No. 874,238. PATENTED DEC. 17, 1907.

E. PUTNAM.

HOISTING APPARATUS.

APPLICATION FILED FEB. 8, 1907.

2 SHEETS—SHEET 1.

Fig. 1

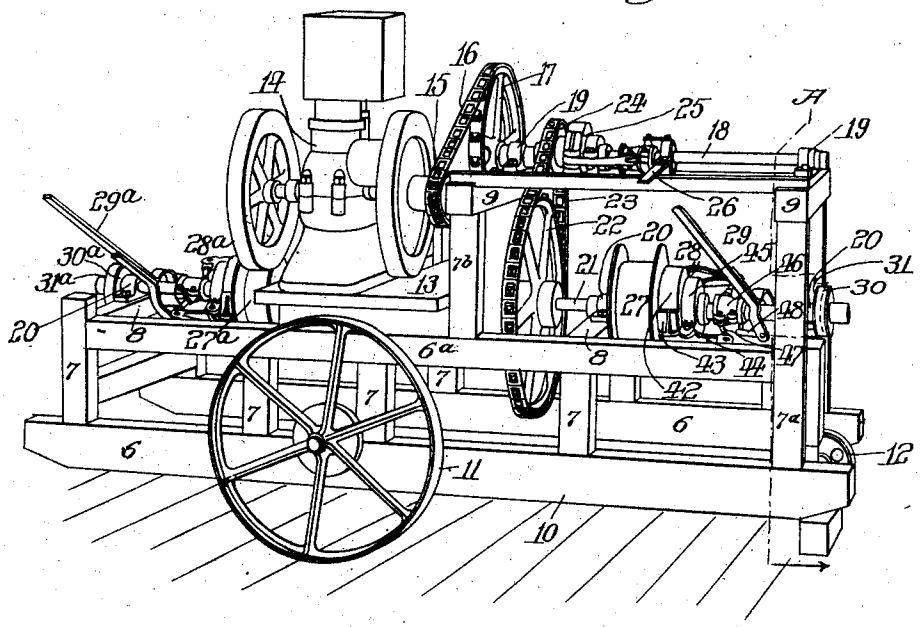


Fig. 2

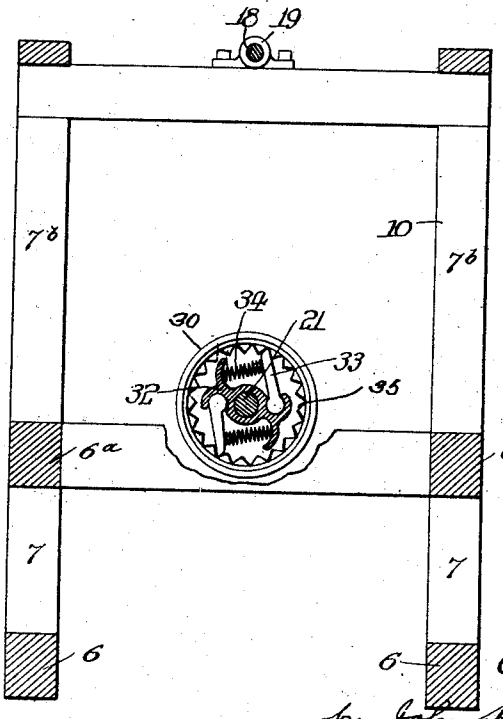


Fig. 3

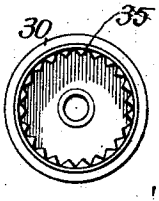
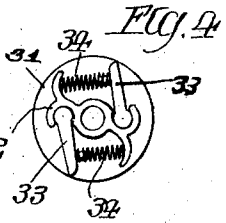


Fig. 4



Witnesses:
H. G. Barrett
M. S. Reeder

Inventor:
Edmond Putnam,
by John Howard McElroy,
his Attys

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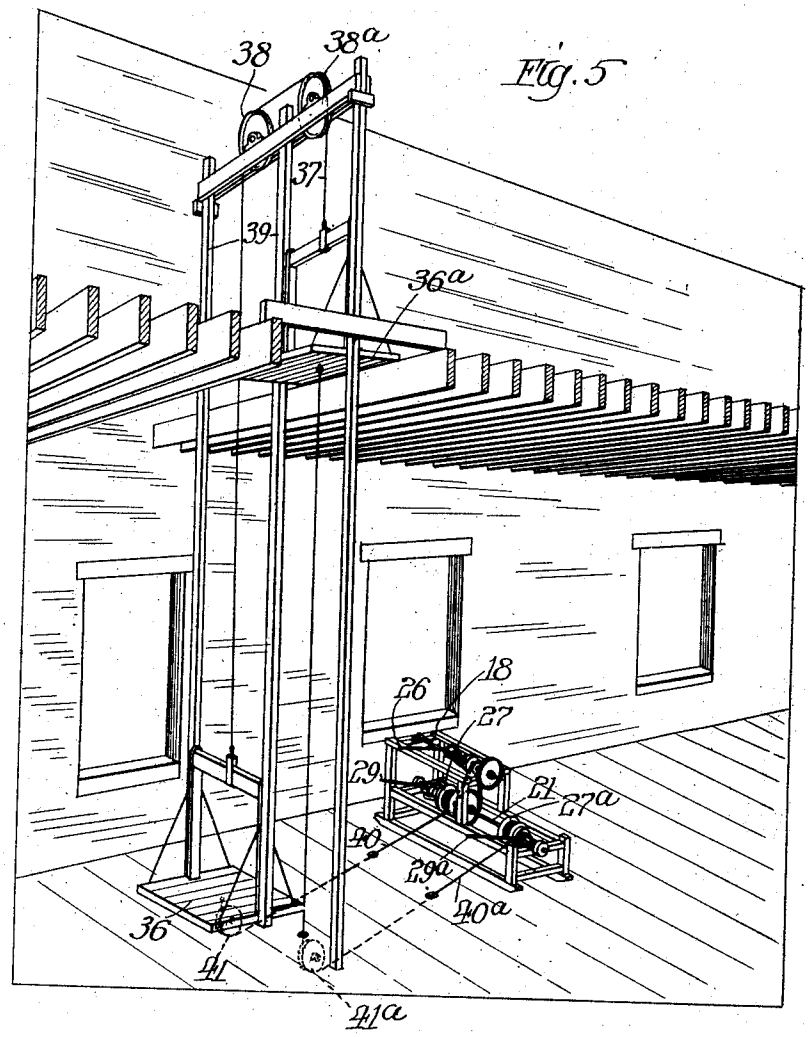
2 SHEETS—SHEET 2.

Fig. 5



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UNITED STATES PATENT OFFICE.

EDMOND PUTNAM, OF ROSSVILLE, ILLINOIS.

HOISTING APPARATUS.

No. 874,238. Specification of Letters Patent. Patented Dec. 17, 1907.

Application filed February 8, 1907. Serial No. 356,398.

To all whom it may concern:

Be it known that I, EDMOND PUTNAM, a citizen of the United States, and resident of Rossville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Hoisting Apparatus, of which the following is a full, clear, and exact specification.

As is well known, hoisting apparatus has heretofore usually been operated by steam, water power or electricity, in which case the engine or motor is started or stopped at each starting or stopping of the hoist or cage. Obviously, such an apparatus is not adapted for use with gas or gasolene engines, which it is impracticable to start and stop frequently, and especially under loads.

My present invention is designed to produce a hoist adapted to be driven from a continuously-rotating shaft, such as the driving shaft of a gas or gasolene engine, which ordinarily rotates always in the same direction, and resides in a certain novel combination of elements which will be described at length in the specification, and particularly pointed out in the claims.

To illustrate my invention, I annex hereto two sheets of drawings, in which the same reference characters are used to designate identical parts in all the figures, of which,—

Figure 1 is a perspective view of my invention without the ropes and cages, showing it as detached and ready for transportation; Fig. 2 is a section substantially on the line A—A of Fig. 1; Fig. 3 is an elevation of the interior of one of the detent disks; Fig. 4 is a similar view of one of the pawl-carrying disks coöperating therewith; and Fig. 5 is a perspective view showing the complete mechanism arranged for a pair of connected cages.

In carrying out my invention, I provide a suitable framework 10, which may be of any design desired, and is made up of a pair of longitudinal bottom sills 6, extending the entire length of the machine, a similar pair of intermediate longitudinal sills 6^a supported therefrom by suitable struts or posts 7, and a plurality of transverse sills 8 on the level of the sills 6^a. Another pair of transverse sills 9 are supported at one end of the top of the framework by the struts 7^b and the elongated end posts 7^a. The entire frame is mounted upon a pair of large wheels 11 and a small caster wheel 12 at one end, so that the frame can be tilted for the purpose of moving it up and down inclines. At a suitable point on the frame, I provide the platform 13, upon which is secured the gas or gasolene engine 14, the shaft of which is provided with a belt or sprocket pinion 15, which, through the medium of the belt or sprocket chain 16, drives the pulley- or sprocket-wheel 17, which is secured upon the shaft 18 mounted to rotate in suitable bearings 19 carried by the framework. Of course, it will be apparent that while the engine is in operation, the shaft 18 is continuously rotated in the same direction.

Journaled in suitable bearings 20 at the ends, and at an intermediate point in the framework, is the countershaft 21, which is parallel to and preferably beneath the shaft 18. This shaft is driven from the shaft 18 by suitable clutch gearing connections, such, for instance, as the sprocket wheel 22 secured to the shaft 21, the sprocket chain 23, the sprocket pinion 24 loosely mounted on the shaft 18 and adapted to be clutched thereto by the clutch mechanism 25, which may be of any desired construction, and which is thrown into and out of operation by means of the clutch lever 26. By means of these connections, it will be apparent that the shaft 21 can be rotated in the same direction as the shaft 18, when desired, but at a lower rate of speed, it, of course, being essential to reduce the rate of rotation relative to the engine shaft.

Loosely mounted upon the shaft 21, and adjacent some of the intermediate bearings, are one or more winding drums 27 and 27^a, which, like the sprocket wheel 24, are arranged to be temporarily secured to the shaft 21 by means of the clutch mechanisms 28 and 28^a, which are operated by the levers 29 and 29^a. To prevent the backward rotation of the shaft 21 under the stress of a load when the drums 27 or 27^a are clutched to the shaft 21, I provide suitable detent mechanism, such as indicated in Figs. 2 to 4, where Fig. 3 shows the interior of ratchet disks 30 and 30^a, of which there is preferably one secured on each end of the shaft 21, so as to rotate therewith. Detent disks 31 and 31^a are preferably made integral with the bearings 20, and have formed thereon the bearing flanges 32, in which are pivoted the dogs 33, which are held by the springs 34 yieldingly in engagement with the teeth 35 of the ratchet disks or cups 30 and 30^a, so that while the shaft is

free to rotate in one direction, it is held from rotation in the opposite direction.

In Fig. 5, I have illustrated my hoisting apparatus, with the engine omitted for the purpose of clearness, arranged in connection with the pair of platforms or cages 36 and 36ª, which are suspended by a rope or cable 37 passing over the sheaves 38 and 38ª suitably mounted at the top of the well formed by the standards 39 and the necessary apertures in the floors, through which the hoist passes, it, of course, being understood that it can be utilized through several floors, instead of the single floor shown in the drawings. The bottoms of the cages 36 and 36ª have secured thereto the cables or ropes 40 and 40ª, which pass over sheaves 41 and 41ª, and are secured to the winding drums 27 and 27ª, respectively.

The operation of this apparatus, with the double-cage system, will be readily apparent: Suppose the apparatus, except the engine, is at rest, with the cage 36 at the bottom and the cage 36ª at the top. The clutch lever 29 is operated to release the winding drum 27 from the shaft 21, so that it will be free to rotate backward to unwind, and the lever 29ª is shifted to connect the winding drum 27ª to the shaft 21, so that the rope will be wound up on the drum 27ª. The lever 26 is then operated to clutch the shaft 18 to the shaft 21, when the cable 40ª will be wound up on the drum 27ª, thereby drawing down the cage 36ª, and at the same time raising the loaded cage 36. When the loads are at the top, the lever 26 is thrown in the other direction to unclutch the shafts 18 and 21, and the detent mechanisms at the ends of the shaft hold the loaded cage in the elevated position against the weight of the load. When the cages are to be reversed, the position of the handles 29 and 29ª is reversed, and the handle 26 then operated again to clutch the shafts 18 and 21, when the cages will move in the opposite direction.

Of course, it will be understood that the hoists can be operated singly, in which case the cable from the winding drum will run over a sheave at the top of the well and be secured to the top of the cage. Then the cage is elevated by winding up the cable on its associated drum, and when it reaches the top, the shaft 21 is stopped and the cage is held elevated by the detent mechanism. When it is to be lowered, the clutch mechanism is shifted, so that the winding drum can rotate on the shaft in the proper direction to unwind the cable, and the clutch mechanism may be used as a braking mechanism to prevent the too rapid descent of the cage, as the clutch mechanism employed is of the customary double friction-clutch pulley character, in which a smooth periphery of the pulley 42 secured to the winding drum is engaged by shoes 43 carried by levers 44 pivoted in a yoke member 45 secured upon the shaft 21 and swung into and out of engaging position by reason of the sliding of the sleeve 46 splined upon the shaft, the sleeve 46 being connected to the end of the levers 44 by the links 47, and the lever 29 being connected to the sleeve 46 by links 48.

While I have shown and described my invention as embodied in the form which I at present consider best adapted to carry out its purposes, it will be understood that it is capable of modifications, and that I do not desire to be limited in the interpretation of the following claims, except as may be necessitated by the state of the prior art.

What I claim as new, and desire to secure by Letters Patent of the United States, is:—

1. In a hoisting apparatus, the combination with the framework, of the parallel driving and driven shafts journaled in bearings therein, the motor carried by the framework adapted to rotate the driving shaft continuously in one direction, gearing connecting the driving and the driven shaft, a clutch included in said gearing, a winding drum loosely mounted on the driven shaft, a detent mechanism interposed between the framework and the driven shaft to prevent its backward rotation, and a clutch mechanism interposed between the winding drum and the driven shaft.

2. In a hoisting apparatus, the combination with the framework, of the parallel driving and driven shafts, the driven shaft being journaled in two end bearings as well as an intermediate bearing, the motor carried by the framework adapted to rotate the driving shaft continuously in one direction, gearing connecting the driving and the driven shaft and located adjacent the intermediate bearing, a clutch included in said gearing, a pair of winding drums located on the driven shaft toward the ends thereof, a detent mechanism interposed between the framework and one end of the driven shaft to prevent its backward rotation, and a pair of clutch mechanisms interposed between the winding drums and the driven shaft.

3. In a hoisting apparatus, the combination with the framework having the bottom and intermediate longitudinal sills extending the entire length of the framework, and the transverse bearing sills at the top of the framework on one end thereof, of the driving shaft journaled in bearings formed on the transverse sills, the gas engine mounted on a platform located on the other end from the driving shaft, gearing between the engine and the driving shaft, the driven shaft extending beneath the engine and journaled in bearings formed slightly above the level of the upper pair of elongated sills, gearing connecting the driving and the driven shaft, a clutch included in said gearing, a pair of winding drums loosely mounted on the

driven shaft near the ends thereof, a pair of detent mechanisms interposed between the framework and the driven shaft at the ends of the shaft to prevent its backward rotation, and a pair of clutch mechanisms interposed between the winding drums and the driven shaft.

In witness whereof, I have hereunto set my hand and affixed my seal, this fourth day of February, A. D. 1907.

EDMOND PUTNAM. [L. S.]

Witnesses:

THOS. J. ALLESON,

W. B. REDDEN.