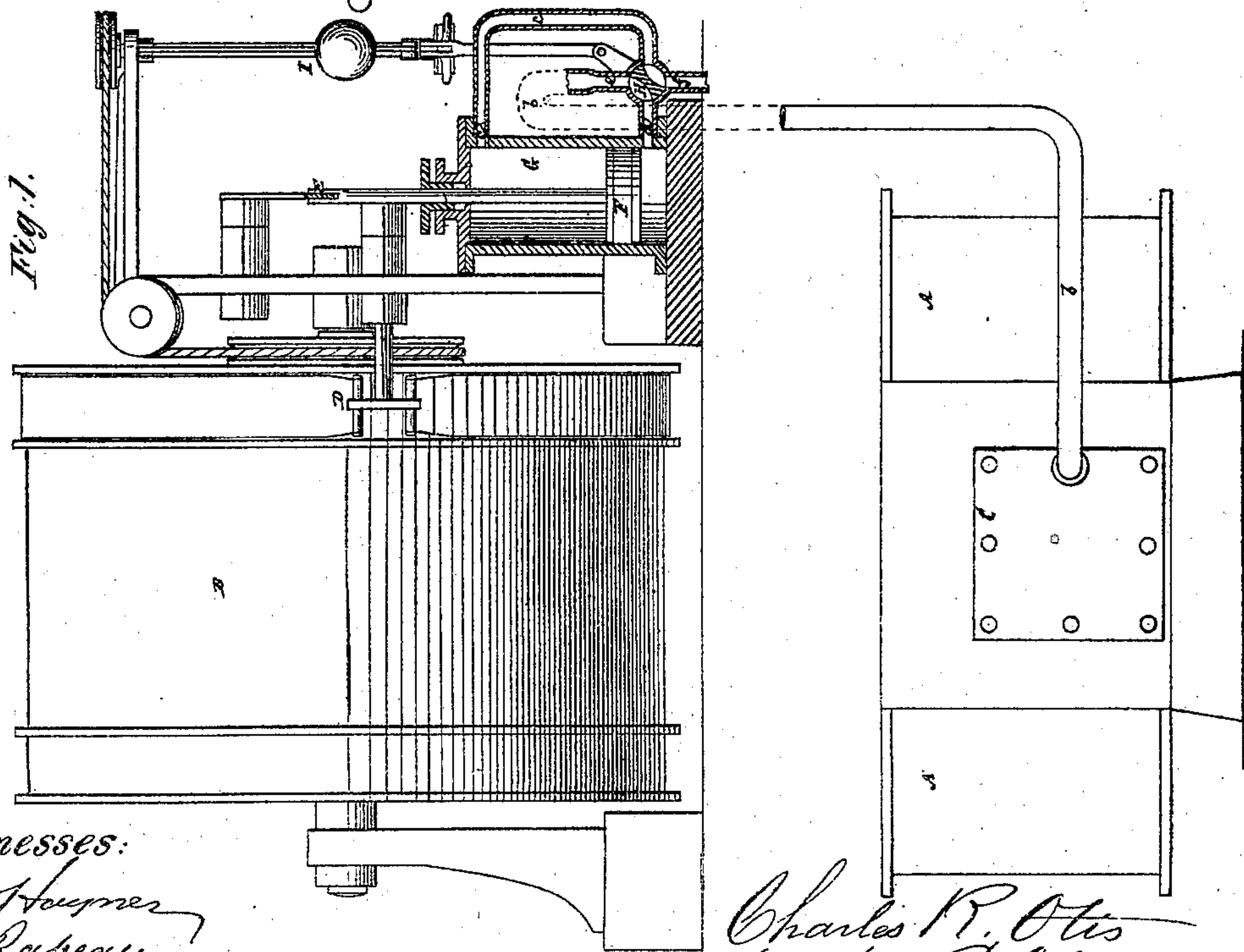
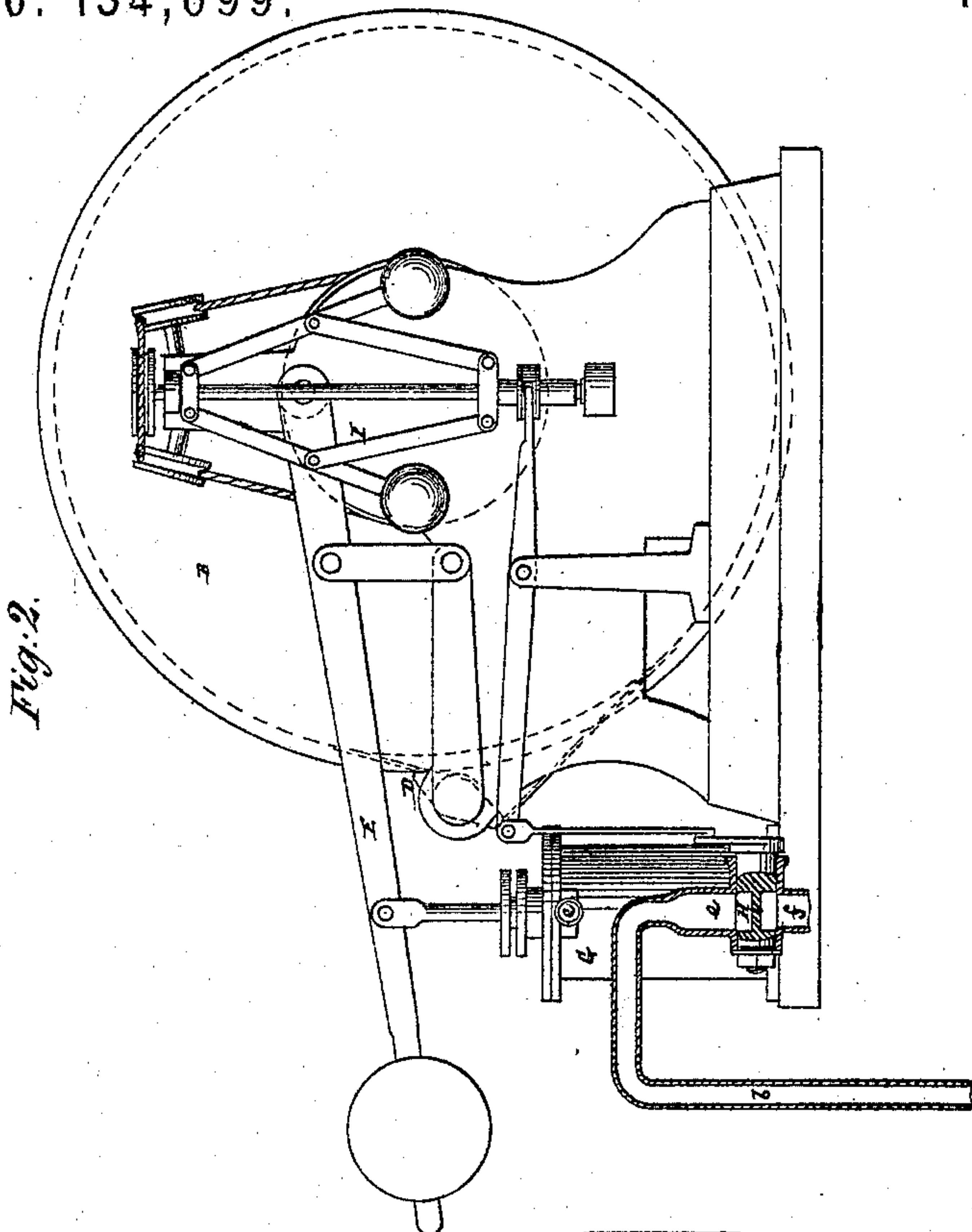


C. R. OTIS & N. P. OTIS.
Steam Hoisting Apparatus.

No. 134,699.

Patented Jan. 7, 1873.



Witnesses:
Thos. H. H. H.
R. R. R.

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UNITED STATES PATENT OFFICE.

CHARLES R. OTIS AND NORTON P. OTIS, OF YONKERS, NEW YORK.

IMPROVEMENT IN STEAM HOISTING APPARATUS.

Specification forming part of Letters Patent No. 134,699, dated January 7, 1873.

To all whom it may concern:

Be it known that we, CHARLES R. OTIS and NORTON P. OTIS, both of Yonkers, in the county of Westchester and State of New York, have invented certain Improvements in Steam Hoisting Apparatus, of which the following is a specification:

This invention consists in a combination, with a hoisting-drum and brake thereto, of a brake-operating steam-cylinder and a governor set in motion by the drum for controlling the admission of steam to the brake-operating cylinder. It also consists in a combination of the brake-operating steam-cylinder, the engine which drives the hoisting-drum, and a steam-pipe arranged so that the admission of steam to the valve-box of the engine also admits steam to the brake-operating cylinder to throw the brake out of action, so as to allow of the free rotation of the drum by the engine. The invention also consists in a certain combination of parts and devices whereby the actions, as recited in the two preceding clauses, are obtained in a very advantageous manner. By these improvements the hoisting-drum may be securely held at any desired point in the travel of the car attached to it, but is relieved when setting the engine in motion again in either direction; and in case of any undue velocity, arising from accident or breakage, the brake is applied to hold the drum.

In the accompanying drawing which forms part of this specification, Figure 1 represents a partly-sectional front elevation of a hoisting apparatus, in part, with our improvement applied to it; and Fig. 2 an end view of the same, in part.

Similar letters of reference indicate corresponding portions in both figures of the drawing.

A A represent the engine or engines for driving the hoisting-drum B, through the intervention of any suitable means. C is a steam-chest, containing the valve by which the engine is started and reversed. In free communication with said chest, outside of the reversing-valve, is a steam-pipe, *b*, that is supplied with steam from the chest whenever communication is opened between the boiler and the chest. D is the brake-strap or brake proper, applied to the drum and operated by

the raising and lowering of a weighted lever, E, which, when down, holds the brake on the drum. Connected with the lever E is a piston, F, arranged to reciprocate within a cylinder, G, which has connected with it a valve or cock, H, that serves to control passages *c*, *d*, *e*, and *f*. Two of these passages, *c* and *d*, form connections between the valve and the upper and lower ends of the cylinder G. The passage *e* connects with the steam-pipe *b*, and the passage *f* is an exhaust-way, open either to the atmosphere or to a condenser. The cock H is operated by a governor, I, which is set in motion by the hoisting-drum.

The operation is as follows: Prior to letting steam into the chest B the weighted lever E holds the brake D on the drum. As, however, steam is admitted to the chest B, and, before adjusting the reversing-valve to actuate the engine in the direction required, steam passes from the chest B by the pipe *b* down the passage *e*, through the valve, and along the passage *d*, thereby raising the piston F and relieving the brake, the passages *c* and *f* being then open to the exhaust. The engine being set going, the governor I is put in motion by the hoisting-drum; and so long as the latter does not exceed a proper velocity the valve H is not operated sufficiently to reverse its action, but, at most, to close the passages *e* and *f*. Should any accident occur, however, to make the drum run unduly fast, then the velocity of the governor actuates the valve H to open the passages *d* and *f* to the exhaust and the passages *e* and *c* to the steam, which then acts upon the piston F conjointly with the weighted lever E, to apply the brake and hold the drum.

We do not restrict ourselves, however, to any particular construction of valve for controlling the brake, and the various connections may be differently made without changing the characteristic features of the invention. Thus, it is not absolutely necessary that the brake should be moved in both directions by the steam, as the weighted lever may be sufficient, without the aid of steam, to apply the necessary force or friction to the drum, and the admission of steam to the brake-operating cylinder be restricted to the relieving of the brake, in which case the valve controlled by the governor would have to be arranged accordingly.

Also, instead of a piston within the brake-operating cylinder, a yielding or flexible diaphragm may be used.

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

1. The combination of a hoisting-drum, a friction-brake, a brake-operating steam-cylinder, and a governor set in motion by the drum, whereby the admission of steam to the brake-operating cylinder is automatically controlled by such governor.

2. The combination of the brake-operating steam-cylinder, the engine, and the pipe *b*, substantially as herein described, whereby the

admission of steam to the valve-box of the engine also admits steam to the brake-operating cylinder to throw the brake out of action.

3. The combination of the hoisting-drum B, the brake D with its weighted lever E, the engine A, the governor I, the valve H, the passages *c*, *d*, *e*, and *f*, the piston F, the cylinder G, the pipe *b*, and valve-chest C, essentially as and for the purpose herein set forth.

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Witnesses:

JAS. HENDERSON,
JOHN RAUCH.