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C. R. OTIS.

Improvement in Steam-Hoisting Apparatus.

No. 131,894. Patented Oct. 1, 1872.

Fig: 1

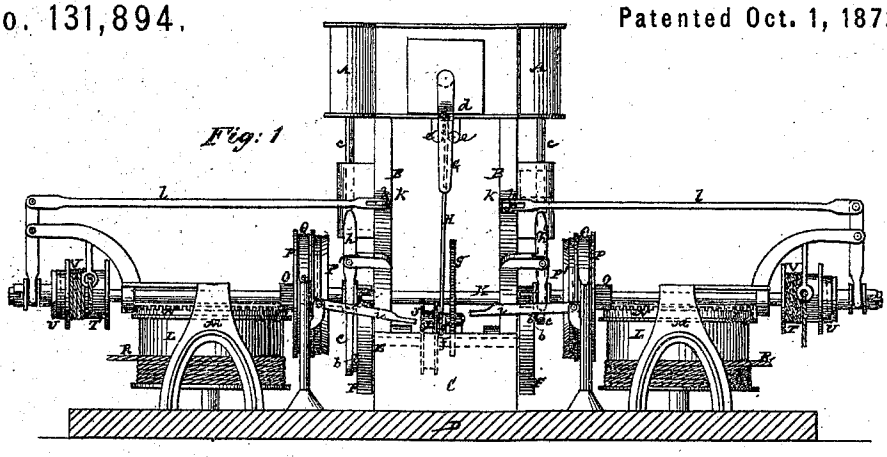
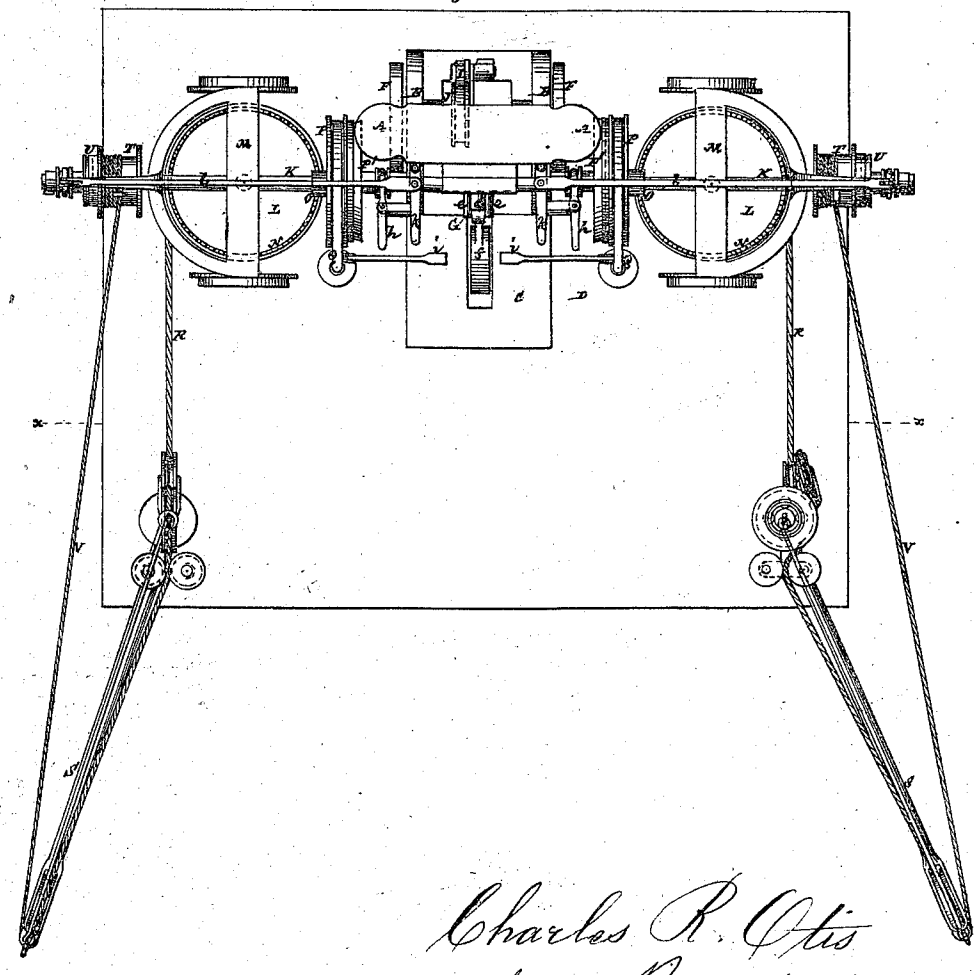


Fig: 2



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AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

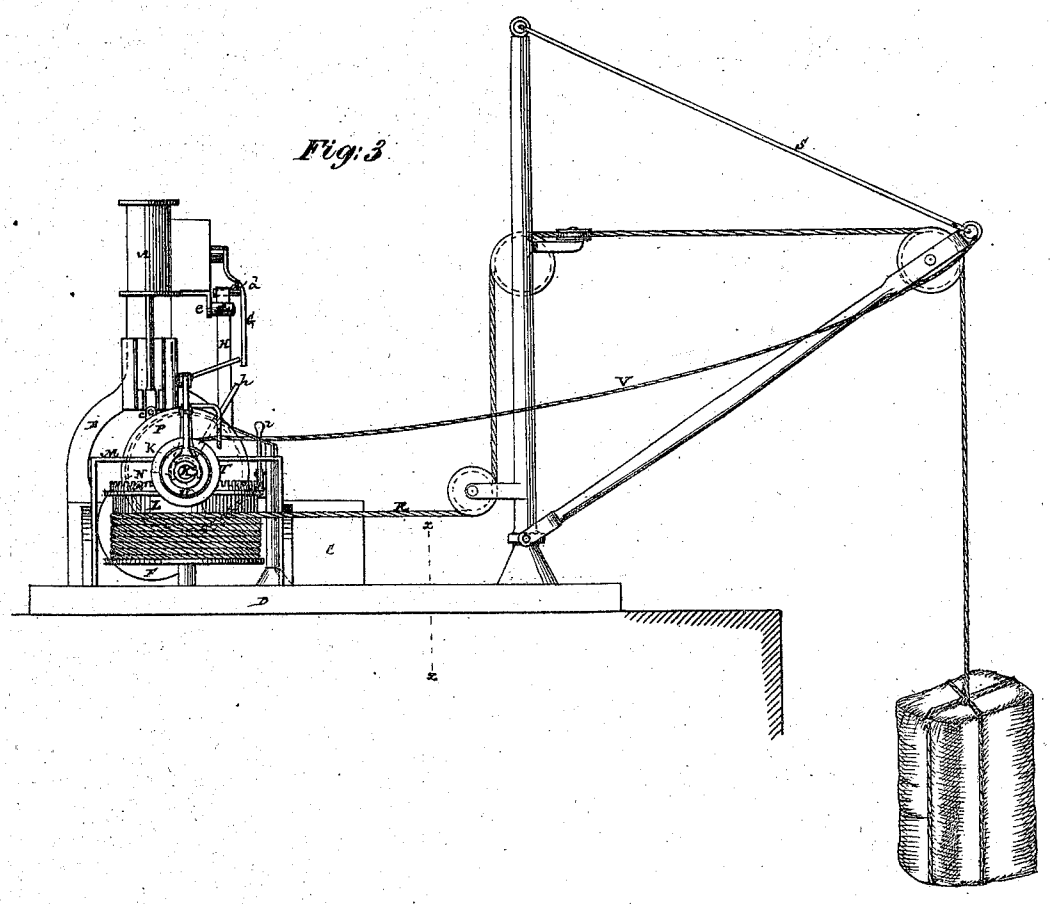
2 Sheets--Sheet 2.

C. R. OTIS.

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Fig. 3



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UNITED STATES PATENT OFFICE.

CHARLES R. OTIS, OF YONKERS, NEW YORK.

IMPROVEMENT IN STEAM HOISTING APPARATUS.

Specification forming part of Letters Patent No. **131,894**, dated October 1, 1872.

CASE F.

To all whom it may concern:

Be it known that I, CHARLES R. OTIS, of Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Steam Hoisting Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a front elevation of the engine, with its hoisting attachments, at the line *x x* in Figs. 2 and 3; Fig. 2 is a plan of the same, together with a pair of swinging cranes connected therewith; and Fig. 3 is a side or end view of the whole apparatus shown in Fig. 2.

Similar letters of reference indicate corresponding parts.

This invention is here shown as applied to a steam hoisting apparatus for loading and unloading purposes by means of swinging cranes or derricks — as, for instance, in loading and unloading canal and other boats, vessels, or vehicles; but it is not restricted to such application or use, and the mechanism of which it is composed may, in many or most of its features, be adapted for different hoisting purposes. The invention consists in various combinations and arrangements of mechanism, including one or more vertical hoisting-drums, swinging cranes, and drums with guy-ropes for operating the latter, all deriving their motions from the same hoisting-engine, whereby great facility is afforded for hoisting, lowering and delivering goods, during a continuous motion of the engine in either direction, substantially as hereinafter described.

A A represent the cylinders of a double-cylinder steam hoisting-engine, said cylinders and their connecting steam-chest being, preferably, arranged overhead on standards B B of a base, C, which rests on a bed-plate, D. E is the engine-shaft, having disks, wheels, or pulleys F F fast to its opposite ends, and provided with wrist-pins *b* for attachment of the piston and connecting-rods *c* of the engine, by which rotary motion is communicated to said shaft. G is the lever for operating the stopping, starting, and reversing valve of the engine. Said lever has attached to it, at *d*, a cord or flexible strap, H, arranged to pass down between rollers or guides *e e* and connected below with a weighted lever, *f*, of a brake, I, applied to a brake-wheel, J, upon the engine-shaft, so that when the lever G occupies a vertical or pendent position, which is when the engine is stopped, the brake is applied to the engine-shaft, but when said lever is turned up to the right or to the left, according to the direction in which it is required to run the engine, the brake is released by the pull of the strap H on its lever. K is a counter-shaft, arranged to occupy a parallel position with the engine-shaft in front of and at a higher elevation than the latter. This shaft K receives its motion by a spur-wheel, *g*, from a pinion on the engine-shaft, and it is of a length which causes it to extend a considerable distance beyond both sides of the engine-frame. L L are vertical hoisting-drums—that is, drums having vertical axes. These drums are arranged immediately below the extended portions of the counter-shaft K on both or opposite sides of the engine, and work within independent frames M M. Each of them is mounted with a crown-wheel, N, driven, as hereinafter described, by pinions O on the outer faces of the loose halves or portions P of the revolving friction-clutches P P′ and P P′, arranged upon the counter-shaft K. In some cases the counter-shaft K may be below the hoisting-drums, and the wheels N and pinions O be arranged accordingly, the same relative arrangement of the engine-shaft, counter-shaft, and hoisting-drums, otherwise being similar, and the effect produced the same. The portion P′ of either friction-clutch, P P′ continuously rotates with the counter-shaft K and has a sliding action thereon by means of a feather-and-clutch lever, *h*, for the purpose of communicating motion to or releasing from action either loose portion P of the clutch and so setting in motion or freeing the hoisting-drums. Brakes Q Q, operated by foot or hand levers *i i*, may be applied to the loose portions P P of the clutches for arresting or holding the drums when the driving portions P′ P′ of the clutches are relieved from friction on the loose portions P P. By reason of the arrangement of the hoisting-drums L L in a vertical position, either of which may be put into operation as required, the

hoisting-ropes R R may not simply be extended any required distance to the point or place of operation, but be spread out laterally or run at any angle horizontally in relation with the drums, without interfering with their proper courses on the drums when winding or unwinding; thus, they may be run out to work over or in connection with swinging cranes or derricks S S, arranged at a considerably greater distance apart than the hoisting-drums, or out of straight line with the latter, said derricks being suitably provided with pulleys for guiding the hoisting-ropes. This will be found a very convenient arrangement for loading and unloading barges on canals, a crane being disposed both fore and aft and each being capable of independent operation as regards its hoisting mechanism, and without any necessity of stopping the engine when temporarily ceasing to hoist or lower goods. To swing the cranes in or out, as required, for the purposes of loading and unloading—as, for instance, from the wharf to the boat or from the latter to the wharf—I arrange on the outer ends of the extended portions of the counter-shaft K loose drums T T, having one-half of a friction-clutch, U, fast to their one end, and communicate motion to said drums independently of each other, as required, by sliding the other halves of the clutches in along the counter-shaft with which they rotate by means of a feather, levers *k k*, and rods *l l*, serving to adjust the sliding portions of the clutches in or out, as required. Guy ropes or chains V V are connected at their one end to the drums T T, and at their other end to one side of the jib of either crane S S, so that, on rotating either drum T to wind on its rope V, the jib of the crane, to which said rope belongs, will be swung inward, and, on freeing said drum from its driving connection with the shaft K by release of its clutch U, the crane under operation will swing back to its normal position by suitably hanging it for such purpose, or by reason of its deflection of the hoisting-rope. The friction-clutches P P′ and U also serve to retard as required the drums L and T when in motion.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination, with the hoisting engine, of one or more vertical hoisting-drums, L, and shaft K, for giving motion to the same, when said shaft is arranged in relation with the drum or drums, substantially as specified.

2. The combination of two or more independent vertical hoisting-drums, L L, the counter-shaft K, the gears N O, the friction-clutches P P′ P P′, and the engine-shaft E, essentially as described.

3. The combination, with one or more vertical hoisting-drums, L, of one or more swinging cranes, S, substantially as specified.

4. The combination of one or more drums, T, and friction-clutches U with one or more swinging cranes, S, guy-ropes V, and hoisting-drum or drums L, essentially as specified.

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Witnesses:

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