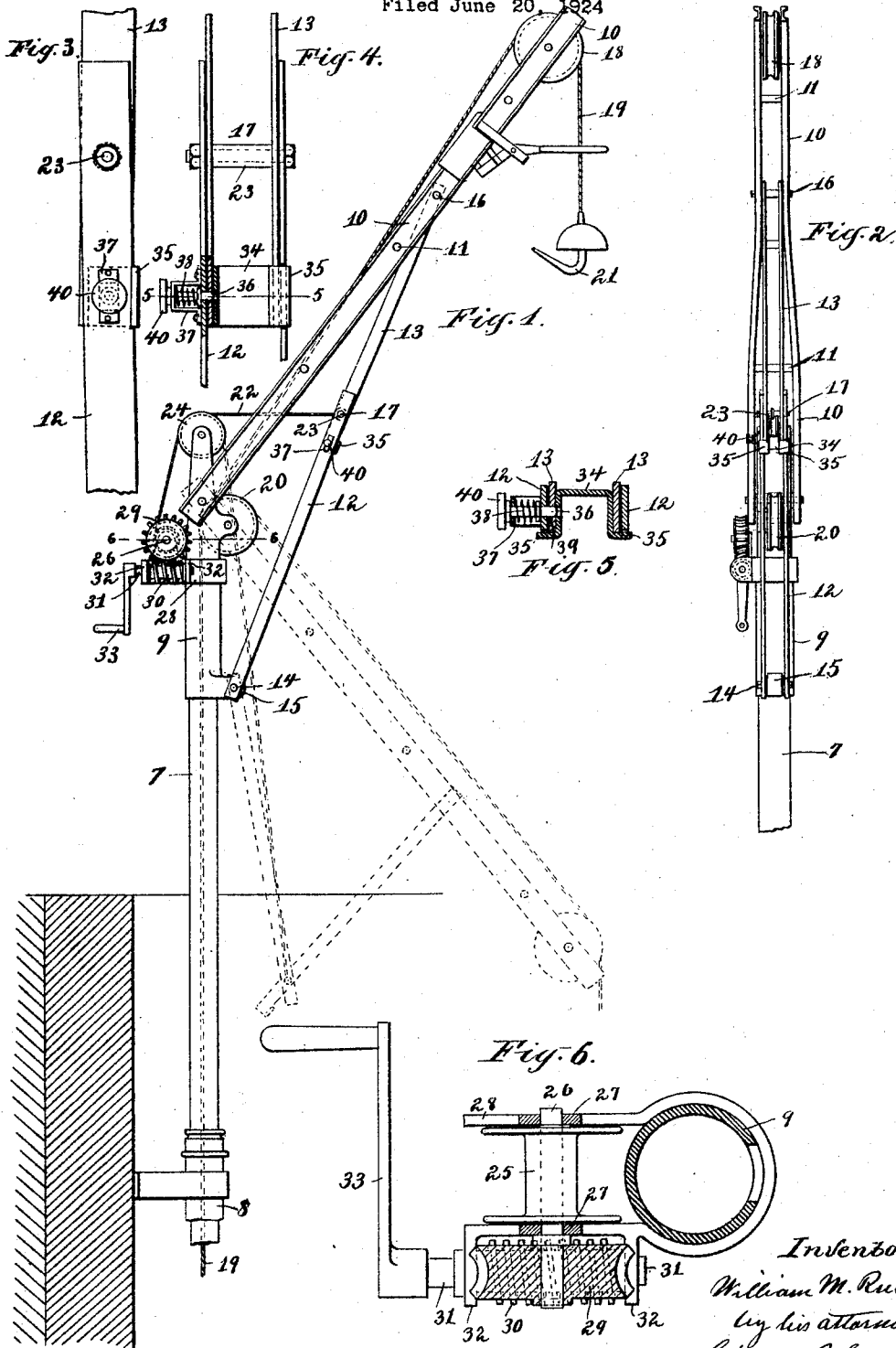


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W. M. RUTAN
HOISTING APPARATUS

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Inventor:
William M. Rutan,
by his attorney
Charles R. Searle.

UNITED STATES PATENT OFFICE.

WILLIAM M. RUTAN, OF ROOSEVELT, NEW YORK, ASSIGNOR TO GILLIS & GEOGHEGAN, INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

HOISTING APPARATUS.

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To all whom it may concern:

Be it known that I, WILLIAM M. RUTAN, a citizen of the United States, residing at Roosevelt, in the county of Nassau and State of New York, have invented a certain new and useful Improvement in Hoisting Apparatus, of which the following is a specification.

The invention relates to hoisting mechanism of the crane type, designed for service in a sidewalk hoistway and arranged to be collapsed therein when not in use, and more particularly to means for raising and supporting the jib of such hoist preparatory to performing the hoisting operations.

The object of the invention is to provide simple, easily operated means for elevating the jib to the hoisting position and for maintaining it reliably in such position during the hoisting operation.

The invention consists in certain novel features and details of construction and arrangement by which the above objects are attained, to be hereinafter described and claimed.

The accompanying drawings form a part of this specification and show an approved form of the invention.

Figure 1 is a side elevation showing the upper portion of the hoisting apparatus, with the jib in its elevated operative position.

Figure 2 is a corresponding front elevation with certain parts omitted.

The remaining figures are on a larger scale and show details.

Figure 3 is a side view of a portion of the foldable strut by which the jib is raised and supported.

Figure 4 is a corresponding front view partly in vertical section.

Figure 5 is a horizontal section taken on the line 5—5 in Figure 4.

Figure 6 is a plan view of the jib-raising means, partly in horizontal section, the plane of section being indicated by the line 6—6 in Figure 1.

Similar reference numerals indicate the same parts in all of the figures.

The invention is shown as applied to a well-known type of ash-hoist in which a tubular standard 7 is received telescopically in a tubular post 8 mounted in the sidewalk hoistway, and carries a rotatable head 9 on which the lower end of the jib 10 is pivoted.

The jib is composed of two channel bars held side by side and separated at the proper distance apart by transverse studs 11, and is supported in the angular elevated position by a foldable strut in two portions 12 and 13, the lowermost 12 pivotally connected at 14 to a lug 15 on the lower end of the head 9, and the uppermost 13 pivotally connected at 16 to the jib 10.

Each portion of the strut is formed of two parallel bars, and the two portions are hinged together at 17 so that when the centres 14, 16 and 17 are in line with each other the strut will serve as a stiff brace and hold the jib in the elevated position, but will fold at the joint 17 and permit the jib to descend, with the folded strut, as indicated by the dotted lines in Figure 1, and in this condition to be lowered into the hoistway by lowering the standard 7 into the post 8 through the operation of suitable raising and lowering mechanism, not shown, located in the hoistway.

At the outer end of the jib 10 is a pulley 18 over which the hoisting cable 19 runs from a pulley 20 mounted on the head 9, whence the cable extends downwardly within the standard 7 and post 8 to a winding mechanism, not shown, by which the load suspended from the hook 21 on the cable is raised and lowered as will be understood.

The jib 10 is lifted to the elevated or operative position by straightening the strut; this is effected by a light cable or rope 22 attached at one end to the bolt 23 forming the pivot of the hinge joint 17 and passing over a pulley 24 at the top of the head 9 to a winding drum 25 on a shaft 26 mounted in bearings 27 on a frame 28 secured to the head 9 to rotate therewith. The shaft 26 carries on its overhung end a wormwheel 29 in mesh with a horizontally disposed worm 30 on a worm-shaft 31 having its bearings in lugs 32 on the frame 28. The worm is rotated to turn the drum 25 by a crank 33 on the outer end of the worm-shaft, conveniently presented to the operator on the sidewalk.

In elevating the jib 10 from the collapsed position, shown in dotted lines in Figure 1, the crank 33 is turned in the direction to wind the rope 22 on the drum 25, the strain thus exerted on the bolt 23 straightens the strut toggle-wise, the resistance decreasing as the portions 12 and 13 approach aline-

ment in which position the jib is firmly supported.

The pitch of the worm and wormwheel is preferably sufficiently slow to hold the drum 25 frictionally against an unwinding movement and thus maintain the jib reliably in the elevated position and sustain any load to which the hoisting cable 19 may be subjected.

As a further safeguard against accidental folding of the strut, the hinge bolt 23 of the portions 12 and 13 is arranged to pass slightly beyond the centre line between the pivot 14 on the head 9 and the pivot 16 on the jib 10 in the straightening operation, so that the load-strains tend to fold the strut toward the jib; this is resisted by a stop 34 on the lower extremity of the upper portion 13 having wings 35 arranged to engage the outer adjacent edges of the lower portion 12, as clearly shown in Figures 3, 4 and 5, and thus prevent further inward folding movement of the strut.

An auxiliary positive holding means is provided by a pin 36 mounted in a housing 37 on the lower portion 12 of the strut, actuated by a spring 38 to enter and engage a hole 39 in the lower end of one of the flat bars forming the upper portion 13 of the strut, when the latter is straightened.

The jib is lowered by grasping the head 40 of the pin 36 and withdrawing the pin from engagement, and at the same time thrusting the midlength of the strut outwardly to move the bolt 23 beyond the centre line of the pivots 14 and 16; the strain is thus transferred directly to the cable or rope 22 and by turning the crank 33 in the reverse direction the jib descends by gravity and the portions 12 and 13 of the strut assume the angular folded position. In this condition the whole may be lowered into the hoistway.

In apparatus of this character it is the usual practice to raise the jib by the direct application of manual force, and to support it by a stiff strut manually placed in position. The mechanism above described permits the operation of elevating and lowering the jib to be performed easily and without danger of accident to the operator or damage to the hoisting apparatus.

Modifications may be made in the forms and proportions of the parts as found necessary or desirable in adapting the apparatus to various locations or conditions of service, and the stop 34 and locking pin 36 may be omitted or other holding devices substituted therefor.

I claim:—

1. A hoisting apparatus having a pivotally mounted jib, a pivotally united sectional foldable strut therefor, and means for folding and straightening said strut.

2. A hoisting apparatus having a pivot-

ally mounted jib, a pivotally united sectional foldable strut therefor, a cable attached to said strut, a winding drum for said cable, and means for rotating said drum.

3. A hoisting apparatus having a pivotally mounted jib, a pivotally united sectional foldable strut therefor, a cable attached to said strut, a winding drum for said cable, and worm-operated means for rotating said drum.

4. A hoisting apparatus having a pivotally mounted jib, a pivotally united sectional foldable strut therefor, means for folding and straightening said strut, and means for holding said strut in the straightened condition.

5. A hoisting apparatus having a pivotally mounted jib, a foldable strut therefor, means for folding and straightening said strut and holding it in the straightened condition, and auxiliary locking means for maintaining said strut in such condition.

6. A hoisting apparatus having a standard, a jib pivotally mounted thereon, a hinged strut in two portions with the upper portion pivotally connected to said jib and the lower portion pivotally connected to said standard, and means carried by said standard for straightening said strut.

7. A hoisting apparatus having a standard, a jib pivotally mounted thereon, a hinged strut in two portions with the upper portion pivotally connected to said jib and the lower portion pivotally connected to said standard, means carried by said standard for straightening said strut, and locking means carried by one of said portions and arranged for positive engagement with the other of said portions.

8. A hoisting apparatus having a standard, a jib pivotally mounted thereon, a hinged strut in two portions with the upper portion pivotally connected to said jib and the lower portion pivotally connected to said standard, a worm mounted on said standard, a wormwheel and shaft therefor mounted on said standard, a winding drum on said shaft, and a cable extending from said drum and connected to said strut.

9. A hoisting apparatus having a standard, a jib pivotally mounted thereon, a hinged strut in two portions with the upper portion pivotally connected to said jib and the lower portion pivotally connected to said standard, means carried by said standard for operating said strut and drawing the hinge centre thereof beyond the median line through the pivots at the opposite ends of the strut, and a stop adapted to limit such inward movement.

In testimony that I claim the invention above set forth, I affix my signature hereto.

WILLIAM M. RUTAN.