Dec. 14, 1965 L. C. SCHWEHR 3,223,199

SCAFFOLDING HOIST

Filed Dec. 14, 1962 2 Sheets-Sheet 1

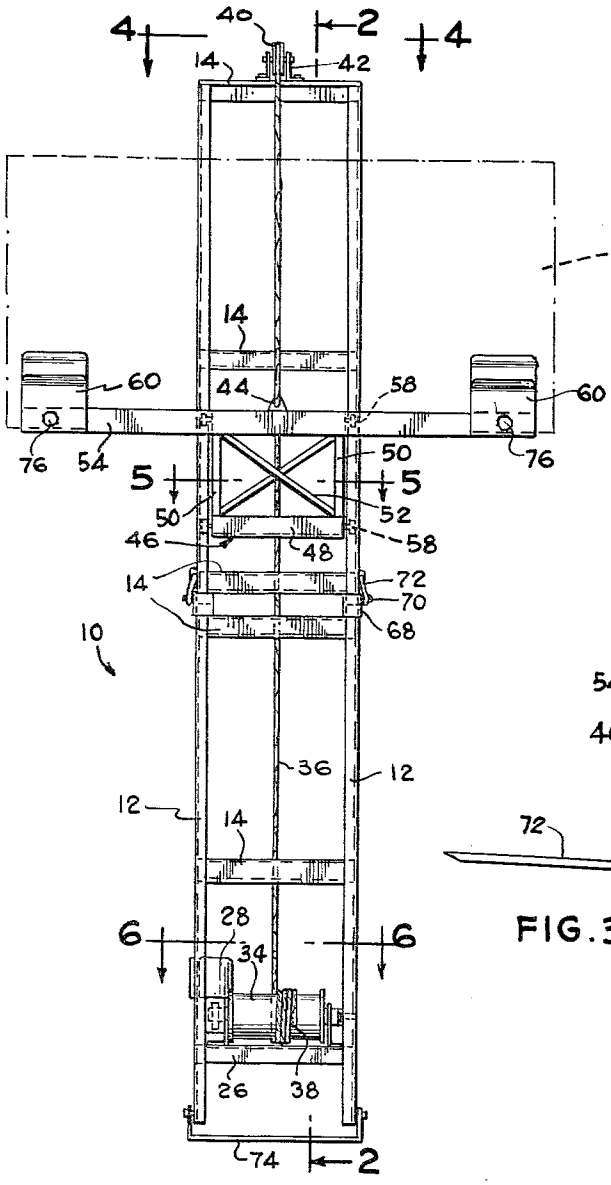


FIG. 1

FIG. 3

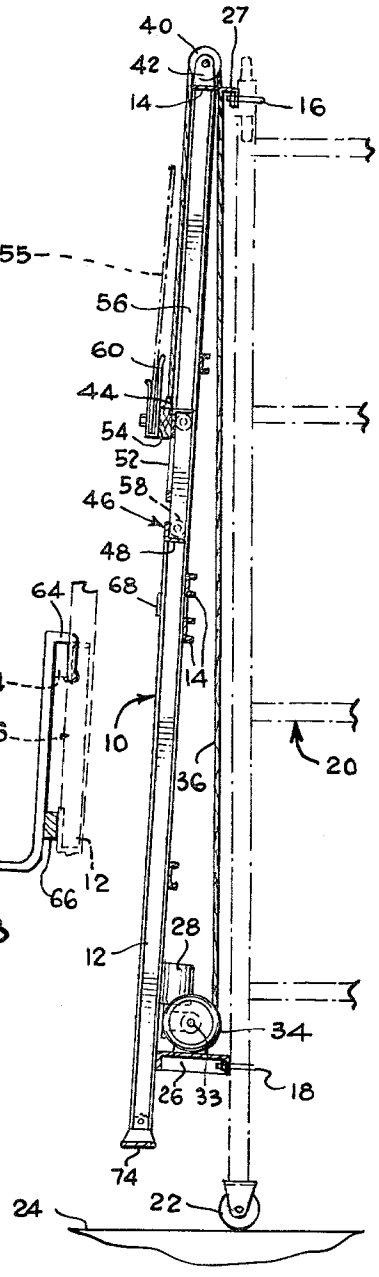


FIG. 2

INVENTOR
LEO. C. SCHWEHR

BY
Ooms, McDougall & Hersh
ATTORNEYS

Dec. 14, 1965 L. C. SCHWEHR 3,223,199

SCAFFOLDING HOIST

Filed Dec. 14, 1962 2 Sheets-Sheet 2

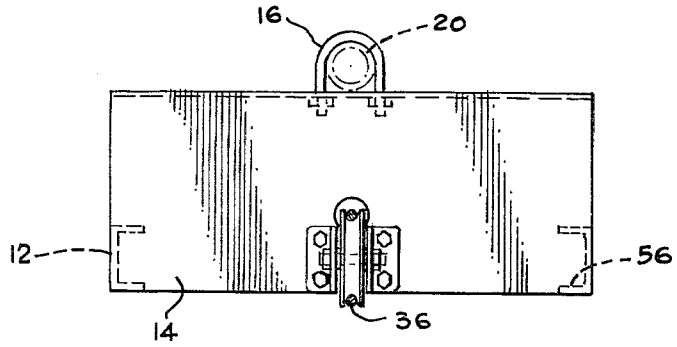


FIG. 4

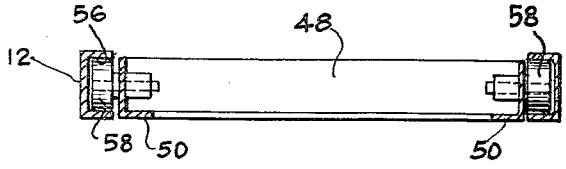


FIG. 5

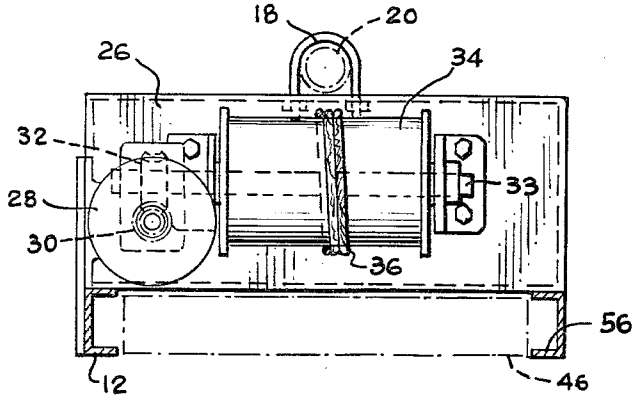


FIG. 6

INVENTOR
LEO C. SCHWEHR

BY Ooms, McDougall & Hersh

ATTORNEYS

United States Patent Office 3,223,199 Patented Dec. 14, 1965

3,223,199

SCAFFOLDING HOIST

Leo C. Schwehr, 33 Marshall Drive, Billings, Mont.

Filed Dec. 14, 1962, Ser. No. 244,720
1 Claim. (Cl. 187—2)

This invention relates to a hoist which is adapted to be utilized for raising articles to a position whereby they can be used for construction or for other reasons. In a particular application of this invention, the hoist is adapted for the raising of wallboard or other sheet-like construction materials. Futhermore, the hoist of this invention is particularly suitable for use in combination with scaffolding whereby a highly efficient construction operation can be undertaken.

In the construction and maintenance of buildings and in many other circumstances, workmen must operate at various heights above the floor of the building. It is customary to provide scaffolding or other structures for supporting workmen so that they may undertake their duties at elevated positions. Sectionalized scaffolding structures are available which can be assembled on the job to any desired heighth and which can be mounted on wheels so that the workmen can move to various positions without difficulty.

Although the workmen can easily move to various heights to carry out their duties, there are many instances where the materials which they must use are extremely heavy and cannot be readily lifted onto the scaffolding. Thus, in the construction of various buildings, wallboard and other sheet materials are frequently secured at elevated positions in a room. These panels are quite large and unwieldy, and in many cases weight hundreds of pounds. Manual lifting of such materials to elevated positions is in many cases impossible and is at best an extremely difficult and tiring operation.

The use of ropes or the like for raising such materials has also been found to be completely unsatisfactory. Certain motor driven means have been provided which are usually included as part of a scaffolding construction. These means have proven extremely expensive and various limitations in the heighth of the material lifting operation exist when the hoists comprise an integral part of a scaffolding construction.

It is an object of this invention to provide an improved hoist structure which is uniquely suitable for the handling of material employed for various purposes in buildings and the like.

It is a further object of this invention to provide a hoist structure which is portable in nature, and which can be employed in combination with various scaffolding constructions to provide a highly efficient means for handling material in the course of building construction or maintenance.

It is a more particular object of this invention to provide a hoist which can be used in combination with a scaffolding construction, or which can be employed as a separate unit for the handling of material, and which, for practical purposes is not subject to limitations as to the heighth to which material can be lifted.

It is a further object of this invention to provide a hoist structure which can be utilized alone or in combination with a scaffolding structure and which is characterized by a relatively simple and economical mode of manufacture and operation.

These and other objects of this invention will appear hereinafter and for purposes of illustration but not of limitation, specific embodiments of this invention are shown in the accompanying drawings in which:

FIGURE 1 is a front elevation of a hoist structure characterized by the features of this invention;

FIGURE 2 is a vertical section taken along the line 2—2 of FIGURE 1;

FIGURE 3 is a detail view of one form of a material handling means which can be utilized in the hoist construction;

FIGURE 4 is a plan view taken about the line 4—4 of FIGURE 1;

FIGURE 5 is a sectional view taken about the line 5—5 of FIGURE 1; and,

FIGURE 6 is a sectional view taken about the line 6—6 of FIGURE 1.

The hoist structure of this invention generally comprises a supporting frame and a carriage vertically movable along the frame. The carriage, which is adapted to carry materials to various vertical positions, is operatively connected through a cable to a reversible motor and worm gear combination. This combination, which drives a winch for winding and unwinding the cable, provides one unique feature of this invention since an automatic braking effect is achieved thereby. Thus, in any vertical position assumed by the carriage, the reversible motor and worm gear combination will hold the winch against rotation in either direction. Accordingly, the operation of the carriage can be accomplished by a workman through the use of a reversing switch and separate motions for stopping and braking of the carriage need not be undertaken.

The carriage preferably comprises a generally rectangular structure having wheels disposed adjacent its corners. These wheels are adapted to ride in tracks defined by the vertical members which form part of the supporting frame for the hoist. With this arrangement, completely unimpeded movement of the carriage can be effected.

The hoist structure of this invention is characterized by portable features whereby it can be adapted for use under widely varying circumstances. Specifically, the hoist structure is provided with a foot stand whereby it can be rested on the floor of a building and vertically supported in much the same manner as a ladder is supported against a wall. Furthermore, the hoist structure is provided with clamping means whereby it can be secured to scaffolding for raising material to workmen on the scaffolding. Since scaffolding of the type widely employed in the trade is adapted to be assembled to various heighths, the hoist structure of this invention has been designed whereby sections thereof can be added or taken away to accommodate the heighth of the scaffolding with which it is to be utilized.

The accompanying drawings illustrate a hoist structure **10** which is characterized by the above mentioned features and by various other advantages. The hoist structure consists of a pair of vertical frame members **12** and a plurality of horizontal frame members **14**. The structure illustrated includes U-bolts **16** and **18** which serve to secure the hoist to scaffolding **20**. This scaffolding, which may be of the sectionalized type, is provided with wheels **22** whereby it can be moved over the floor **24** to various positions.

The lowermost U-bolt **18** is fastened to a mounting plate **26**. The upper U-bolt **16** is secured to an extension **27** formed in the uppermost horizontal member **14**. It will be noted that the plate **26** is relatively wide whereby the hoist frame is angularly disposed with respect to the scaffolding.

Mounted on the plate **26**, there is provided a reversible motor **28** which drives the worm **30**. This worm in turn drives the gear **32** which is fixed on the shaft **33** of the winch **34**. A cable **36** is secured to the face of the winch at **38** whereby rotation of the winch will serve to wind and unwind the cable.

The cable **36** extends upwardly over the pulley **40**.

This pulley is rotatably mounted in elements **42** secured to the upper horizontal frame member **14**. The cable **36** extends downwardly to the point **44** where it is secured to the carriage means **46**.

The carriage means **46** includes horizontal members **48** and vertical members **50** which define a generally rectangular shape dimensioned to be received between the vertical frame members **12**. Cross bars **52** are provided for strengthening the carriage structure.

Secured to the upper horizontal member **48** of the carriage **46**, there is provided a bar **54**. This bar extends a substantial distance on either side of the hoist frame and comprises the means for supporting material to be lifted by the hoist. In the illustration, a sheet-like member **55** is supported by the carriage, however, it will become apparent that various other materials and even workmen can be raised with the use of the apparatus of this invention.

It will be noted that the vertical frame members **12** define channels **56**. The carriage **46** is provided at its corners with laterally extending wheels **58**. These wheels are journaled in the carriage and they ride in the channels **56**. It will be noted that during vertical movement of the carriage, the horizontal frame members **14** will be cleared whereby the carriage is free to move vertically all along the hoist.

In FIGURES 1 and 2, a pair of cradle members **60** are located at the opposite ends of the carriage bar **54**. These cradle members are adapted to receive sheet-like materials, such as shown at **55**, whereby the materials can be lifted to the top of the scaffolding. It will be appreciated that the slight angular disposition of the hoist frame will facilitate holding of the sheets as they travel vertically. Furthermore, it will be appreciated that the sheets can be easily reached by workmen at the top of the scaffolding **20** since the upper vertical extent of travel of the carriage **46** will expose virtually the entire sheet to workmen on the scaffolding. The sheet can then be easily lifted out of the cradle and positioned for securing to a wall or ceiling of a building.

FIGURE 3 illustrates an alternative form of a means for lifting material with the hoist of this invention. This means comprises a fork lift **72** having a return portion **64** which fits over the carriage bar **54**. A spacer **66** near the bottom of the fork lift holds the lift in a proper position for carrying articles on the hoist. It will be appreciated that the fork lift can be removed by lifting it off the bar **54**, while the bolts **76** provide for detaching of the cradles **60**.

In the operation of the described structure, it will be apparent that the carriage can be readily located at the bottom of the scaffolding whereby articles such as sheetrock can be disposed thereon. By operating the reversible motor **28**, the carriage can be quickly raised to the top of the scaffolding. Because of the drive combination employed, stopping of the motor will provide an automatic braking action so that the raised material will be held in position until removed.

As previously indicated, the hoist of this invention is adapted to be utilized in combination with scaffolding of various heighths. For this purpose, the vertical frame members **12** are provided in at least two sections and sleeve means **68** are adapted to fit around the ends of adjoining sections. Studs **70** project from these sleeves and latches **72** engage these studs to hold the sleeves in place. It will be obvious that any number of sections can be included in the structure to accommodate various heighths to which materials are to be raised. It is also to be understood that due to the provision of the foot stand **74** at the bottom of the vertical frame members, the hoist can be utilized without the necessity for attaching it to a scaffolding structure.

The apparatus of this invention is believed to present several distinct advantages including the use of a reversible motor, which may be an electric motor, in combination with the worm gear and winch structure whereby the need for a separate brake is eliminated. The hoist structure of this invention has been designed primarily for interior use, however, it will be obvious that outdoor use is also possible. The simple means of attaching and adjusting the hoist whereby it can be moved along the scaffolding of any of various dimensions also represents a highly important feature of this invention.

It will be understood that various changes and modifications can be made in the above described structure which provide the characteristics of this invention without departing from the spirit thereof particularly as defined in the following claims.

That which is claimed is:

A portable hoist structure adapted to be attached to scaffolding of the type comprising tubular structural members, said hoist structure comprising a generally rectangular supporting frame which includes a pair of vertical members defining a pair of inwardly facing channels forming tracks, outwardly extending means located adjacent the top and bottom of said frame, means on said extending means for securing the frame to said tubular structural members of said scaffolding, the lowermost of said extending means being wider than said upper extending means whereby said frame is inclined upwardly toward said scaffolding when secured thereto, a carriage vertically movable along said frame, said carriage comprising a rectangular structure dimensioned to be received within said vertical members whereby said carriage and said vertical members are substantially coplanar, wheels mounted on said carriage, said wheels extending laterally into said channels and being positioned at the four corners of said carriage, said carriage including a cross bar extending for a substantial distance outwardly of said vertical members on opposite sides of said hoist, said cross bar having means for receiving articles to be carried by said hoist, and means for moving said carriage upwardly and downwardly relative to said frame comprising a reversible motor, a worm gear driven by said motor, a winch operatively connected to said gear, a pulley mounted at the top of said frame, a cable extending from said winch over said pulley and being connected to said carriage whereby the cable is adapted to be wound and unwound by said winch, said motor and worm gear providing automatic brake means for said carriage when the carriage is at rest on said frame, and wherein said lowermost extending means comprises a platform and wherein said motor is supported on said platform.

References Cited by the Examiner

UNITED STATES PATENTS

1,379,808	5/1921	Fies	182—111
1,658,042	2/1928	Druschel	187—2
2,273,124	2/1942	McDaniels	182—108
2,531,346	11/1950	Schuchert	187—2
2,668,602	2/1954	Cushman	214—731
2,815,132	12/1957	Stone.	
2,883,002	4/1959	Moyer	187—2
3,028,978	4/1962	Dickens	254—139.1

SAMUEL F. COLEMAN, *Primary Examiner.*