

May 19, 1931.

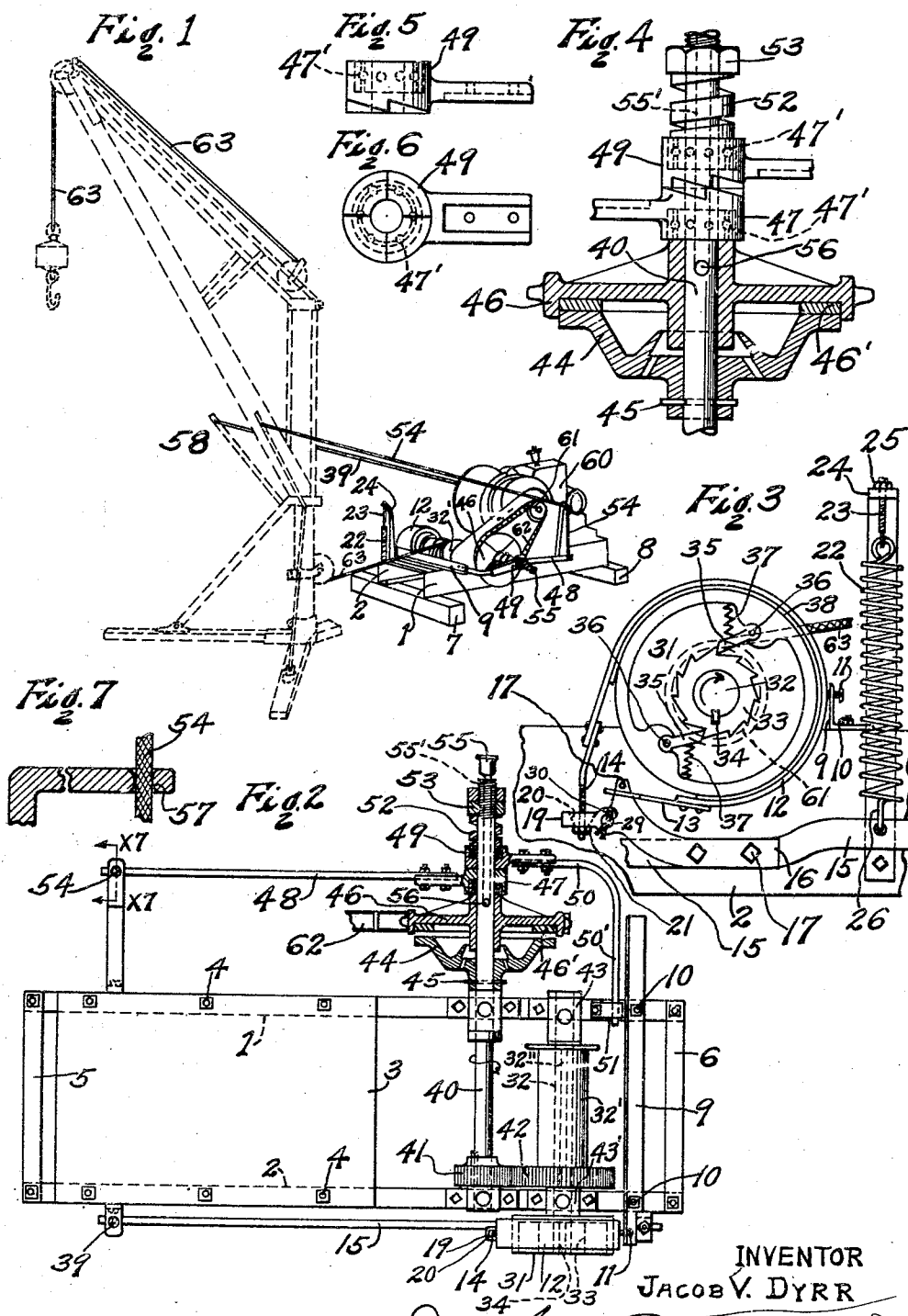
J. V. DYRR

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REMOTE CONTROL HOIST

Filed Dec. 26, 1928

2 Sheets-Sheet 1



INVENTOR

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WITNESS:

John A. McHowell

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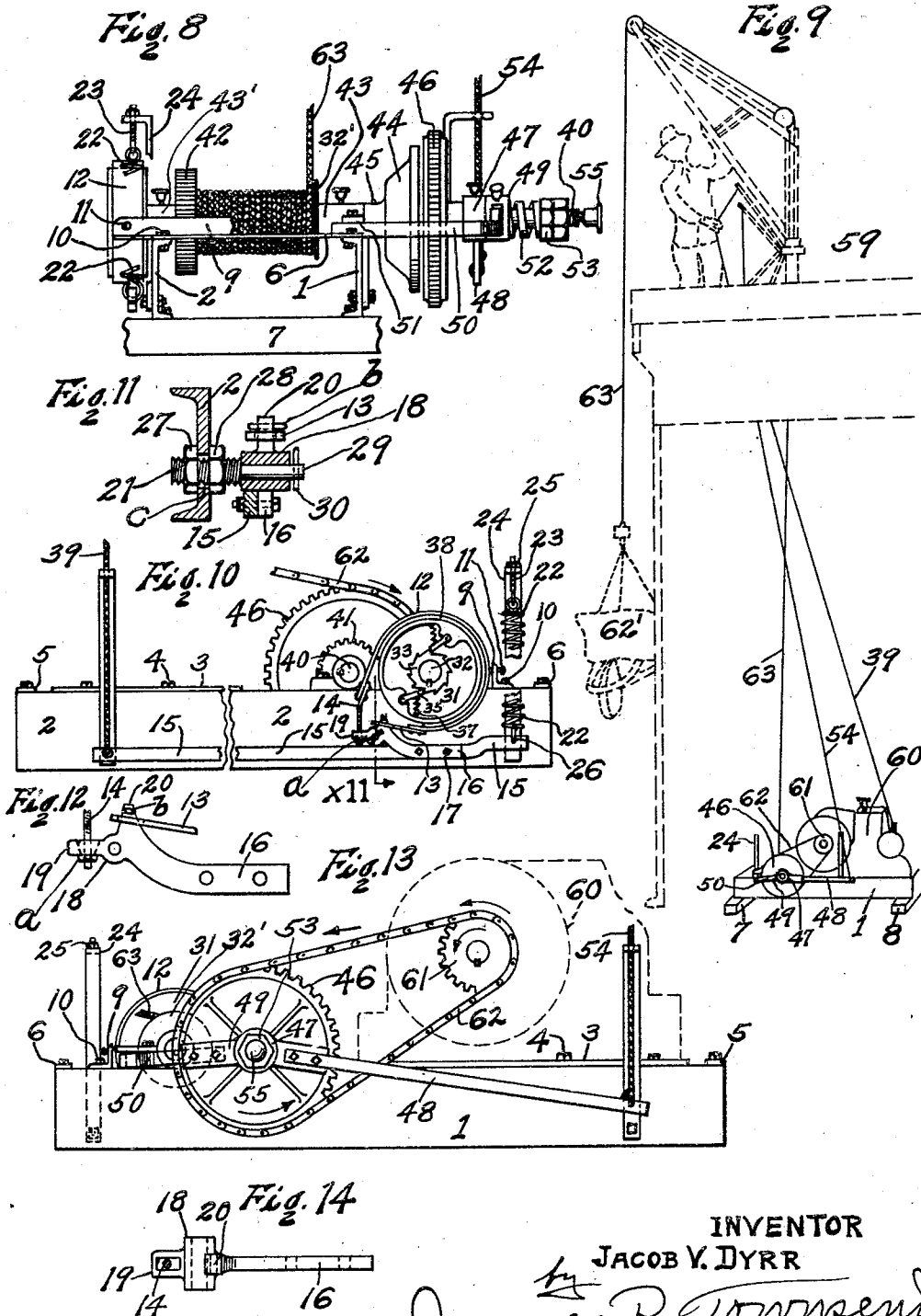
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UNITED STATES PATENT OFFICE

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REMOTE CONTROL HOIST

Application filed December 26, 1928. Serial No. 328,515.

An object of this invention is to provide a hoist that the operator can control from any distance within, or out of, sight of the hoist machinery so that he need not divert his attention to such machinery, but can constantly watch the load and place it exactly where it should be placed.

A further object is to enable the operator during such operation, to perfectly control the hoist by the use of only one hand at a time, meanwhile leaving his feet free to support his body, and also leaving the operator free to move about while he is swinging the load into and is placing it in, the exact position desired.

An advantage of the invention is that it enables one workman alone, and without any assistance from a helper, to place art stones and other finishing parts exactly where required.

The invention includes the combination with a shaft provided with a normally released clutch and with a normally set brake, of independent means under the control of the operator to cause engagement of the clutch; and independent means under the control of the operator to release the brake.

An object of the invention is to make the hoist perfectly safe for inexperienced operators, and this is effected by automatically holding the load with a brake at all times except when released by operation of the control line therefor.

This invention is broadly new, basic and pioneer in that provision is made for two independent line controls so that by leading both lines to any desired place, the operator stationed at that place can operate the two lines independently of each other so as to exactly place the load.

Another advantage is that a workman can attach the load to the hoist line and then go to the control station on a scaffold or elsewhere and handle the load without a helper, thus making it possible for one man to do a job that heretofore required a man and a helper.

The invention includes the hoist, and parts and combinations of parts going to make up

the same and more particularly hereinafter described.

This hoist is of the class operable by a motor constantly running in one direction, as an electric motor or an internal combustion engine of common type, and will be shown herein as connected to be operated by such an engine.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The accompanying drawings illustrate the invention.

Figure 1 is a perspective view looking from the control station toward the hoist in operative position in solid lines with control lines extended from said station as though attached to a derrick indicated in broken lines; the hoist or draft line being also extended as though holding a load, not shown, and supported by the derrick; the hoist engine and base are also shown in solid lines.

Fig. 2 is a plan view in reverse position relative to the hoist shown in Fig. 1, and omitting the engine and the hoist and controlling lines shown in Fig. 1.

Fig. 3 is a fragmental side elevation of the brake control shown in Fig. 2.

Fig. 4 is a fragmental plan partly in section showing the clutch in set position.

Fig. 5 is a detached view of one of the clutch operating cams.

Fig. 6 is a face view of the clutch member shown in Fig. 5.

Fig. 7 is a fragmental sectional view on line $\alpha\alpha$, Fig. 2, showing the form of guide through which the line is extended from the hoist.

Fig. 8 is an elevation of the hoist mechanism in operative position looking to the left of Fig. 2, toward the engine plate, and looking to the right in Fig. 1, from the control station indicated by the derrick in broken lines.

Fig. 9 is a diagrammatic side elevation of the hoist in the position shown in Fig. 1; broken lines indicate a derrick on a scaffold and a wheelbarrow as a load being hoisted.

Fig. 10 is a fragmental elevation from the brake side; that is to say, from the left side

of Fig. 8; the engine is omitted and a fragment of the clutch driving sprocket chain is shown.

Fig. 11 is a vertical sectional detail of the brake lever connection on line α 11, Fig. 10.

Fig. 12 is an enlarged side elevation of a malleable cast iron purchase forming part of the brake control lever and its immediate connection together with fragments of the brake band terminals.

Fig. 13 is an elevation of the clutch side of the hoist.

Fig. 14 is a plan detail of what is shown in Fig. 12.

The frame as shown is constructed of two channel iron sills, an engine plate, and cross bars. The channel iron sills 1, 2, are secured together by the steel engine plate 3 which is fixed to the top flanges of the sills by bolts or rivets 4 at the rear end of the frame. The cross bars 5 and 6 are respectively secured to the bottom and top flanges of the channel iron sills. The lower flanges of the channel iron sills are secured by suitable means to sleepers 7 and 8.

9 is an angle iron brake-band stop support secured to the top flanges of the sills as indicated at 10, and a set screw is mounted thereon to limit the retraction of the steel spring brake band 12 of common form having a slotted front end 13 and a threaded rear end 14.

The resiliency of the brake band tends to release the brake and is normally overcome by a brake control lever that is illustrated in Figs. 10, 11 and 12 as made up of a steel lever bar 15 and a malleable cast iron purchase 16 fixed to the bar 15 by bolts 17 and provided with a fulcrum bearing 18 and also provided on opposite sides of the bearing with a slotted attachment arm 19 for the threaded end, and a lug 20 for the slotted end of the brake band. A nut a on the threaded end, and a cotter pin b on the lug, secure said ends to the purchase.

The lever 15 is fulcrumed to the frame by a pin 21 and its front end is connected to a spring 22 supported by a bolt 23 carried by a bracket 24 fixed to the channel-iron sill 2 of the hoist frame and adjustable by the nut 25 to regulate the normal brake setting action. The spring is shown provided with a hook 26 to engage the front end of the lever 15. The channel-iron sill 2 is provided with a hole to form a seat c for the pin fixed to the sill 2 by nuts 27, 28; while the outer end of the pin 21 is reduced as at 29 and the brake control lever is secured thereto by a cotter pin 30. The weight of the lever extension on one side of the fulcrum pin 29, together with the upward tension of the spring 22, normally contracts the brake band on the brake drum 31 that is journaled to the windlass shaft 32 to which the ratchet wheel 33 is fixed by the key 34, and is held by pawls 35 from revolving

backwards to unwind the windlass 32' which is fixed to the windlass shaft 32 as by the key 32''.

The pawls 35 pivoted by pivots 36 to the brake drum are normally held in catching position by the compression springs 37.

The steel brake band 12 is provided with the usual composition friction shoe 38 and is normally held in brake setting position by the downward pressure of the lever extension 15 and the upward pressure of the contractile spring 22. The free end of the lever extension 15 is provided with a line 39 by which the free end of the brake control lever 15 can be drawn up, thus expanding the brake band, and releasing the brake. While the brake is set, the brake drum is held stationary and the windlass shaft 32 and windlass 32' are prevented from revolving in the direction indicated by the single-barb arrow.

The power shaft 40 is provided with a spur pinion 41 that is fixed to said shaft 40 and meshes with a windlass driving spur gear 42 that is fixed to the windlass shaft 32 which is journaled at 43, 43' to the channel-iron sills 1 and 2 of the frame.

The power shaft 40 is provided with a clutch plate 44 that is fixed thereto by a pin 45 in position to be engaged by the clutch disc 46 which is provided with the composition clutch facing 46' and is journaled on the power shaft 40 and is slidable along the said shaft 40 by a shifting device consisting of a cam collar 47 journaled by ball bearings 47' on the power shaft 40 and fixed to a clutch control lever 48 and constantly engaged with a complementary cam collar 49 that is journaled on the power shaft with ball bearings 49' and held in fixed relation to the hoist frame 50 by an extension arm 50' which is slidably mounted at 51 on a sill 1 of the frame.

A spring cushion 52 positioned between adjusting nut 53 and the slidable complementary cam collar 49, is adapted to receive the thrust of the cam collar when the clutch cams are engaged by a slight movement of the clutch control line 39 to close the clutch. 55 is a grease cup communicating through the channel 55' to deliver oil to an oil hole 56 to lubricate the shifting clutch.

The clutch control lever 48 is normally depressed by its own weight to allow the clutch to run free. The clutch control line 54 is attached to the free end of the clutch control lever 48 and is led through a stationary eye 57 to the place of control.

The lines 39 and 54 are led to the operator's station which may be at any place where the operator can observe the work, as for instance, on the surface of the ground as at 58, or in a tunnel, or on a platform, not shown, or on a scaffold 59; and when he does not pull either line, the engine 60 with its sprocket 61, runs freely without affecting the hoist, and

the drum 32' stands still, and a load 62', if suspended by the hoist line 63, will not descend until the brake control line is tightened and the brake is thus released.

8 If the operator wants to pull or lift a load, he will pull line 54 to shift the clutch into action, and the engine 60 which is connected by a sprocket chain 62 with the sprocket 61 forming the perimeter of the sliding clutch member 46, revolves the clutch and the spur gears 41 and 42, and this lifts the load. If the sprocket chain 62 or the control line 54 should break, the engine may continue to run, but the load will be held stationary because the brake is set and the pawls 35 prevent the drum shaft from revolving until the operator pulls upon the brake control line 39, thus releasing the brake and allowing the drum to revolve. The brake may be released to a greater or less extent, depending upon the extent to which the lever is lifted; and if the line 39 should break, the spring 22 and the gravity of the lever extension 15 would immediately set the brake and stop the load.

25 In practical use for placing art stones in walls, the derrick 63 will be stationed on a platform or elsewhere that will serve as a support for the operator and the art stone carried by the windlass line 64 will be under the control of the operator to swing the art stone in a horizontal plane without any attention being paid to the hoist controlling lines, and if it is found that the art stone is slightly higher or lower than the required level, the operator may pull upon the line 54, gently shifting the clutch just sufficiently to lift the art stone to the required level; or if the art stone is too high, he can pull on the line 39 just enough to release the brake sufficiently to lower the art stone the distance required.

40 It is thus seen that I have provided the hoist with frictional means in the form of the brake on one side of the hoist frame controlled by a line, and have provided the hoist on the opposite side with a friction clutch and means for controlling the same. The clutch is automatically held out of operation by the gravity of its lever and the spring means, so that lifting operations cease automatically, and descent is prevented automatically and it is only by the lifting of one or the other lever that the hoist becomes active either for moving the load or holding it stationary.

I claim:—

55 1. In a hoist, the combination of a power shaft provided with a normally released clutch; ratchet means; a windlass driven by the power shaft through the ratchet means and in one direction only; a normally set brake to hold the windlass; independent means under the control of an operator to cause engagement of the clutch; and independent means under the control of the operator to release the brake.

60 2. The combination with a windlass and a

power shaft, of gearing connecting the windlass and power shaft to drive the windlass in one direction; a brake for the windlass; means to automatically hold the brake set to prevent revolution of the windlass; clutch means to drive the power shaft; means to normally hold the clutch means out of operative engagement; means under the control of an operator to bring the clutch into engagement and means under the control of an operator to release the brake.

3. The combination with a power shaft, of a driven clutch member journaled on and slidable along the power shaft; means to continually revolve the driven clutch member in one direction only; a transmitting clutch member fixed to the power shaft; means to shift the driven clutch member into and out of engagement with the transmitting clutch member; a windlass shaft journaled to revolve; a drum fixed to the windlass shaft; a hoist line fixed to and wound on the drum; gearing connecting the power shaft with the windlass shaft to revolve the windlass; a brake wheel fixed to the windlass shaft; means to normally prevent revolution of the windlass shaft in one direction relative to the brake wheel and to allow such relative revolution in the opposite direction; means to normally hold the brake wheel stationary, and means under the control of an operator to release the brake wheel.

4. A power shaft journaled to revolve; a transmitting clutch member fixed to the power shaft to revolve therewith; a clutch member journaled on and slidable along the power shaft and provided with sprocket teeth; a motor; a sprocket chain connecting the motor with the sprocket teeth to revolve the slidable clutch member; a cam member journaled on the power shaft and adapted to slide the sliding clutch member toward the transmitting clutch member; a lever connected to the cam to operate the same; a line connected to the cam lever to operate such lever, said lever being adapted to normally hold the cam in clutch releasing position; a windlass shaft; a drum fixed to the windlass shaft; gearing driven by the power shaft to revolve the windlass shaft in one direction; a brake wheel revolvable on the windlass shaft; means connecting the brake wheel with the windlass shaft to allow rotation of the brake wheel and relative to the windlass shaft in one direction only; a brake band for, and normally free from, the brake wheel; a brake lever adapted to operate the brake band to contract the same and arranged so that the weight of the lever will normally contract the brake band onto the brake wheel; and a line connected to the brake lever and adapted to lift the same to release the brake.

5. In a hoist comprising a windlass; a hoist line connected to the windlass and adapted to turn it in one direction; means to revolve

the windlass to wind the hoist line thereonto;
a brake wheel; means connecting the brake
wheel and windlass to allow relative rotation
of wheel and windlass in one direction only;
a fulcrum pin; a brake band for the brake
5 wheel; a brake lever fulcrumed on the pin
and provided with projections on opposite
sides of the pin, the ends of the brake band
being connected to the projections respective-
10 ly; a spring support for one arm of the brake
lever, the other arm of said lever being over-
balanced to descend by gravity to contract
the brake band onto the brake wheel; and an
operating line connected to the lever to co-
15 operate with the spring to move the lever to
release the brake band.

6. A hoist comprising a frame; a windlass
journalled to the frame; windlass control-
ling mechanism including a clutch and an
20 overbalanced lever for operating the clutch;
a brake wheel revoluble in one direction
relative to the windlass; a brake band for said
brake wheel; an overbalanced lever to nor-
mally hold the brake band in braking posi-
25 tion; and lines leading from an operator's
station to the levers respectively to lift the
same independently of each other.

In testimony whereof, I have hereunto set
my hand at Los Angeles, California, this 4th
30 day of December, 1928.

JACOB V. DYRR

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