E. Y. MOORE.

HOIST.

APPLICATION FILED OCT. 17, 1919.

1,348,034.

Patented July 27, 1920.

4 SHEETS—SHEET 1.

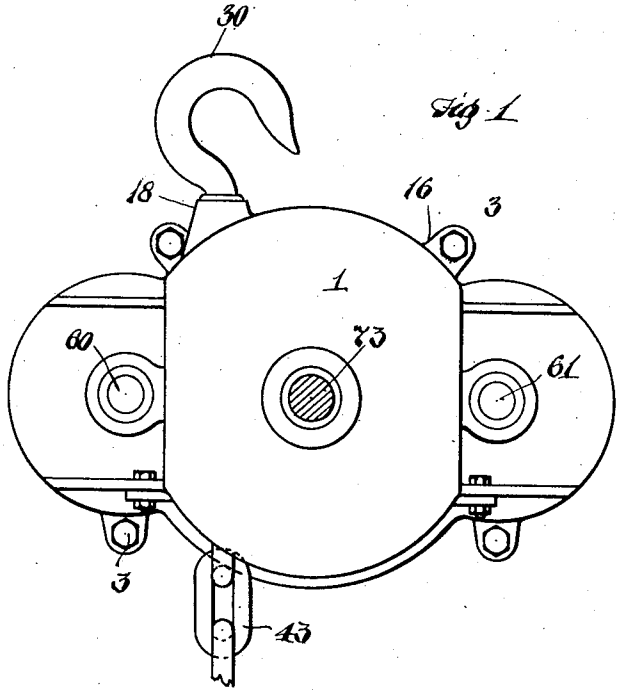


Fig. 1

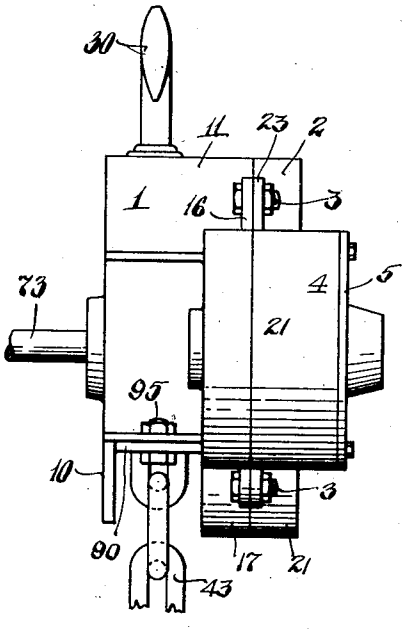
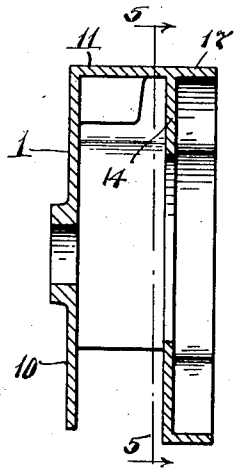


Fig. 2

Fig. 3



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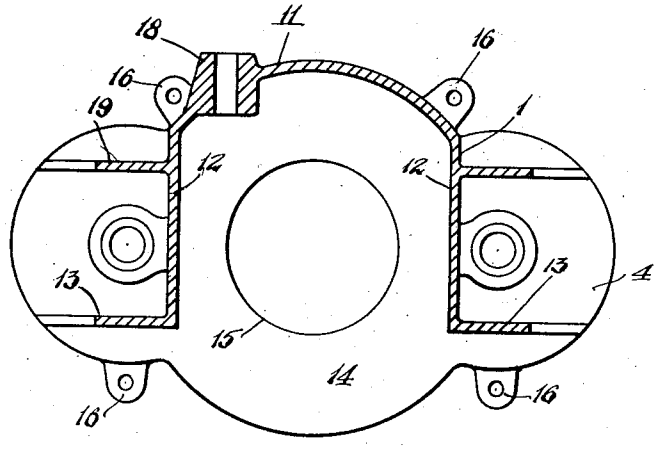


Fig. 5

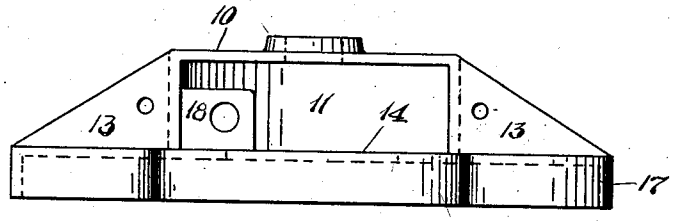


Fig. 6

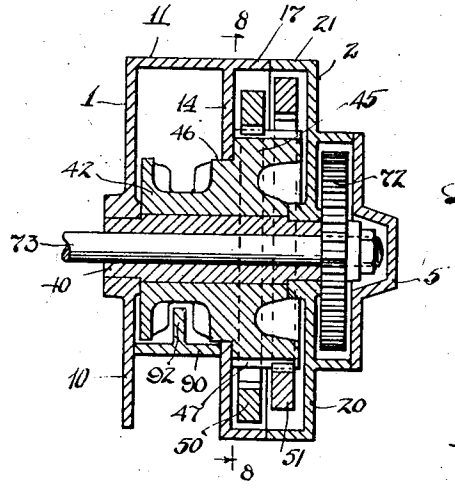


Fig. 4

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4 SHEETS—SHEET 3.

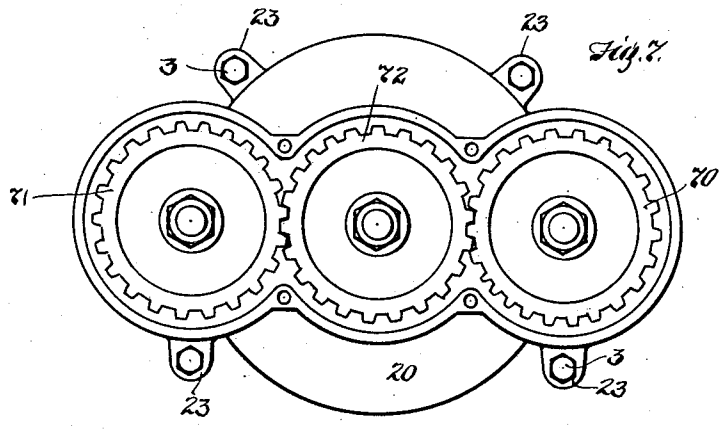


Fig. 7.

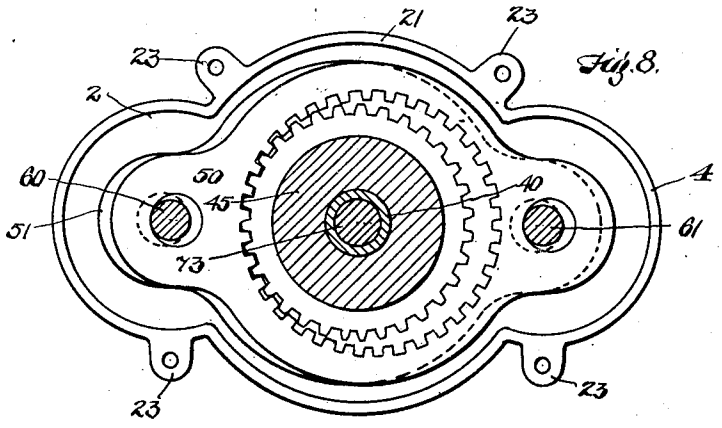


Fig. 8.

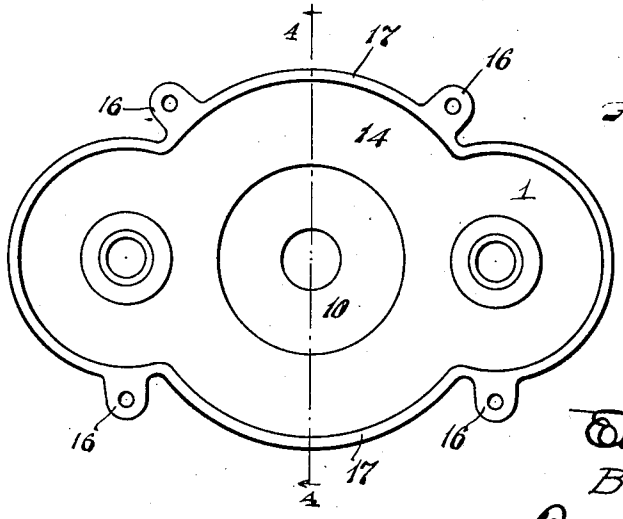


Fig. 9.

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4 SHEETS—SHEET 4.

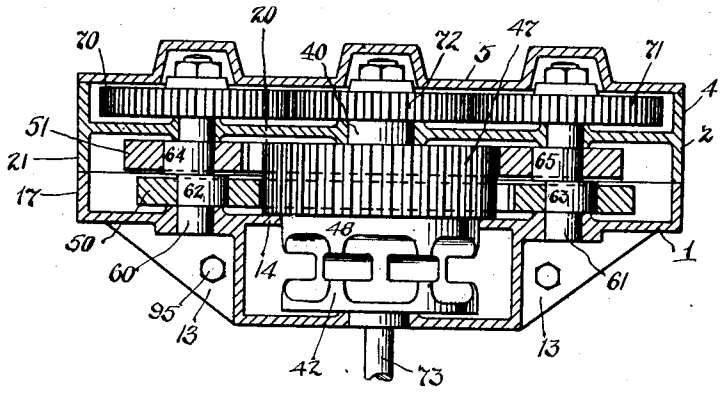


Fig. 10

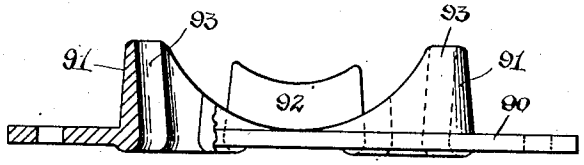


Fig. 11

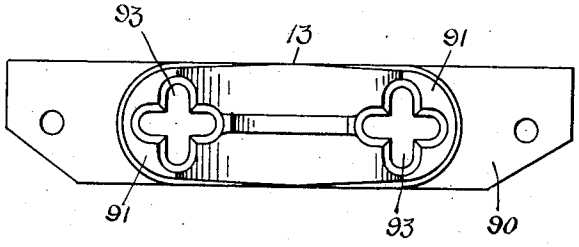


Fig. 12

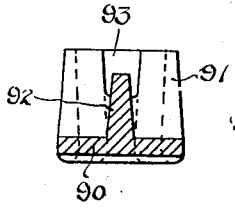


Fig. 13.

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UNITED STATES PATENT OFFICE.

EDWARD Y. MOORE, OF CLEVELAND, OHIO.

HOIST.

1,348,034. Specification of Letters Patent. Patented July 27, 1920.

Application filed October 17, 1919. Serial No. 331,416.

To all whom it may concern:

Be it known that I, EDWARD Y. MOORE, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Hoists, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My prior Patents Nos. 757,333, 794,997 and 946,253, disclose and claim a very efficient hoist, wherein there is a lift wheel having a spur gear which is engaged and slowly rotated by an internally toothed yoke which is given a circular translation about the spur gear. The circular translation of the yoke is caused by eccentrics which are rotated by gearing connected with a driving shaft. Large numbers of such hoists have gone into use under the name of "Cyclone-hoist." Experience has demonstrated, however, that there are certain uses to which such hoist is put, notably in connection with drilling for oil or gas, where material is forced into the hoist from below and has a deleterious effect on the gearing, eccentrics, and other moving parts of the hoist.

The object of this invention is to provide a hoist operating on the general principle of the "Cyclone-hoist" but provided with simple and effective means for substantially inclosing the working parts and preventing the access thereto of dirt, grit, etc.

My invention, by which I accomplish the above mentioned objects, is hereinafter more fully described in connection with the accompanying drawings and the essential characteristics are set out in the claims.

In the drawings, Figure 1 is a side elevation of a hoist embodying this invention, the hand chain wheel being removed; Fig. 2 is an end elevation of the same; Fig. 3 is a transverse section through the forward housing members; Fig. 4 is a vertical section through a portion of the structure of Fig. 2; Fig. 5 is a transverse section, as indicated by the line 5—5 on Fig. 3; Fig. 6 is a bottom view of the housing member of Figs. 3 and 5; Fig. 7 is a rear face view of the hoist with the rear side plate removed; Fig. 8 is a view partly in section, of the rear housing member containing a portion of the mechanism; Fig. 9 is a rear view of the forward housing member; Fig. 10 is a horizontal section through the hoist; the hand chain wheel being removed; Fig. 11 is a side elevation, partly sectional, of the bottom plate for boxing in the lift wheel; Fig. 12 is a plan of the same; and Fig. 13 is a cross section of such plate, as indicated by the line 13—13 of Fig. 12.

The frame of my hoist consists primarily of two box-like members 1 and 2, bolted together by bolts 3 which pass through ears on the members. The rear member 2 carries an extended housing 4 for the gears, and is covered by a frame plate 5. As shown in Figs. 2 to 5, the forward member 1 has a front plate 10, a top portion 11, and vertical end walls 12, terminating in lower outward horizontal flanges 13, and having corresponding upper flanges 19. This member also has a wall 14 with a circular opening 15 in it, and an inclosing peripheral wall 17 extending rearwardly of the wall 14. Extending upwardly from the member are ears 16 through which the bolts 3, heretofore mentioned, extend. The member 2 has a vertical wall 20 and an inclosing peripheral wall portion 21 extending forwardly therefrom, which abuts the wall 17 and has ears 23 coacting with the ears 16 and receiving the bolts 3. The frame described is suitably supported, as for example, by the hook 30, which has a downwardly extending shank swiveled in a boss 18 rising from the top portion of the member 1.

Extending across the hoist frame and rigidly mounted in central bosses on the side plates 10 and 20 is a stationary sleeve 40. Journaled on this sleeve and partly within the chamber provided by the frame member 1, is a pocket wheel 42 over which the left chain 43 extends. In the particular form illustrated, the raising portion of this lift chain depends directly beneath the shank of the hook 30, while the idle portion (not shown) depends on the other side of the lift wheel 42.

The lift wheel 42 constitutes the forward or pocket portion of a preferably integral member, having a rear or gear portion 45 within the intermediate chamber formed by the abutting walls 17 and 21.

Between these portions 42 and 45 is an intermediate circular portion at least as large as the pocket portion, which makes a freely running but close fit with the edge of the opening in the plate 14. The portion 45 is formed with spur gear teeth 47 and is materially larger than the portion 46, the forward end of the gear being closely

adjacent to the rear face of the wall 14. This approximate contact between the wall 14 and the portions 46 and 47 prevents the admission of dust or other material into the intermediate chamber, which may have found lodgment within the forward chamber containing the pocket portion of the lift wheel.

Engaging the gear 47 are two internally toothed yokes 50 and 51 mounted side by side and meshing therewith at diametrically opposite points. Each yoke is provided with two cylindrical openings in which are eccentrics on two shafts 60 and 61. Each shaft has two eccentrics extending in opposite directions and engaging the respective yokes, the eccentrics which occupy the same yoke extending in the same direction. That is to say, on the shafts 60 and 61 are eccentrics 62 and 63 respectively extending in the same direction and engaging the yoke 50, and on these same shafts are eccentrics 64 and 65 extending in the same direction, which is opposite to the direction of the eccentrics 62 and 63, the eccentrics 64 and 65 engaging in circular openings in the yoke 51.

It will be seen from the above described construction that if the shafts 60 and 61 are simultaneously rotated the yokes will be correspondingly gyrated, resulting in a slow rotation of the lift wheel 42. The relative rotation of the lift wheel 42 to that of the eccentric shafts is in the ratio which the difference between the number of teeth on a yoke and the number of teeth on the lift wheel bear to the number of teeth on the lift wheel. This is more fully explained in the patents heretofore referred to.

To simultaneously rotate the shafts 60 and 61, I mount these shafts in bearings in the wall 14 and in the wall 20, and extend them beyond the latter wall and there provide them with spur gears 70 and 71, which mesh with a central spur gear 72 on a driving shaft 73 which extends freely through the sleeve 40 and is provided on its other end with a hand wheel or other mechanism (not shown) for operating it. Accordingly the rotation of the hand wheel causes the slow rotation of the lift wheel 42, as desired.

It will be noted that the gyrating yokes 50 and 51 are incased at their periphery by the continuous walls 17 and 21 and at the rear by the vertical wall 20. At the front they are incased by the vertical wall 14, the circular opening 15 of which makes a close connection with the cylindrical portion 46 of the lift wheel 42. This complete inclosure of these parts prevents access of dirt or other material to the eccentrics or gear teeth and thus protects the parts.

Access of dirt to the lift wheel itself does not cause much harm, but to reduce such access as much as possible, I provide a bottom member for the chamber occupied by the lift wheel proper. This bottom member consists of a plate portion 90 abutting the under sides of the flanges 13 between the walls 10 and 14, and bolted thereto and having on its upper side hollow bosses 91 through which the chains pass, while between these bosses a vertical web 92 extends into the groove on the lift wheel. The bosses 91 are curved on their upper sides concentrically with the lift wheel, as shown in Fig. 11. The internal passageway of the bosses may flare toward the top and may readily have a quatrefoil contour, as shown at 93 in Fig. 12, to accommodate the chain links extending in each direction.

It will be seen that in the hoist described all the working parts are effectively inclosed, preventing damage from dirt or other foreign matter. The gyrating yokes and their operating and operated members are all effectively incased within the chamber of the frame member 2. The spur gears are inclosed within the casing provided therefor, and the lift wheel is protected by the bottom plate and chain-embracing bosses. The hoist has the efficiency heretofore present in Cyclone hoists and has also immunity from dirt and grit, which in some uses is very advantageous.

I claim:

1. In a hoist, the combination of a frame made up of two box-like castings bolted together face to face, each of said castings having a vertical wall with a central bearing opening and peripheral walls inclosing said vertical walls, the forward one of said castings having an intermediate wall with a central opening and forming two chambers within said frame, the rear one of said castings having its peripheral wall projecting rearwardly of the vertical plate therein, said intermediate wall and the vertical wall of the rear casting having alined bearings, stub shafts mounted within said bearings having gears thereon, a third casting secured to said rearwardly projecting peripheral wall and constituting therewith an inclosed housing for said gears, a driving shaft within the bearing openings in said vertical walls, having a driving gear thereon in mesh with said first named gears, a lift wheel surrounding said driving shaft comprising a single integral member having pockets in one chamber and gear teeth in the other chamber and an intermediate circular zone closely coacting with the edge of the opening in the intermediate wall, said gear teeth being formed on an enlarged portion and constituting a driven gear, and yokes actuated by said stub shafts in engagement with said driven gear.

2. In a hoist, the combination of an inclosed housing composed of two castings, one comprising a substantially hollow inclosed box having forward and intermediate walls, the latter containing a central

opening, and a peripheral wall, constituting a forward chamber, said peripheral wall projecting rearwardly of said intermediate wall; the other casting comprising a rear vertical wall having a forwardly extending peripheral inclosing wall adapted to be secured to the rear of the corresponding wall of said first named casting, constituting a rear chamber, a sleeve mounted in said forward and rear vertical walls extending through the opening in said intermediate wall, a shaft journaled therein and extending through said forward and rear chambers, a lift wheel surrounding said sleeve comprising an integral member having a portion containing chain pockets within the forward chamber, an intermediate portion coacting closely with the edge of said opening in the intermediate vertical wall, and an enlarged gear portion within the rear chamber adjacent to said intermediate wall, whereby foreign matter is prevented from entering said rear chamber, and driving mechanism within said rear chamber between said shaft and said gear portion.

3. In a hoist, the combination of an inclosed housing, composed of two principal castings, one comprising a substantially hollow inclosed box having a forward vertical wall, an intermediate vertical wall containing a central opening, a peripheral inclosing wall, and a bottom plate having chain openings, said plate being removably secured between said vertical walls, constituting an inclosed forward chamber, said peripheral inclosing wall projecting rearwardly of said intermediate wall; the other casting comprising a rear vertical wall having a forwardly extending peripheral inclosing wall adapted to be secured to the rear of the corresponding wall of said first named casting, to constitute an intermediate chamber, said rear vertical wall having a rearwardly extending peripheral inclosing wall, a rear plate removably secured thereto, to constitute a rear chamber; a sleeve mounted in said forward and rear vertical walls extending through the opening in said intermediate wall, a shaft journaled therein and extending through said forward and intermediate chambers and projecting into said rear chamber, a lift wheel surrounding said sleeve comprising an integral member having a portion containing chain pockets within the forward chamber, an intermediate portion coacting closely with the edge of said opening in the intermediate vertical wall, whereby foreign matter is prevented from entering said intermediate chamber, an enlarged gear portion in said intermediate chamber, and driving mechanism within said intermediate and rear chambers between said shaft and said gear portion.

4. In a hoist, the combination of a frame composed of two main castings, bolted together face to face, said castings having a central vertical plate portion, and having peripheral wall portions in abutting relation, one of said castings having a forwardly extending peripheral wall and a front vertical wall, bearings in said front wall and the wall of the other casting, a shaft mounted in said bearings and extending across the two internal chambers provided by the frame, a lift wheel surrounding said shaft comprising a single member having a pocket portion in one chamber and a driven gear portion in the other chamber.

5. In a hoist, the combination of an inclosed housing, composed of two principal castings, one comprising a substantially hollow inclosed box having a forward vertical wall, an intermediate vertical wall containing a central opening, a peripheral inclosing wall, and a bottom plate having chain openings, said plate being removably secured between said vertical walls, constituting an inclosed forward chamber, said peripheral inclosing wall projecting rearwardly of said intermediate wall; the other casting comprising a rear vertical wall having a forwardly extending peripheral inclosing wall adapted to be secured to the rear of the corresponding wall of said first named casting, to constitute an intermediate chamber, said rear vertical wall having a rearwardly extending peripheral inclosing wall, a rear plate removably secured thereto, to constitute a rear chamber, a shaft extending through said forward and intermediate chambers and projecting into said rear chamber, a lift wheel on said shaft occupying said forward and intermediate chambers, and driving mechanism therefor in said intermediate and rear chambers.

6. In a hoist, the combination of an inclosed housing composed of two principal castings, one comprising a substantially hollow box having forward and intermediate vertical walls, and a peripheral wall terminating in lower outwardly extending flanges, and a bottom plate having chain openings, said plate being removably secured to said flanges between said vertical walls, constituting a completely inclosed forward chamber, said peripheral wall projecting rearwardly of said intermediate wall; the other casting comprising a rear vertical wall having a forwardly extending peripheral inclosing wall adapted to be secured to the rear of the corresponding wall of said first named casting, constituting a rear chamber.

In testimony whereof I hereunto affix my signature.

EDWARD Y. MOORE.