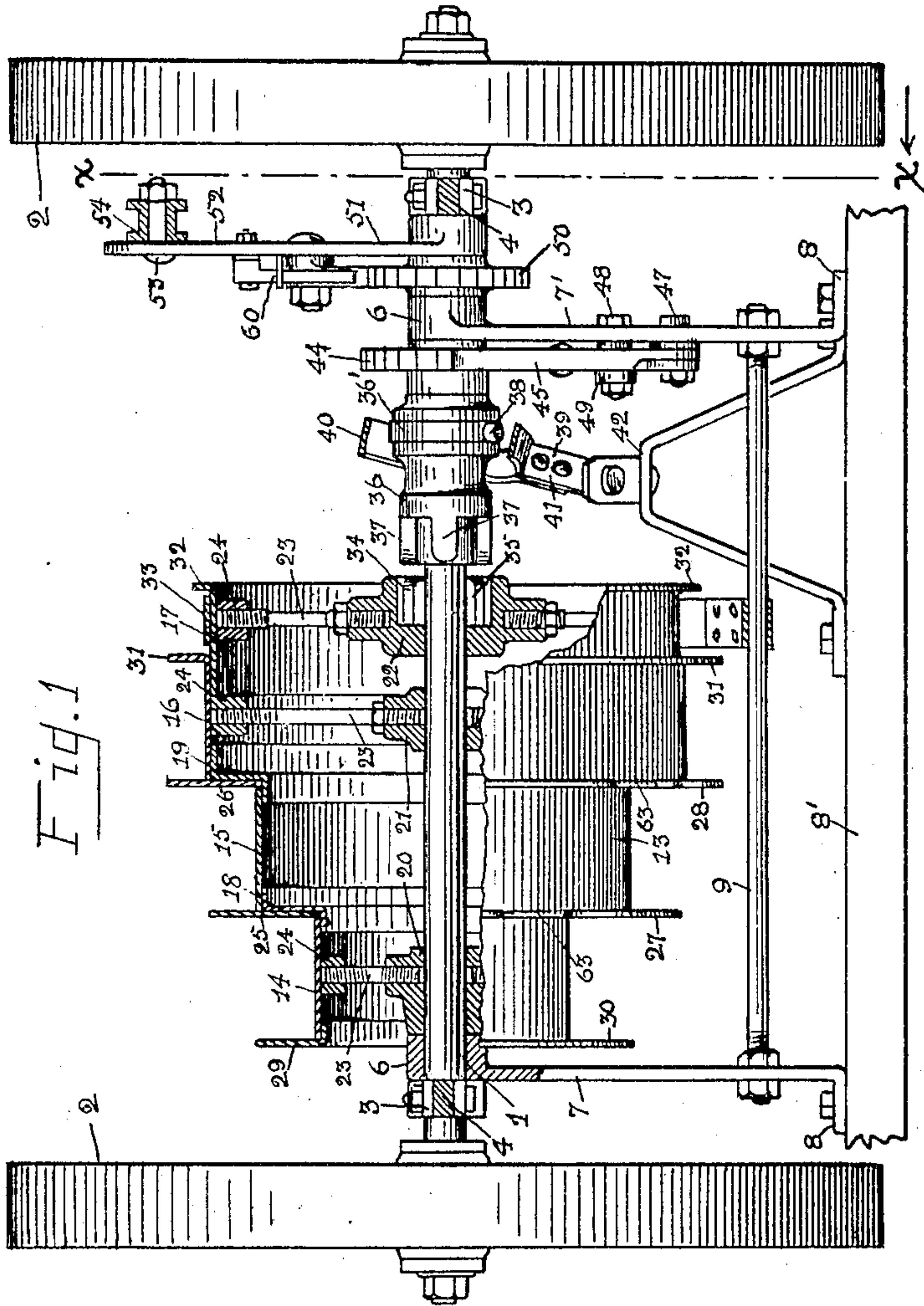


No. 869,421.

PATENTED OCT. 29, 1907.

W. CONNELLY.  
PORTABLE HOIST.  
APPLICATION FILED MAR. 23, 1907.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR.

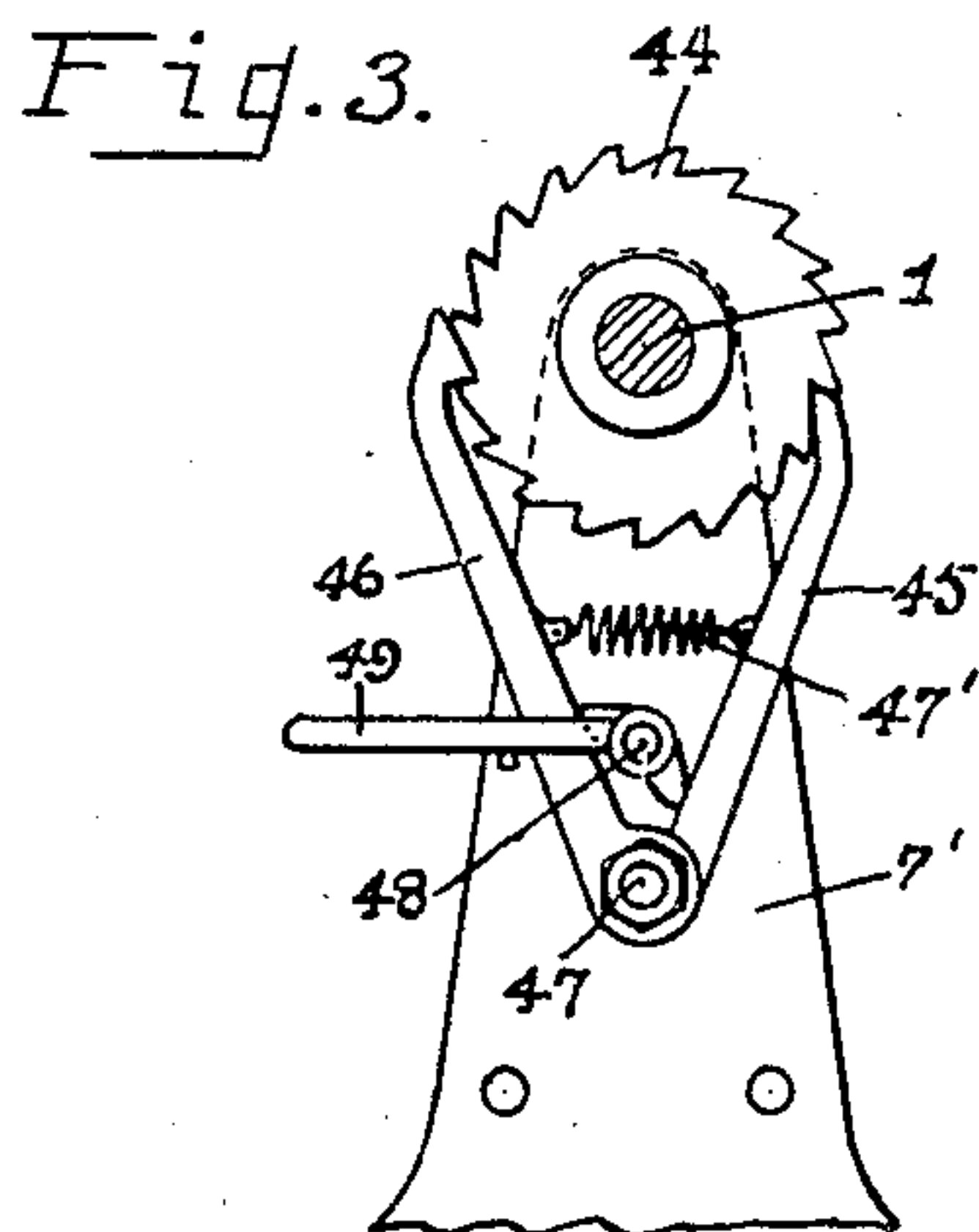
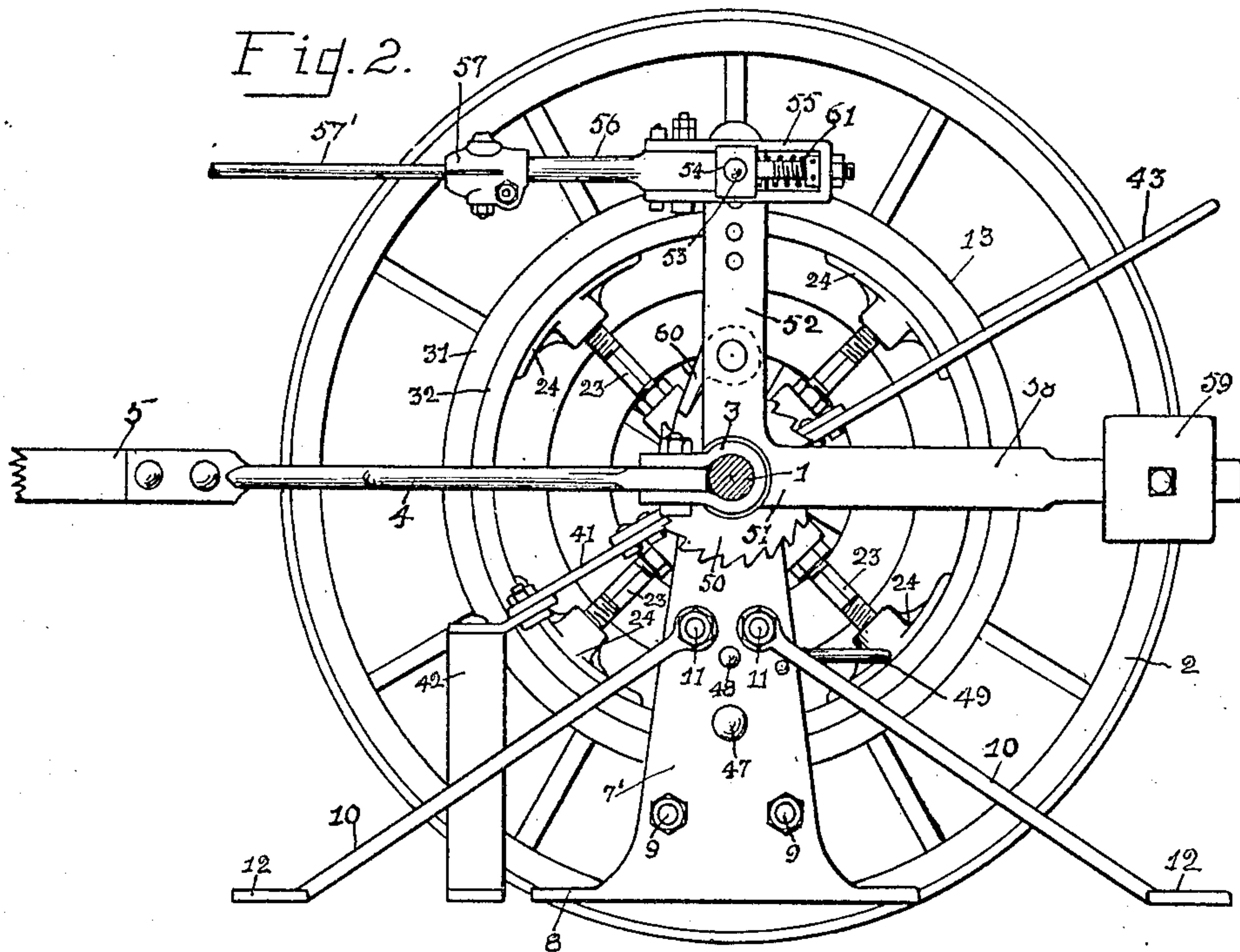
*William Connelly*  
*by Robt. B. Wilson*  
*his attorney*

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2 SHEETS—SHEET 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

WILLIAM CONNELLY, OF TOLEDO, OHIO.

## PORTABLE HOIST.

No. 869,421.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed March 23, 1907. Serial No. 364,167.

*To all whom it may concern:*

Be it known that I, WILLIAM CONNELLY, a citizen of the United States, residing at Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Improvement in Portable Hoists for Pulling Oil-

Wells, of which the following is a specification.

My invention relates to a portable hoist for oil wells, and the like.

In many oil fields the wells of the lease are operated by a central power, which is connected to each well of the lease by a line of shackle rods which is reciprocated to operate the pumping jack of the well. From time to time the tubing and sucker rods of the wells have to be pulled therefrom for repairs or for other reasons, and on such leases this operation is ordinarily accomplished by derricks that are hauled to the wells and operated by horses. The horses required for the purpose are usually hired from farmers in the vicinity of the lease and oftentimes they cannot be obtained when most needed, and this means of pulling wells is at all times expensive.

My invention has for its object to provide a portable hoist that is adapted to be conveniently moved about from well to well without the use of horses, by the men operating the lease, and there operated by the shackle or pulling rod of the well to lift the sucker rod or draw the tubing from the well, or lower them therein. I accomplish these objects by the construction and combination of parts hereinafter described, and illustrated in the drawings, in which

Figure 1 is a view in side elevation of my invention with the drum shown partly in vertical diametric section. Fig. 2 is an end elevation of the same, and Fig. 3 is a detail side view of the retaining ratchet and pawls.

In the drawings 1 designates an axle having end journals upon which may be mounted the traction wheels 2. Upon the axle, adjacent to the end journals, is pivotally mounted by the bearing straps 3, the bounds 4 of a tongue 5. There is also mounted on the axle by the bearings 6, the standards 7 and 7' having bases 8 suitable for mounting the axle on a well platform 8' when the wheels 2 are removed from the axle. The standards at a suitable distance above their bases are connected by a pair of rods 9, and are also each provided with a pair of brace rods 10, secured to the standards by the bolts 11, and diverging oppositely downward, the lower end portion of the brace rods being flattened and angled to the plane of the base of the standards to form the feet 12, which are perforated for lag screws or bolts for attaching the feet to the platform when the wheels 2 are dismounted. On the axle, adjacent to the standard 7, is loosely mounted a drum 13 which is preferably uniformly stepped from its least diameter at one end, to its greatest diameter at the opposite end, which is located centrally between the standards.

The drum preferably comprises the cylindrical sec-

tions 14, 15, 16 and 17, the step rings 18 and 19 upon which are telescopically mounted and secured by rivets the sections 14, 15 and 16, the hubs 20, 21 and 22 respectively for the sections 14, 16 and 17, the spokes 23 of a radius suitable for their respective sections, and provided each with a felly segment 24, curved to the circle of their respective sections, the annular disk rings 25 and 26 having inner diameters respectively for mounting on the sections 14 and 15, and outer diameters adapting them when secured to the outer faces of the rings 18 and 19 respectively to form retaining flanges 27 and 28 for the sections 15 and 16, the annular ring 29, L shaped in cross section, and having a diameter to telescopically fit into the outer end of the section 14 and form an end flange 30 for the section 14, the sections 14, 16 and 17 being riveted to the fellies of the spokes, the spokes having right and left threaded end portions, run into complementary threaded sockets in the hubs and fellies, the rings 25 and 26 being respectively riveted to the step rings 18 and 19, and the ring 29 being riveted to the outer end portion of the section 14.

The drum section 16 at the end opposite to the retaining flange 28 is provided with an integral radial retaining flange 31, and the section 17 which is of a diameter to telescopically enter the outer end of the section 16 is provided at its outer end with the radial retaining flange 32. The inner end portion of the section 17 is riveted to the section 16, the outer portion between the flanges 31 and 32 being adapted for engagement by a band brake 33 mounted thereon.

The hub 22 of the section 17 is enlarged and is provided at its outer end with a clutch socket 34 having the outwardly tapered and inwardly projecting longitudinal ribs 35, the outer ends of which are flush with the outer end of the hub and rounded.

Adjacent to the hub 22 the axle 1 has mounted thereon and feathered to move longitudinally, the clutch head 36 complementary to the socket 34, having the radial ribs 37 complementary to the ribs 35. The clutch head 36 is rotatable in a collar 36' mounted thereon, which is provided with the trunnions 38, projecting radially opposite, to which is pivotally attached the lever 39 comprising a loop portion 40 surrounding the head, the arm 41 pivoted to a suitable bracket support 42, and the handle portion 43 extending oppositely and in line with the arm 41.

Between the clutch head and the adjacent standard 7' is fixedly mounted on the axle 1, the retaining ratchet wheel 44, and engaging the ratchet wheel are the pawls 45 and 46 which are mounted on a common pivot bolt 47 projecting from the adjacent standard 7'. The outer end portion of the pawl 45 is bent inward to engage the teeth of the ratchet on one side of the wheel below a line diametric to the wheel, and the outer end portion of the pawl 46 is also bent inward, and formed as a bevel headed hook which is complementary to the



ker's forming the teeth, and the pawls are connected by a helical spring 47' which allows the pawls to be moved out of engagement with the abrupt ends of the teeth as the wheel is revolved in one direction, and  
 5 draws them inward into position to respectively engage teeth on opposite sides of the wheel when it stops and hold the axle against backward turning. Between the pawls 45 and 46 there is mounted in the standard 7' a pivot bolt 48 on which is pivotally mounted a cam  
 10 lever 49, adapted to simultaneously disengage the pawls from the wheel 44, when it is desired to allow the unwinding of the rope from the drum. On the opposite side of the standard 7' there is fixedly mounted on the axle 1, a ratchet wheel 50, and between the outer  
 15 ratchet wheel and the adjacent hound bearing, there is loosely journaled on the axle a bell crank lever 51 having an arm 52, the outer end portion of which is provided with a series of pin holes, in one of which is mounted a wrist pin 53, to which is pivoted a square  
 20 bearing block 54, which is mounted to slide in a strap 55 mounted on one end portion of a connecting rod 56, which at the opposite end is provided with a coupling sleeve 57, which is adapted to be coupled to one end of the shackle or pull rod 57' by which the pumping jack  
 25 of an oil well is connected to a distant engine used to pump a series of surrounding wells. The other arm 58 of the bell crank is provided with a weight 59 which is raised by a pull on the arm 52 by the shackle rod, the weight being adapted to prevent the crank arm and the  
 30 shackle rod from passing beyond horizontal alinement when the latter has reached the limit of its forward reciprocation. To the arm 52 is pivoted the pawl 60 which is adapted to engage the teeth of the ratchet wheel 57 as the arm 52 is pulled forward by the shackle, and  
 35 thereby turn the axle 1. Between the bearing block 54 and the end of the strap 55 is mounted a helical spring 61, the resistance of which is adjustable by the screw 62, and whereby the engagement of the pawl 60 with the teeth of the ratchet wheel is yieldingly received,  
 40 and the load is lifted without a sudden jar.

Thus constructed, my hoist is readily drawn about on its wheels from one well to another, and the wheels being there dismantled from the axle, the hoist is readily mounted on the well platform by its standards,  
 45 in position to pull the sucker rod or tubing from the well.

Being thus mounted and the shackle rod of the well being connected to the arm 52 of the bell crank, at each pull stroke of the shackle rod the axle 1 will be given  
 50 a part of a revolution in the direction of winding the pulling rope on the drum, and one end of the rope being extended through the well derrick hoisting pulleys and made fast to the top section of the sucker rod or tubing, and the clutch head being moved into the  
 55 clutch socket by its lever, at each pull stroke of the shackle rod the tubing or sucker rod is hoisted a distance, and there retained by the pawls 45 and 46 during the return stroke. When the top section of the tubing or rod being hoisted is fully raised from the  
 60 well, a supporting clamp or elevator extending across the top of the casing is secured to the top portion of the next section, whereby the tubing or rod is supported, after which the top section is uncoupled and the clutch lever is thrown to release the drum and lower the un-  
 65 coupled section from which the rope is then discon-

nected and made fast to the next section of the rod or tubing that is being hoisted from the well. The raised section being uncoupled and removed, the clutch head is again thrown into the clutch socket on a return stroke of the bell crank, and the operations of suc-  
 70 cessively raising and uncoupling the sections as described is repeated until all of the sections of the rod or tubing are removed from the well.

The retaining flanges 27 and 28 of the drum sections 15 and 16 are each provided with an incut 63 through  
 75 which the drum rope, as the hoisting progresses, may be successively transferred from the section 14 to the section 15, and from the section 15 to the section 16, the section 14 being employed at the beginning, and as the weight of the rod or tubing diminishes the speed  
 80 of its removal is increased by transferring the load successively to the sections 15 and 16.

When my hoist is used for lowering the sucker rod or tubing into a well, a section secured to the end of the drum rope is lowered its length into the casing of  
 85 the well either by withdrawing the ratchet pawls 45 and 46 by the cam lever 49, and the pawl 60 by turning it over in reversed position on the pivot, or by withdrawing the clutch head 36 by the clutch lever. The section will then be lowered by its own weight  
 90 controlled by the brake on the drum until the top end portion of the section is just above the top of the casing of the well, where it is supported across the top of the casing by means engaging its upper coupling, while  
 95 another section is coupled to the top of the first, and the drum rope being secured to the top of the second section, it is then lowered and secured in like manner as the first, and the operation is repeated until the entire sucker rod or tubing is in position in the well.

By the construction shown and described I have  
 100 provided a simple, inexpensive and convenient hoist whereby the sucker rods and tubing of oil wells may be inexpensively pulled therefrom by the distant power which is employed to pump the well through the medium of a connecting shackle rod, and lowered  
 105 therein by its own weight, and which may be readily transferred from well to well and from lease to lease on its own wheels without the use of horses, by the men employed to operate the lease.

What I claim to be new is—

1. A portable hoist, comprising an axle provided with end journals, traction wheels mounted on the end journals, means mounted on the axle adapted to be carried by the axle when the axle is moved about by the wheels, and to fixedly support and journal the axle as a shaft, a hoisting  
 115 drum mounted on and rotatable by and with the axle when the axle is operated as a shaft, means mounted on and carried by the axle adapted to tighten or loosen the drum on the axle when the axle is operated as a shaft, means mounted on and carried by the axle adapted to intermittently revolve the axle in one direction at regular intervals when the axle is in use as a shaft, and means carried by the support adapted to prevent backward revolution of the axle during periods of its rest when the axle is mounted and operated as a shaft.  
 125

2. In a portable hoist, the combination of a support, a shaft journaled in the support, means mounted on the shaft adapted to intermittently revolve the shaft in one direction at regular intervals, means to prevent backward revolution of the shaft during its periods of rest, a hoisting drum loosely mounted on the shaft, and means mounted on and rotatable with the shaft and adapted to engage or disengage the drum and rotate it with the shaft.  
 130

3. In a portable hoist for oil wells and the like, the com-



bination of a portable shaft, a support for the shaft adapted  
 ed to be carried by and to rotatably journal the shaft, a  
 drum loosely mounted on the shaft, a clutch head feathered  
 on the axle and adapted to be moved longitudinally thereon  
 5 into locked engagement with the drum, and to revolve the  
 drum with the axle as the axle revolves, means to move the  
 clutch head into and out of engagement with the drum, a  
 ratchet wheel fixed on the shaft, a bell crank lever pivoted  
 at its angle on the axle, and having a rock arm and a  
 10 weight arm, a connecting rod pivotally connected at one end  
 to the rock arm of the bell crank and adapted at the other  
 to be coupled to means to reciprocate the connecting rod, a  
 ratchet pawl pivoted to the rock arm of the bell crank,  
 adapted in the forward stroke of the connecting rod to en-  
 15 gage the ratchet wheel, and to disengage itself therefrom  
 on the rearward stroke, and means to secure the shaft  
 against backward revolution during the backward stroke  
 of the bell crank.

4. In a portable hoist for oil wells and the like, the com-  
 20 bination of a support, a shaft journaled on the support, a  
 step drum journaled on the axle, the steps of the drum being  
 provided with annular retaining flanges that are continuous  
 at the ends of the drum, and that are provided with incuts  
 at the intermediate steps, allowing the rope coiled on the  
 25 drum to be transferred from a step of smaller diameter to  
 a step of increased diameter, means mounted on the shaft  
 adapted to engage and disengage the drum whereby the  
 drum when so engaged is revolved with the axle, and when  
 disengaged permits the independent revolution of the drum  
 30 and the axle, means to intermittently revolve the axle a  
 part of a revolution, comprising a bell crank lever pivoted  
 at the angle on the axle, and having a rock arm and a  
 weight arm, a connecting rod pivotally connected at one  
 end to the rock arm of the bell crank, and adapted at the  
 35 other to be coupled to means to reciprocate the connecting  
 rod, a ratchet wheel fixed on the shaft, a pawl pivoted to  
 the rock arm of the bell crank, adapted to engage the  
 ratchet wheel on the forward stroke of the connecting rod,  
 detachable means to automatically prevent backward revo-  
 40 lution of the axle during the backward stroke of the con-  
 necting rod, and means to retard the backward movement  
 of the drum when loose on the shaft.

5. In a portable hoist, the combination with a rotatably  
 supported shaft, of a stepped drum rotatably mounted and

adapted to be fixed on the shaft, comprising a series of 45  
 cylindrical winding sections of progressive diameters, and  
 a brake section telescoped in and secured to the winding  
 section of greatest diameter, annular step rings each  
 having integral cylindrical flanges projecting oppositely 50  
 from the inner and outer peripheries of the annular disk  
 portion, and telescopically connecting and secured to adja-  
 cent cylindrical sections, radial flanges on the outer ends of  
 the end sections and annular disks secured to the outer  
 faces of the step rings, having inner diameters to receive a  
 cylindrical section. 55

6. In a hoist, the combination with a rotatable axle pro-  
 vided with a winding drum, and having a ratchet wheel  
 mounted and fixed on the axle, and means to intermittently  
 rotate the axle a part of a revolution in one direction, of a  
 pair of pawls jointly pivoted on a support and adapted to 60  
 respectively engage opposite teeth of the ratchet wheel and  
 prevent backward revolution of the axle between the peri-  
 ods of its intermittent revolution, a coil spring connecting  
 the pawls between the pivot and their engaging ends, and  
 a cam lever interposed between the pawl and adapted to si- 65  
 multaneously disengage the pawls from the ratchet wheel.

7. In a portable hoist, the combination of a support, a  
 shaft journaled on the support, means to intermittently  
 revolve the shaft in one direction at regular intervals,  
 means to retain the shaft and prevent backward revolution 70  
 during the intervals of its rest, a drum journaled on the  
 shaft and having a hub provided with a socket and with  
 tapering ribs at intervals projecting into and longitudinal  
 of the opening of the socket, a clutch head feathered on  
 and movable along the shaft into and out of the socket of 75  
 the hub and having tapered longitudinal ribs projecting  
 radial from the periphery of the head adapted to inter-  
 mesh with the ribs of the hub, and means to move the head  
 into and out of the socket during intervals when the shaft  
 is at rest, substantially as set forth. 80

In witness whereof, I have hereunto signed my name in  
 the presence of two subscribing witnesses, this 23rd day of  
 February, 1907.

WILLIAM CONNELLY.

In presence of—  
 CHARLES FOX,  
 H. C. LAMB.