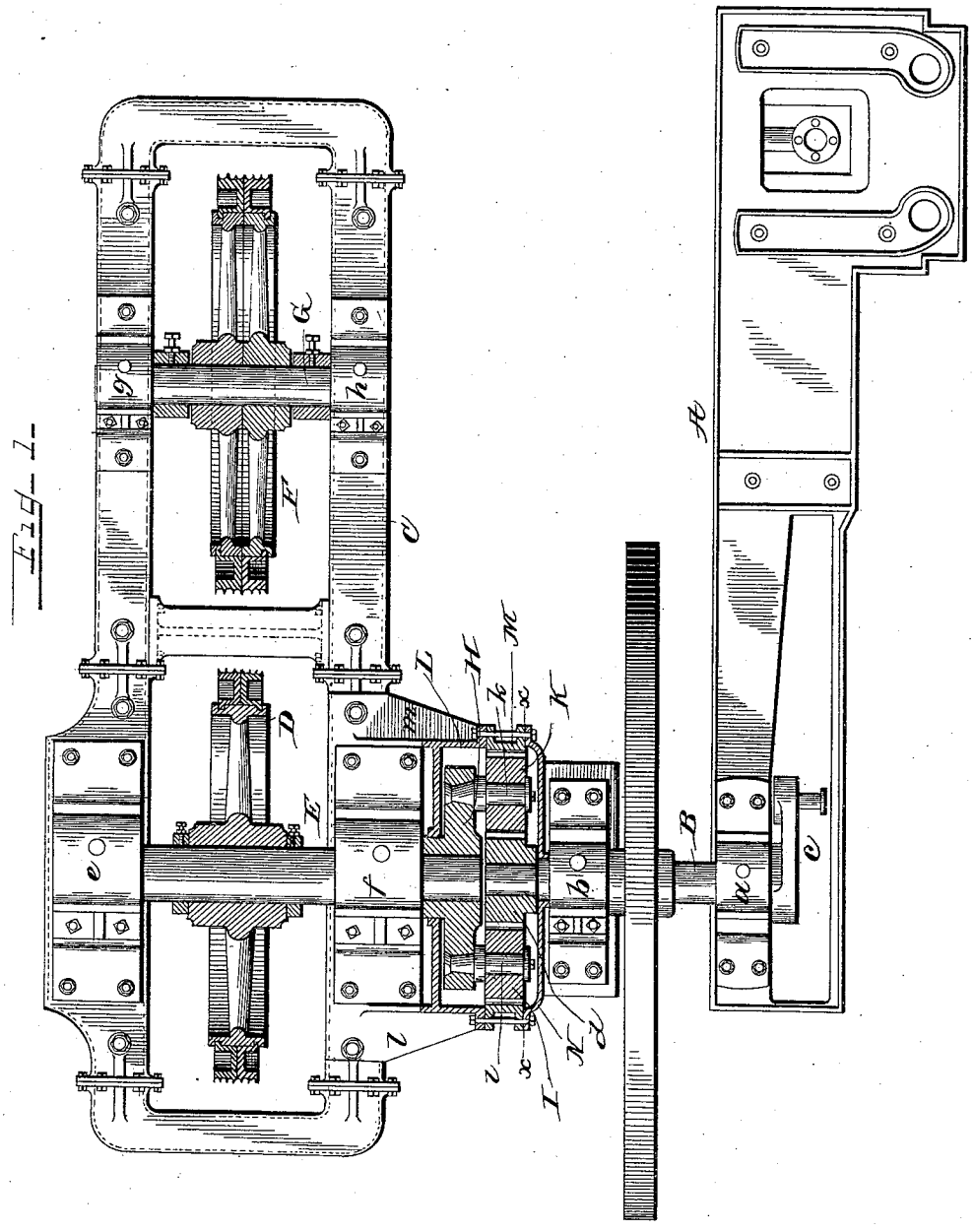
(No Model.)

2 Sheets—Sheet 1.

B. W. GRIST.

HOISTING MACHINERY.

No. 444,592. Patented Jan. 13, 1891.



Witnesses

G. A. Tauberschmidt.

C. D. Baker

Inventor

B. W. Grist

By his Attorneys

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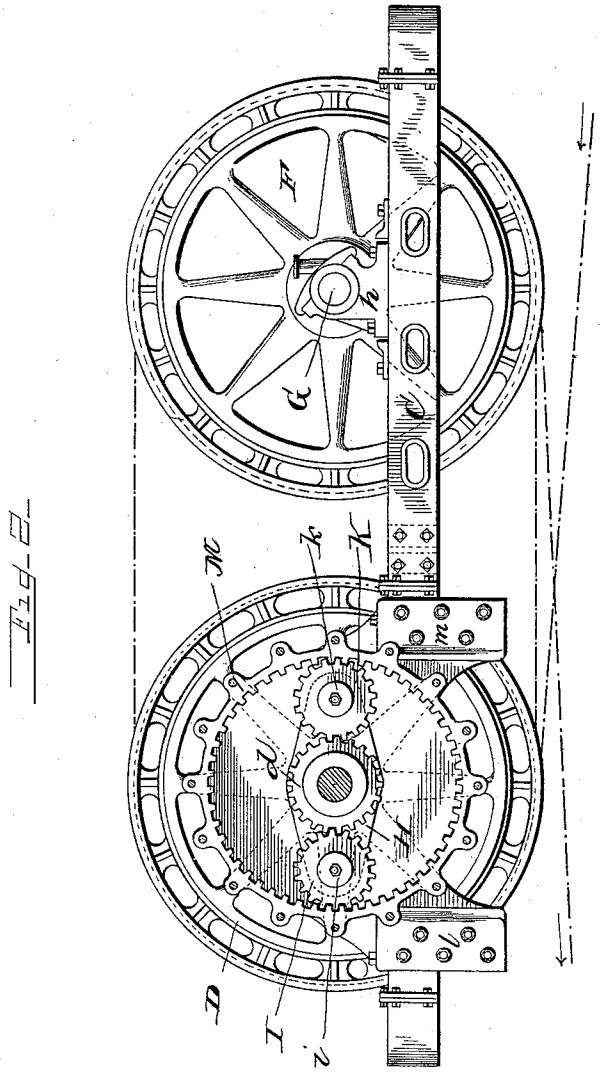
THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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UNITED STATES PATENT OFFICE.

BENJAMIN WEBSTER GRIST, OF PHILADELPHIA, PENNSYLVANIA.

HOISTING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 444,592, dated January 13, 1891.

Application filed October 9, 1890. Serial No. 367,471. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WEBSTER GRIST, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hoisting Machinery; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to hoisting machinery, and has for its object certain improvements in construction, which will be hereinafter described, and particularly pointed out in the claims.

In operating hoisting machinery the difference in speed of the driving and the driven shaft is usually effected by intermediate shafts and spur-gearing, which occupy considerable space.

It is the purpose of my invention to simplify the mechanism for effecting the differences of speed referred to and reduce the space occupied to a minimum.

In the accompanying drawings, which form part of this specification, Figure 1 represents a sectional plan of my invention, and Fig. 2 a vertical longitudinal section on the line *x x* and a side elevation of the frame and hoisting-drum.

Reference being had to the drawings and the letters thereon, A indicates a steam-engine frame, the engine being omitted, as it forms no part of my present invention; B, the engine or driving shaft, supported in suitable journal-bearings *a b*, the former being part of the engine-frame and the latter separate therefrom, and may be part of the hoisting-machinery frame. On one end of the shaft B is a crank *c*, with which the pitman (not shown) connects, and on the opposite end is secured a pinion *d*.

C indicates the frame of the hoisting machinery, upon which is supported the rope or cable driving drum D by its shaft E, resting in journal-bearings *e f*, and idler-drum F, supported upon a shaft G, resting in journal-bearings *g h*.

On one end of the driven shaft E is secured a head H, on which are two axles *i k*.

To one side of the frame C is secured a housing L by means of brackets *l m*, which rest upon and are attached to the frame by suitable bolts, and on the outer annular end of the housing is secured an annular internal gear-rack M, with which the pinions I K on the head H engage and transmit the power from the driving-shaft B to the driven shaft E and the winding-drum D at a greatly-reduced speed. The gearing is all inclosed by the housing L and the shield M on the outer end of the annular gear-rack M, thus protecting it from dust and preventing injury to persons employed about the machine.

The operation is as follows: The engine (not shown) imparts rotary motion to the driving-shaft B and pinion *d*. The latter, being in gear with the loose pinions I K, will cause them to revolve in an opposite direction to the pinion *d*, and the teeth of the pinions I K, being in contact with the fixed annular gear-rack M, causes the head H to revolve in the same direction as the engine or driving shaft B, but at a reduced rate of speed. The driving-head H being secured to the driven drum-shaft E, the rope or cable winding drum D will also revolve in the same direction as the engine-shaft but at the same reduced rate of speed as the driving-head H.

Having thus fully described my invention, what I claim is—

1. The combination of an engine-frame, a driving-shaft having a pinion secured thereon, a separate hoisting-frame, a shaft thereon supporting a drum and having a head supporting a loose or revoluble pinion, and a fixed annular gear-rack supported by the hoisting-frame.

2. The combination of an engine-frame, an engine-shaft having a pinion secured thereon, a separate hoisting-frame and a separate shaft supporting a drum and having a head attached to the end adjacent to the end of the engine-shaft having the pinion, loose or revoluble pinions attached to said head, and a fixed annular gear-rack secured to the frame of the hoisting-drum.

3. The combination of an engine-frame, an engine-shaft supporting a pinion at one end, a shaft supporting a drum and having pinions which engage with the pinion on the engine-

shaft, a hoisting-frame, a housing attached to the frame, and an annular gear-rack attached to said housing.

4. The combination of an engine-frame and a shaft having a pinion on one end, a separate hoisting-frame, a separate drum-shaft provided with a head and loose pinions at the end adjacent to the pinion end of the engine-shaft, a housing secured to the hoisting-frame, an annular gear-rack secured to the housing, and a shield attached to the outer edge of said rack.

5. The combination of an engine-frame and a separate hoisting-frame, arranged substantially as shown, an engine-shaft, a hoisting and an idler drum supported by the hoisting-frame, a detachable housing secured to one side and end of said hoisting-frame, an annular gear-rack secured to the housing, a pinion on one end of the engine-shaft, and a head on the drum-shaft supporting loose pinions.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN WEBSTER GRIST.

Witnesses:
JAMES E. GRIST,
GEO. SCHUHMANN.