connector and lift means attachable to the article to be conveyed and connected through jack means to an upright support means. The connector and lift means includes a basic frame means having an attachment assembly connectible to the object to be moved. The frame means includes a pair of spaced, parallel support frame assemblies interconnected at the forward sides by the attachment assembly. Each support frame assembly includes a pair of upright spaced main tube members interconected by horizontally extended parallel support struts and having anchor assemblies connected thereto. Mounted within the forward tube members are upright auxiliary support posts operable to be moved axially therewithin and held in a desired position as by the anchor assemblies. The attachment assembly is provided with an inverted U-shaped stabilizer member having lower leg portions connected to an L-shaped support bed. The upper area of the leg portions are interconnected by a guard bar adapted to abut the article to be moved. The support means includes a pair of spaced support shafts interconnected as by a support strut at the lower ends thereof which, in turn, are respectively connected to swivel assemblies for easy movement of the entire structure. The support shafts are telescopingly mounted within the rearward tube members of the support frame assemblies and operable to be connected by anchor assemblies to the tube members so as to provide the desired vertical adjustment relative thereto. The jack means includes an upright actuator shaft connected to a support base and an actuator mechanism connected to the shaft and the support bed of the connector and lift means. The actuator mechanism is provided with a jack handle operable in conjunction with the actuator shaft to move the connector and lift means and an object carried thereon to the desired height. Additionally, a winch

assembly is mounted upon one of the end frame assemblies having a rotatable cylindrical drum receiving a strap member whereby the strap member is connectible to another cooperating mover apparatus to hold the article to be moved therebetween.

One object of this invention is to provide a mover apparatus overcoming the above-mentioned disadvantages of the prior art structures.

A still further object of this invention is to provide a mover apparatus operable with a minimum clearance with a supporting surface having jack means operable to raise and lower a load thereon as desired.

Another object of this invention is to provide a mover apparatus, preferably usable in pairs for attachment to an object to be conveyed, including a support means secured to a connector and lift means by a jack means whereupon the object conveyed can be moved vertically as desired by the jack means in order to pass through restricted areas and, additionally, to raise a heavy article to an elevated position for loading purposes.

One other object of this invention is to provide a mover apparatus that is rigid in construction, easy to use, economical to manufacture, and requiring a minimum of maintenance.

Various other objects, advantages and features of the invention will become apparent to those skilled in the art from the following discussion, taken in conjunction with accompanying drawings, in which:

FIG. 1 is a perspective view of the pair of the mover apparatus of this invention connected to an object illustrated in dotted lines to be moved;

FIG. 2. is a rear elevational view of the mover apparatus of this invention;

FIG. 3 is a side elevational view of the mover apparatus of this invention;

FIG. 4 is an enlarged elevational view of an anchor assembly of the mover apparatus of this invention having portions thereof broken away for clarity;

FIG. 5 is an enlarged fragmentary top plan view of the winch means of the mover apparatus of this invention; and

FIGS. 6, 7, and 8 are schematic diagrams illustrating the use and operation of the mover apparatus of this invention.

The following is a discussion and descripiton of preferred specific embodiments of the new mover apparatus of this invention, such being made with reference to the drawings, whereupon the same reference numerals are used to indicate the same or similar parts and/or structures. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring to the drawings in detail and particularly to FIG. 1, a pair of the mover apparatus of this invention, indicated generally at **12**, are shown as interconnected having a large object such as a rectangular box **14** mounted threbetween in a clamped relationship. Although the mover apparatus **12** has been illustrated as using a pair to lift and move the rectangular box **14**, it is obvious that a plurality of these devices could be attached to a common large object if required to provide the necessary load bearing support thereto. Each mover apparatus **12** includes a connector and lift means **16** slidably mounted upon a support means **18** and interconnected therebetween by a jack means **20** for relative movement.

The connector and lift means **16** includes a basic frame means **22** having an object attachment assembly **23** secured thereto. The basic frame means **22** includes a pair of spaced end support assemblies **26** and **28** interconnected through the jack means **20** and the attachment assembly **23** as will be explained. As each end support assembly

is identical, only one need be described in detail. As shown in FIGS. 1 and 3, the end support assembly **28** is provided with front and rear upright elongated tube members **30** and **32** interconnected by horizontally extended support struts **34** which may be of a pipe material or the like. The front tube members **30** are provided with elongated auxiliary support posts **36** telescopingly mounted therein and securable in adjusted axial position as by anchor asemblies **38**. The support posts **36** are provided with a plurality of equally spaced holes **40** operable to be selectively placed in locking engagement with the respective anchor assembly **38** as will be explained. The rear tube members **32** are also provided with anchor assemblies **38** for reasons to become obvious.

Only the end support assembly **28** is provided with a winch assembly **41** secured between the front and rear tube members **30** and **32** and the lowermost one of the horizontal support struts **34**. As shown in FIG. 5, the winch assembly **41** includes a cylindrical drum member **43** rotatably mounted between a pair of spaced triangular gusset plates **45** which are secured as by welding to the end support assembly **28**. A handle member **46** is connected to the cylindrical drum member **43** for assembly **47** is provided whereupon the cylindrical drum **43** is automatically latched on rotation in one direction and must be positively released before movement in the other direction. Additionally, the winch assembly **41** includes an elongated belt member **49** having one end connected to and trained about the cylindrical drum member **43**, and the other end of the belt member **49** is provided with a J-shaped metal clamp member **51** engageable with the rear tube member **32** on mating mover apparatus **12** as will be explained.

The attachment assembly **23** is provided with a U-shaped stabilizer member **54** having upright parallel legs **56** secured as by welding to the inner facing surfaces of the front tube members **30** on the end support assemblies **26** and **28** with the lower ends of the legs **56** secured to a support bed **57**. The upper ends of the legs **56** are interconnected by a guard bar **58** which provides a sock absorbing feature preferably constructed of wood engageable with the rectangular box **14** to maintain solid contact therewith. The support bed **57** is of generally L-shape in transverse cross section and secured as by welding on the back surface thereof to the legs **56**. The support bed **57** is preferably constructed of a heavy gauge steel material; however, any material can be used providing sufficient strength for carrying heavy objects.

The support means **18** includes a pair of parallel upright support shafts **61** having their respective lower ends connected to swivel assemblies **62** and additionally interconnected by a transverse support strut **64**. The upright shafts **61** are spaced a predetermined distance by the support strut **64** so as to be mountable in telescopingly relationship in respective ones of the rear tube members **32** on the end support assemblies **26** and **28**. Each support shaft **61** is provided with a plurality of equally spaced holes **65** adapted to be engageable with a locking feature of the anchor assemblies **38** mounted on the rear tube members **32** as will be explained. Each swivel assembly **62** is provided with a U-shaped support body **67** pivotally connected at the upper end thereof to the respective support shaft **61**. The lower ends of the support bodies **67** are each adapted to receive a shaft **68** having a wheel member **69** rotatably mounted thereon. The swivel assemblies **62** are of a generally conventional caster wheel type operable to maintain ease of movement while supporting a large load thereon. It is seen that the basic frame means **22** is movable in a generally vertical direction relative to the interconnected support shafts **61** of the support means **18**.

The jack means **20** includes a laterally extending base member **71** having an upright actuator shaft **73** thereon mounted on a base bar **75** and an actuator mechanism **76** connected to the shaft **73** and also to the support bed **57** of the basic frame means **22**. The base bar **75** is provided with an elongated main body **78** having tubular stub members **80** welded to opposite ends thereof each mounted about the respective support shafts **61** between the respective swivel assemblies **62** and the lower ends of the rear tube members **32** on the end support assemblies **26** and **28**. One of the anchor assemblies **38** is attached to each of the tubular stub members **80** and engageable with the respective support shafts **61** as will be explained. The actuator mechanism **76** is secured as by welding or the like in a rigid manner to the support bed **57** with the actuator shaft **73** mounted therethrough engageable with a laterally extended actuator handle **81**. The actuator mechanism **76** is given additional rigidity by support rods **83** welded thereto extended to the lower ends of the rear tube members **32** of the end support assemblies **26** and **28**. The operation of the jack means **20** is substantially identical to conventional automotive jacks; therefore, a detailed description of the operating mechanism is not deemed necessary. It is obvious that the handle **81** is movable in a vertical plane through a pumping movement to raise and lower the connector and lift means **16**.

As shown in FIG. 4, each of the anchor assemblies **38** includes a cylindrical housing **84** welded to the respective ones of the front and rear tube members **30** and **32** and the cylindrical stub members **80** and having a T-handle **86** connected thereto. The T-handle **86** includes a grasp end portion **87** integral with an elongated lock shaft **88** extended through an opening **90** in a cap member **92** into a cylindrical bore **93** within the housing **84**. The lock shaft **88** is provided with a lug portion **94** having a compression spring **95** mounted thereabout engageable with a stepped portion **97** and the cap member **92**. The spring **95** biases the T-handle **86** inwardly through an aligned hole **99** in the respective member mounted thereon to be engageable with the aforementioned spaced holes in the respective support shafts **61** and auxiliary support posts **36**. It is obvious that the T-handle **86** may be pulled to the left, as viewed in FIG. 4, to release the lock shaft **88** from the respective holes for axial movement. The compression spring **95** normally biases the entire T-handle **86** inwardly to the locked position and gives a positive indication of the secured position to prevent use of the mover apparatus **12** without properly locking all the required elements. Also, the lock shaft **88** may be provided with a laterally extended detent (not shown) movable in a slot in the housing **84** so as to latch the shaft **88** in the unlocked position for ease of usage.

In the use and operation of the mover apparatus **12** of this invention, it is seen that the jack means **20** can be lowered downwardly into abutting engagement of the stub members **80** with the respective swivel assemblies **62** by release of the anchor assemblies connected thereto. The jack means **20** can be actuated through the actuator handle **81** and moved to the lowermost position to place the entire connector and lift means **16** adjacent a supporting surface as shown in FIG. 6. In this position, it is seen that the support bed **57** is easily movable laterally to a position underneath an object to be moved such as the rectangular box **14**. The belt members **49** from the respective winch assemblies **41** are thereupon trained about the adjacent end support assembly **28** and connected to the rear tube member **32** of another cooperating mover apparatus **12** through the clamp member **51** as shown in FIG. 1. The handle member **46** of the winch assembly **41** can be rotated so as to pull the respective mover apparatus **12** into snug cooperating engagement with the rectangular box **14** to be moved.

Next, the jack means **20** can be operated through the actuator handle **81** to raise the interconnected connector and lift means **16** upwardly by axial movement on the shaft **73**. It is obvious that during this moving operation, the anchor assemblies **38** on the respective rear tube members **32** are pulled outwardly and rotated so as to

be in an unlatched position. The interconnected support bed **57** and its load may be elevated to any desired height but is also easily movable with only a quarter inch clearance between the same and the supporting surface. This is extremely important in many moving type operations such as refrigerators whereupon the doorway clearance is very close as it is seen the mover apparatus **12** may be constructed of a width to go through conventional doors and the height may be easily regulated.

In an operation where considerable height is required, on upward movement of the connector and lift means **16** through the jack means **20**, it is obvious that the anchor assemblies **38** on the rear tube members **32** may be moved to the latched position to hold the same in this relationship. The base member **71** and base bar **75** is thereupon raised upwardly by unlatching of the respective anchor assemblies **38** on the stub members **80**. On reaching a position adjacent the rear tube members **32**, the anchor assemblies **38** are latched to achieve the position as shown in FIG. 8. Then, the anchor assemblies **38** on the rear tubular members **32** can be again moved to the inactive position whereupon the jack means **20** can be actuated to provide additional height and movement of the connector and lift means **16**. It is obvious that the support shafts **61** can be of any desired length for achieving great height in lifting the box **14**.

The mover apparatus **12** of this invention is also easily operable through the use of the auxiliary support posts **36** to provide ease in loading and unloading from docks, pickup trucks, and the like. On reaching a desired height of the connector and lift means **16** by the jack means **20**, the support posts **36** may be lowered on release of the anchor assemblies **38** on the front tube members **30** into engagement with the support surface. These tube members **30** can be anchored by the respective anchor assemblies **38** whereupon the entire load will be carried thereon and the entire support means **18** can be raised to the uppermost abutting position as shown in FIG. 8. In this position, it is seen that a pickup truck could back under the raised support means **18** and the rear tube members **32** whereupon the support means **18** could be lowered onto the truck bed. The auxiliary support posts **36** would then be raised and the entire load pushed on the truck bed with a minimum amount of physical effort being required. This same procedure would be used in reverse to unload a heavy object from a truck bed or the like.

It is seen that the mover apparatus of this invention provides a new and novel cooperating structure attachable to more heavy objects and to elevate the same as required for movement through restricted areas where a minimum of surface clearance is required. Additionally, a pair of the mover apparatus of this invention cooperate in such a manner so as to be readily attachable to an object to be moved regardless of its particular size. The mover apparatus of this invention presents a durable structure that is economical to manufacture, simple to use, and reliable in operation providing the utmost safety during usage.

While the invention has been described in conjunction with preferred specific embodiments thereof, it will be understood that this description is intended to illustrate and not to limit the scope of the invention.

I claim:

1. A mover apparatus adapted to be attached to an object to be moved with a pair thereof normally required, comprising:

(a) a connector and lift means readily attachable to the object to be conveyed;

(b) support means connected to said connector and lift means;

(c) jack means mounted on said support means and connected to said connector and lift means operable to raise and lower said connector and lift means relative to said support means,

(d) said support means having a pair of upright support shafts having their lower ends interconnected by a strut member and having respective swivel members mounted thereon; and

(e) said jack means having an elongated base bar with opposite ends thereof mounted on respective ones of said support shafts for axial movement relative thereto.

2. A mover apparatus as described in claim **1**, wherein:

(a) said base bar having anchor devices engageable with said support shafts to anchor said base bar in a given axial position on said support shafts; and

(b) said jack means further including a jack base member mounted on said base bar, an actuator shaft mounted on said base member, and an actuator mechanism secured to said connector and lift means and operably connected to said actuator shaft for axial movement to raise and lower said connector and lift means.

3. A mover apparatus as described in claim **1**, wherein:

(a) said connector and lift means having a basic frame means connected to said support means and an attachment assembly connectible to the object;

(b) said basic frame means having end support assemblies, each provided with upright front and rear tubular members interconnected by horizontal struts, anchor devices connected to each of said forward and rear tubular members, and a winch assembly connected to one of said end support assemblies;

(c) said attachment assembly having an inverted U-shaped support member secured to said front tubular members and having its lower ends connected to a support bed to vertically support the object thereon:

(d) said support shafts telescopically mounted within said rear tubular members for selected axial movement relative thereto; and

(e) said jack means including an actuator mechanism secured to said support bed so that said jack means operates to elevate said connector and lift means relative to said support means.

4. A mover apparatus as described in claim **3**, wherein:

(a) said basic frame means having a pair of support posts mounted for axial movement within respective ones of said front tubular members and locked in a preselected position by said anchor devices on said front tubular members;

(b) said base bar movable axially on said support shafts and having anchor devices engageable with said support shafts to anchor same in a given position whereby said connector and lift means may be further elevated by said jack means to any desired position; and

(c) said support posts engageable with the supporting surface to support the entire object and permit upward movement of said support means whereby a truck having a bed which is movable under said support means for ease in loading and unloading the object, therefrom.

5. A mover apparatus as described in claim **4**, wherein:

(a) said winch assembly including a pair of gusset plates secured to said basic frame means, a cylindrical drum rotatably mounted between said gusset plates, a belt member connected to said drum trained thereabout, and a handle member connected to said cylindrical drum; and

(b) said belt member having a J-shaped connector member secured to one end engageable in a firm relationship with said rear tubular members from an adjacent mover apparatus, and said handle member rotatable to wind said belt member on said cylindrical drum in order to clamp the object between cooperating parts of said mover apparatus.

6. A mover apparatus as described in claim **1**, wherein:

(a) said jack means having a base bar with opposite ends mounted on respective ones of support shafts

for axial movement relative thereto and having anchor devices engageable with said support shafts to anchor said base bar in a given axial position thereon; and

(b) said connector and lift means having a basic frame means provided with upright front and rear tubular members and having anchor devices connected to each of said forward and rear tubular members whereby said connector and lift means can be independently supported on said front tubular members in an adjusted position while said base bar is moved relative to said support shafts thereby increasing considerably the availability of lifting of said connector and lift means.

References Cited

UNITED STATES PATENTS

1,520,630	12/1924	Bateman	214—390
2,463,381	3/1949	Hicks.	
2,934,373	4/1960	Doty	214—515
3,010,591	11/1961	Bard	214—390
3,370,725	2/1968	Jones	214—390
3,404,794	10/1968	Wilson	214—390 XR

ALBERT J. MAKAY, Primary Examiner

U.S. Cl. X.R.

254—2

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,486,650 December 30, 1969

Byron F. Boone

It is certified that error appears in the above identified patent and that said Letters Patent are hereby corrected as shown below:

Column 3, line 23, after "for" insert -- rotation thereof. A substantially conventional ratchet --; line 41, "sock" should read -- shock --. Column 5, line 50, "more" should read -- move --. Column 6, line 72, "cooperating parts" should read -- cooperating pairs --.

Signed and sealed this 10th day of November 1970.

(SEAL)
Attest:

Edward M. Fletcher, Jr.
Attesting Officer

WILLIAM E. SCHUYLER, JR.
Commissioner of Patents