G. SANFORD.

Hoisting Apparatus.

No. 212,989. Patented Mar. 4, 1879.

Fig 1.

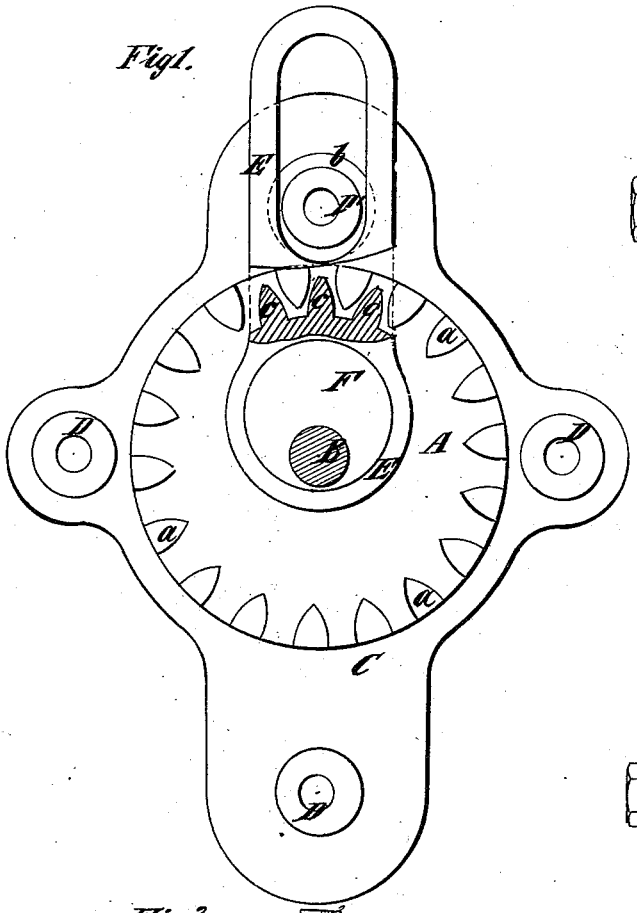


Fig 2.

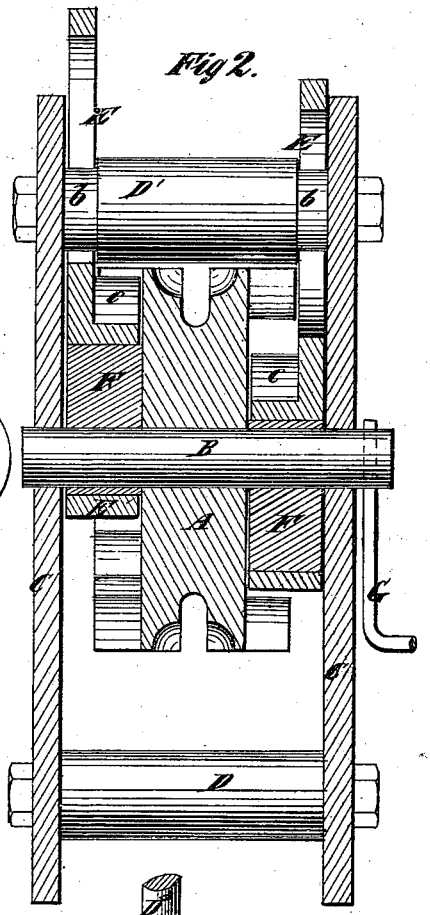


Fig 3.

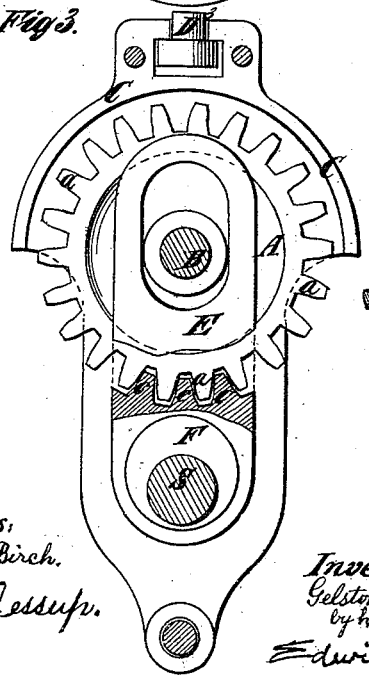
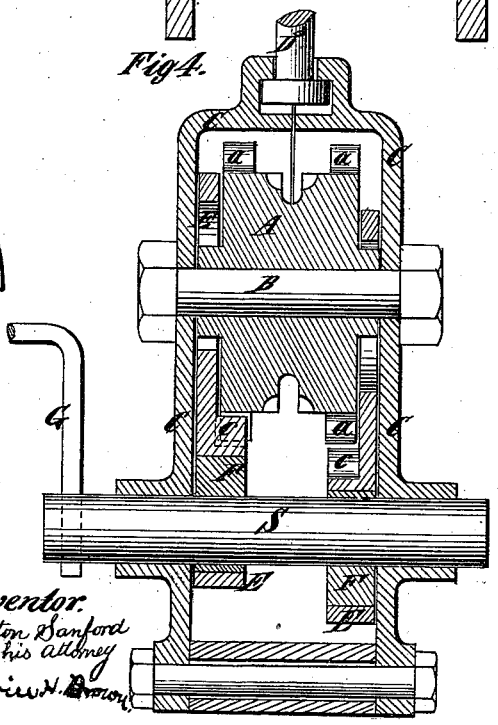


Fig 4.



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UNITED STATES PATENT OFFICE.

GELSTON SANFORD, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. **212,989**, dated March 4, 1879; application filed January 21, 1879.

To all whom it may concern:

Be it known that I, GELSTON SANFORD, of Brooklyn, in Kings county, and the State of New York, have invented certain new and useful Improvements in Hoisting Apparatus, of which the following is a specification:

The object of my invention is to produce a simple, cheap, and effective hoisting apparatus which will not turn backward by reason of the weight or draft upon it.

To this end it consists in the combination of a hoist wheel or pulley provided with gear-teeth, levers provided with gear-teeth, and reversely-set eccentrics for carrying the levers, to alternately engage with and operate the hoist-wheel, whereby the desired end is attained.

The invention also consists in details of construction to be hereinafter explained.

In the accompanying drawings, Figure 1 is a side view of a hoisting apparatus embodying my invention, with one side plate removed and part of the adjacent levers broken away. Fig. 2 is a central vertical section of the same. Fig. 3 is a side view of a modified form of such hoisting apparatus, with one side plate removed and the adjacent lever partly in section; and Fig. 4 is a central vertical section of the latter.

Similar letters of reference designate corresponding parts in all the figures.

Referring to Figs. 1 and 2, A designates a hoist wheel or pulley, loosely mounted on a shaft, B, supported in bearings in a frame, shown as consisting of two side plates, C, and connecting-stretchers D, and designed to be susceptible of being suspended in any suitable manner. To preclude the slip of the hoist-chain designed to be used with the wheel or pulley, the latter may be a sprocket-wheel, provided with peripherical projections or recesses for meshing into the chain. The sides of this hoist wheel or pulley are provided with teeth *a*, extending inwardly toward the axis. E designates two levers supported on a stretcher or fulcrum, D^1, between shoulders *b* thereon and the side plates, C, of the frame of the hoisting apparatus, said levers being slotted, so as to be free to move longitudinally. At the innermost end these levers are fitted to eccentrics F, rigidly secured in reverse positions to the shaft B. Between their fulcrum D^1 and the eccentrics F these levers are provided with teeth or a segmental toothed rack, *c*. As the shaft B, which constitutes the driving-shaft of the apparatus, is rotated by a crank, G, or a suitable pulley and tackle, the eccentrics F alternately rise, so that the racks *c* engage with the teeth *a* of the hoist wheel or pulley A, and by vibrating sidewise impart to the said wheel or pulley a rotary motion, serving to raise an article attached to the chain applied to the wheel.

A reverse motion of the shaft B serves to rotate the hoist wheel or pulley reversely, and lower an article which may be attached to the chain. The rack of one or the other of the levers E is always engaged with the teeth of the hoist wheel or pulley, and as the said wheel or pulley cannot impart motion to the levers, it is always locked against accidental motion, and the article to be hoisted may be suspended at any point.

Referring now to Figs. 3 and 4, A designates a hoist wheel or pulley mounted loosely on a shaft, B, supported in a frame or shell, C, represented as made in two pieces of metal, and provided with a device, D^3, for supporting it. This wheel or pulley is furnished with gear-teeth *a*, projecting outwardly from its periphery. E designates two levers, slotted to fit upon the shaft B, which, in this instance, forms their fulcrum, and fitted at their lower end to eccentrics F, secured rigidly in reverse positions to a driving-shaft, S, capable of being rotated by a crank, G, or a pulley and tackle. Between these eccentrics F and the shaft B the levers E are provided with gear-teeth or toothed racks *c*, which engage with the teeth *a* of the hoist wheel or pulley A.

The rotation of the shaft S causes the eccentrics F to alternately raise the levers E, so that their teeth or racks *c* will engage with and rotate the hoist wheel or pulley A, as described in connection with Figs. 1 and 2.

It will be seen that by my invention I provide a simple, cheap, and extremely powerful hoisting apparatus, wherein the hoist wheel or pulley is always locked against accidental operation.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of a hoist wheel or pulley provided with gear-teeth, levers provided with gear teeth or racks, and eccentrics for operating the said levers, substantially as and for the purpose specified.

2. The combination of a hoist wheel or pulley provided with gear-teeth, and supported loosely on the driving-shaft of the apparatus, levers provided with gear teeth or racks, and engaging with said hoist wheel or pulley, and eccentrics secured rigidly in reverse positions upon said driving-shaft, and operating said levers, substantially as and for the purpose specified.

3. The combination of the hoist wheel or pulley A, provided with teeth *a*, shaft B, frame C D, levers E, provided with teeth *c*, fulcrum D^1, eccentrics F, and crank G, substantially as and for the purpose specified.

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