

No. 756,821.

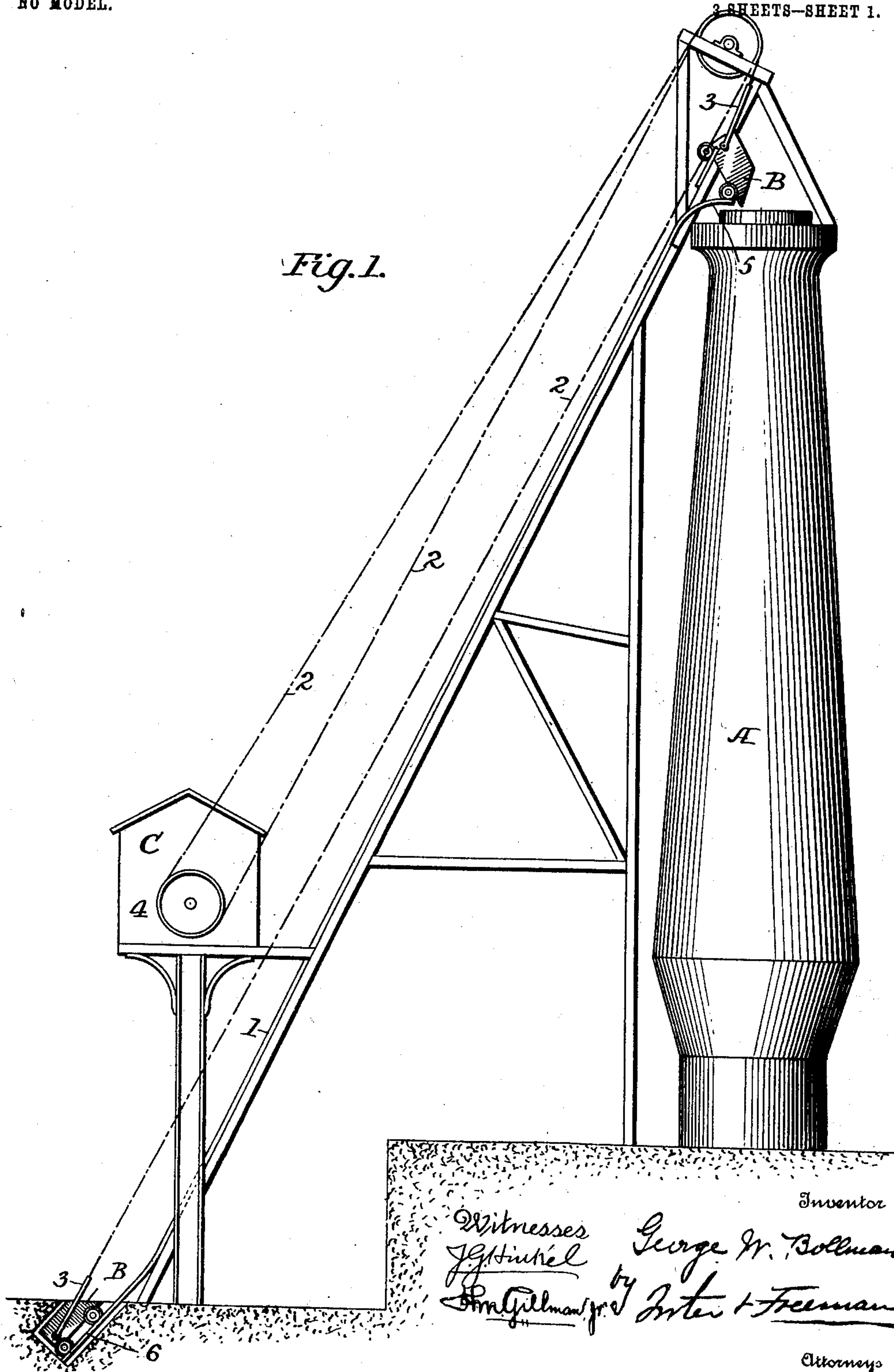
PATENTED APR. 12, 1904.

G. W. BOLLMAN.  
HOISTING EQUIPMENT.  
APPLICATION FILED FEB. 19, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

*Fig. 1.*



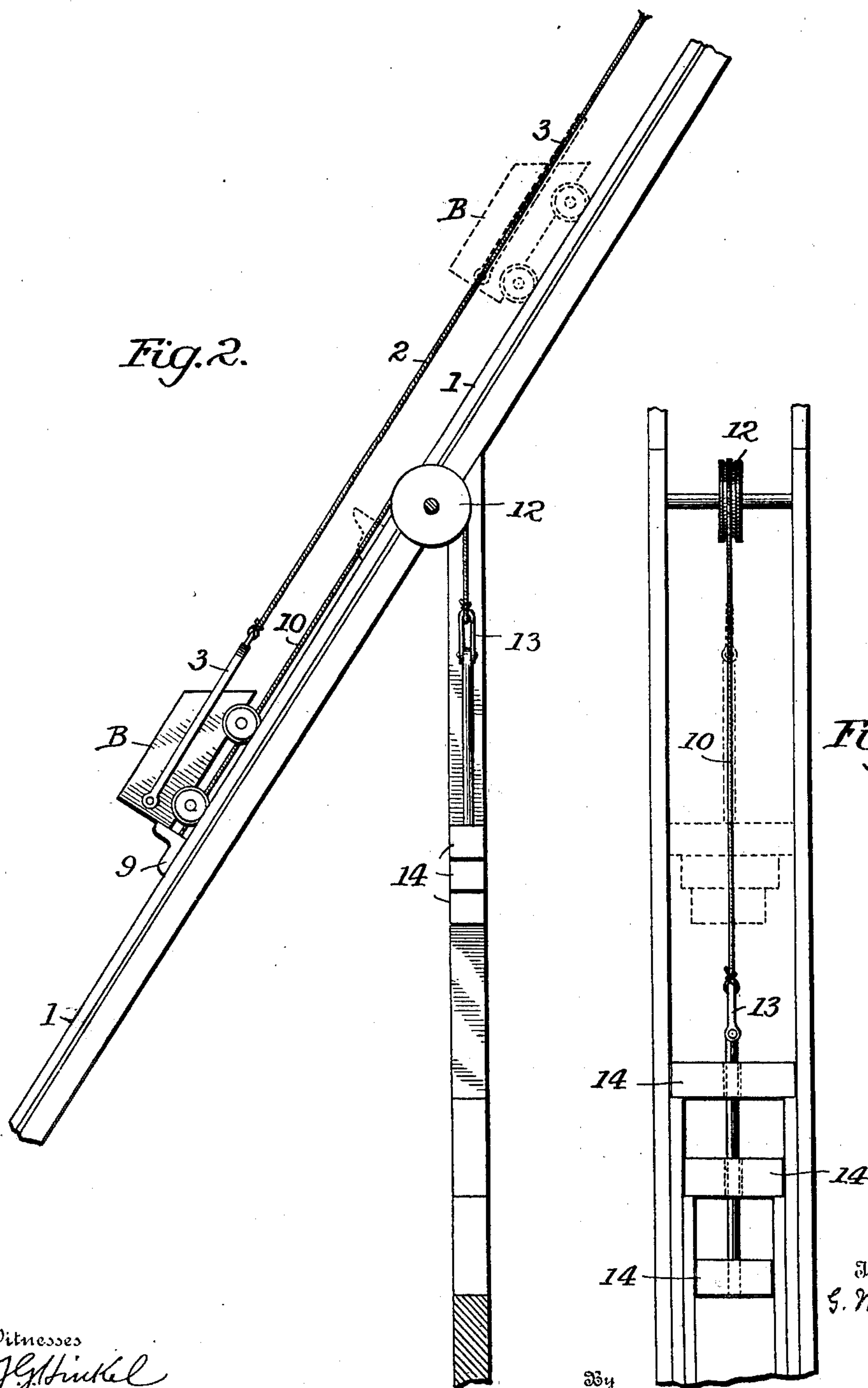
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3 SHEETS—SHEET 2.



Witnesses  
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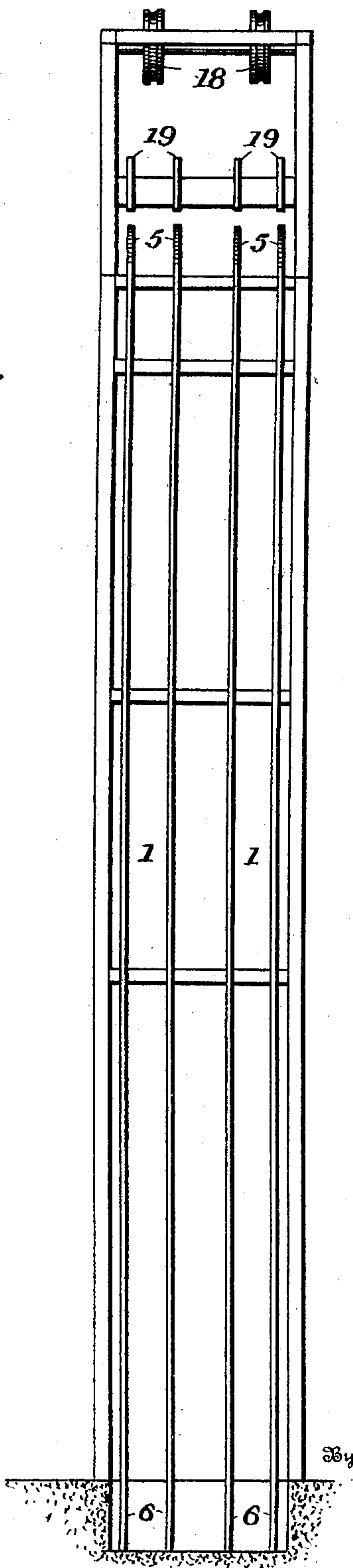
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NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

GEORGE W. BOLLMAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## HOISTING EQUIPMENT.

SPECIFICATION forming part of Letters Patent No. 756,821, dated April 12, 1904.

Application filed February 19, 1902. Serial No. 94,822. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. BOLLMAN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hoisting Equipments, of which the following is a specification.

My invention relates to that class of hoists generally employed for furnaces, in which two cars are flexibly connected, so that one will tend to counterbalance the other as they move up and down alternately on adjacent tracks; and my invention consists of means whereby when one car is carried toward the top of the furnace onto the branch or diverging track section with a reduced counterbalancing effect the draft of the other car will be reduced, as fully set forth hereinafter and as shown in the accompanying drawings, in which—

Figure 1 illustrates in elevation sufficient of a furnace-hoist to enable my invention to be understood. Fig. 2 is a side elevation of part of the hoist, illustrating a different means of reducing the draft of the lower car. Fig. 3 is a view illustrating the character of counterweight used in the construction shown in Fig. 2. Fig. 4 is a front elevation of the tracks.

When the invention is used in connection with a furnace A, there are main tracks 1 1, one for each of two cars B, provided with suitable wheels for running on said tracks, said main track being preferably inclined toward the top of the furnace, although it may be vertical. Each car is connected to one end of a lifting-cable 2, suitably arranged and driven so that the weight of one car will tend to counterbalance more or less that of the other. As shown, each cable is connected at one end to a yoke 3, pivoted to one of the cars near the rear thereof and at the other end to a winding drum of an engine, this drum 4 of a hoisting-engine C being suitably arranged and operated to drive the cable first in one direction and then in the other, the two cables being wound on the drum in reverse di-

rections and passing over guide-pulleys 18. At the end of the lift—that is, as shown, above the top of the furnace—is a track-section 5, which diverges at a lower grade from the main track toward the furnace, so that as the forward wheels of the car reach this section they will run thereon, while the rear of the car will be carried upward by the cable, and the car will thus be carried toward a horizontal position above the top of the furnace, and the contents may then be dumped either by opening a dumping-door or further lifting the rear end of the car, the rear wheels passing onto sections 19 of the main track, until the contents are discharged by gravity into the furnace. As the fore wheels of the upper car are thus carried over onto a lower-grade section its resistance to the lower car is reduced and tends to result in an undesirable increase in the speed of the travel of both upper and lower car just as the dump is about to occur, which causes heavy and sudden strain on the cables, cars, connections, and automatic controlling devices. To avoid these results, I provide means whereby the draft exerted by the lower car is reduced as the upper car passes onto a lower grade. This may be effected by different means. One means (shown in Fig. 1) is to carry the lower car onto a track-section 6 of the lower grade than the main track, the lifting or counterweighting effect of the lower car being thus reduced. As shown in Figs. 2 and 3, the lower car as it approaches the limit of its travel is made to lift a gradually-increasing weight. Thus the car engages a buffer-beam 9, guided to slide on the trackway and connected by a flexible connection 10, passing over a guide-pulley 12 to a yoke 13, which lifts the parts 14 successively of a sectional weight to afford an increasing resistance to the movement of the car.

In either construction it will be apparent the resistance of the lower car to its return or upward movement is reduced by means described, so that the reverse movement of the elevator is started with less strain than would otherwise be the case.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination with the double tracks  
5 of a lifting apparatus and with cars traveling thereon, of a cable connected to each car, means for driving the cable alternately in opposite directions, and upper and lower inclined track-sections, of lower grade diverg-  
10 ing from the main tracks, substantially as set forth.

2. The combination in a hoist, of the double main tracks, upper inclined sections diverging at lower grade laterally from the main

tracks, lower inclined sections diverging at  
15 lower grade in the opposite direction, cars running on the tracks and each connected near the rear with one end of a lifting-cable, and an engine driving the lifting-cable, substantially as set forth. 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE W. BOLLMAN.

Witnesses:

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H. O. CLARKE.