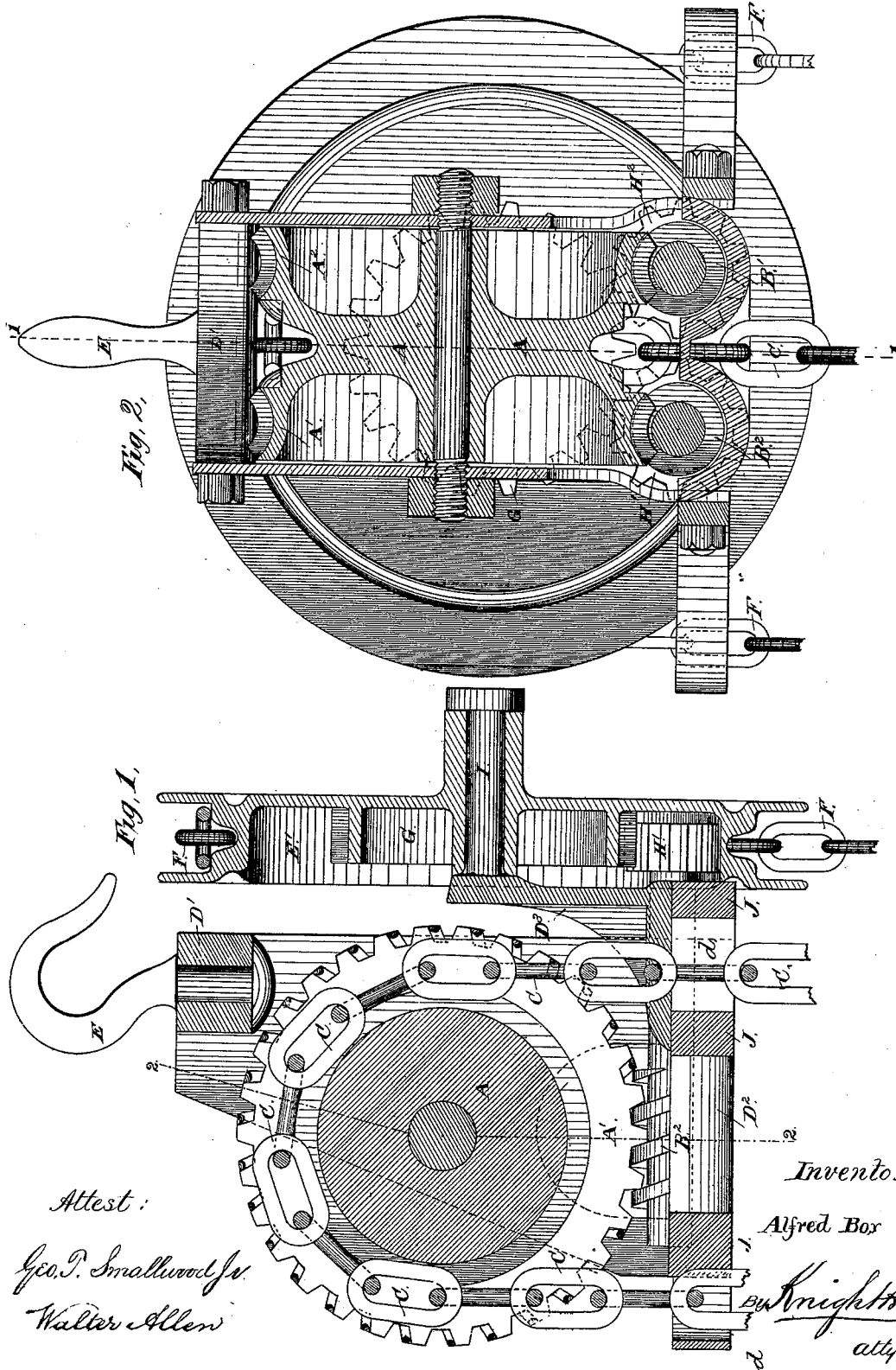


A. BOX.  
 Hoisting-Pulley and Worm-Gear Apparatus.  
 No. 218,223.      Patented Aug. 5, 1879.



Attest:  
 Geo. P. Smallwood Jr.  
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Inventor:  
 Alfred Box  
 By *Knights Bros.*  
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# UNITED STATES PATENT OFFICE.

ALFRED BOX, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN HOISTING-PULLEY AND WORM-GEAR APPARATUS.

Specification forming part of Letters Patent No. **218,223**, dated August 5, 1879; application filed December 11, 1878.

*To all whom it may concern:*

Be it known that I, ALFRED BOX, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Hoisting-Pulley and Worm-Gear Apparatus, of which the following is a specification.

My invention relates to my improved hoisting apparatus for which Letters Patent No. 199,955 were issued to me on the 5th day of February, 1878.

My improvement consists, first, in combining with the hand-chain wheel, which is constructed with a cog-wheel on its inner face, two screws, provided with pinions on their inner ends, and mounted side by side, so that both pinions may mesh with one side of the cog-wheel, which rotates nearly on a level with the hoisting-wheel and chain-sheave, while leaving sufficient room for the hoisting-chain to pass between said screws.

My improvement consists, secondly, in combining with my combined hoisting-wheel and chain-sheave, which is constructed with cogs on each side of the sheave portion, two screws geared directly with the cog-wheel on the inner face of the hand chain-wheel.

My improvement consists, thirdly, in mounting the operating-screws in open chilled bearings, formed in a frame constructed with openings for the hoisting-chain to pass through.

My improvement consists, fourthly, in providing said frame with a vertical arm carrying a stud on which the hand-chain wheel is mounted, thus locating the wheel nearly on a level with the hoisting-wheel and its periphery below the supporting-hook.

In order that my invention may be more fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a vertical section on the line 1 1, Fig. 2. Fig. 2 is a vertical section on the line 2 2, Fig. 1.

A represents my combined hoisting-wheel and chain-sheave, constructed with cogs A<sup>1</sup> A<sup>2</sup>, gearing with two screws, B<sup>1</sup> B<sup>2</sup>, running in chilled bearings J J, constructed in the frame D<sup>2</sup>.

C is the hoisting-chain, which may be connected with a hook or with a sheave below, in any customary manner.

The frame D, in which the hoisting-chain wheel runs, may be cast in one piece, or it

may be made with a separate piece, D', at top for the reception of the suspension-hook E. The latter is swiveled to the frame, and may, if preferred, be riveted directly into the solid frame.

E' represents the hand-chain wheel, and F the endless hand-chain passing over the same. The hand-chain wheel E' works on a stud, I, projecting from a vertical arm, D<sup>3</sup>, of the bottom plate D<sup>2</sup> of the frame, and carries a cog-wheel, G, on its inner face, (shown in dotted lines in Fig. 2,) gearing with the pinions H<sup>1</sup> H<sup>2</sup> on the screws B<sup>1</sup> B<sup>2</sup>. The frame D<sup>2</sup> has openings *d d* for the hoisting-chain to pass through.

The screws are simply laid in their bearings, and may be placed either at top or bottom of the wheel without material change in the construction. In fact this may be effected by a simple inversion of the machine, and changing the relative positions of the suspension-hook and the chains.

A great advantage is obtained by mounting the screws side by side, as it brings their pinions on one side of the cog-wheel and the hand-chain wheel on or about a level with the hoisting-wheel, thus rendering the machine compact.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The two screws B<sup>1</sup> B<sup>2</sup>, located on each side of the hoisting-chain, so as to permit it to pass between them, and constructed with pinions H<sup>1</sup> H<sup>2</sup> on their inner ends, in combination with the hand-chain wheel E', constructed with a cog-wheel, G, on its inner face, substantially as shown and described.

2. The two screws B<sup>1</sup> B<sup>2</sup> and pinions H<sup>1</sup> H<sup>2</sup>, in combination with the combined hoisting-wheel and chain-sheave A, having cogs A<sup>1</sup> A<sup>2</sup>, and combined hand-chain wheel E' and cog-wheel G, as and for the purpose set forth.

3. The frame D<sup>2</sup>, constructed with openings *d d* for the hoisting-chain, and the open bearings J J for the screws B<sup>1</sup> B<sup>2</sup> to turn in, substantially as shown and described.

4. The frame D<sup>2</sup>, constructed with a vertical arm, D<sup>3</sup>, and stud I, in combination with a hand-chain wheel, E', substantially as shown and described.

ALFRED BOX.

Witnesses:

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