

(No Model.)

G. LAGERQUIST.  
ELEVATOR BRAKE.

No. 465,325.

Patented Dec. 15, 1891.

Fig. 1.

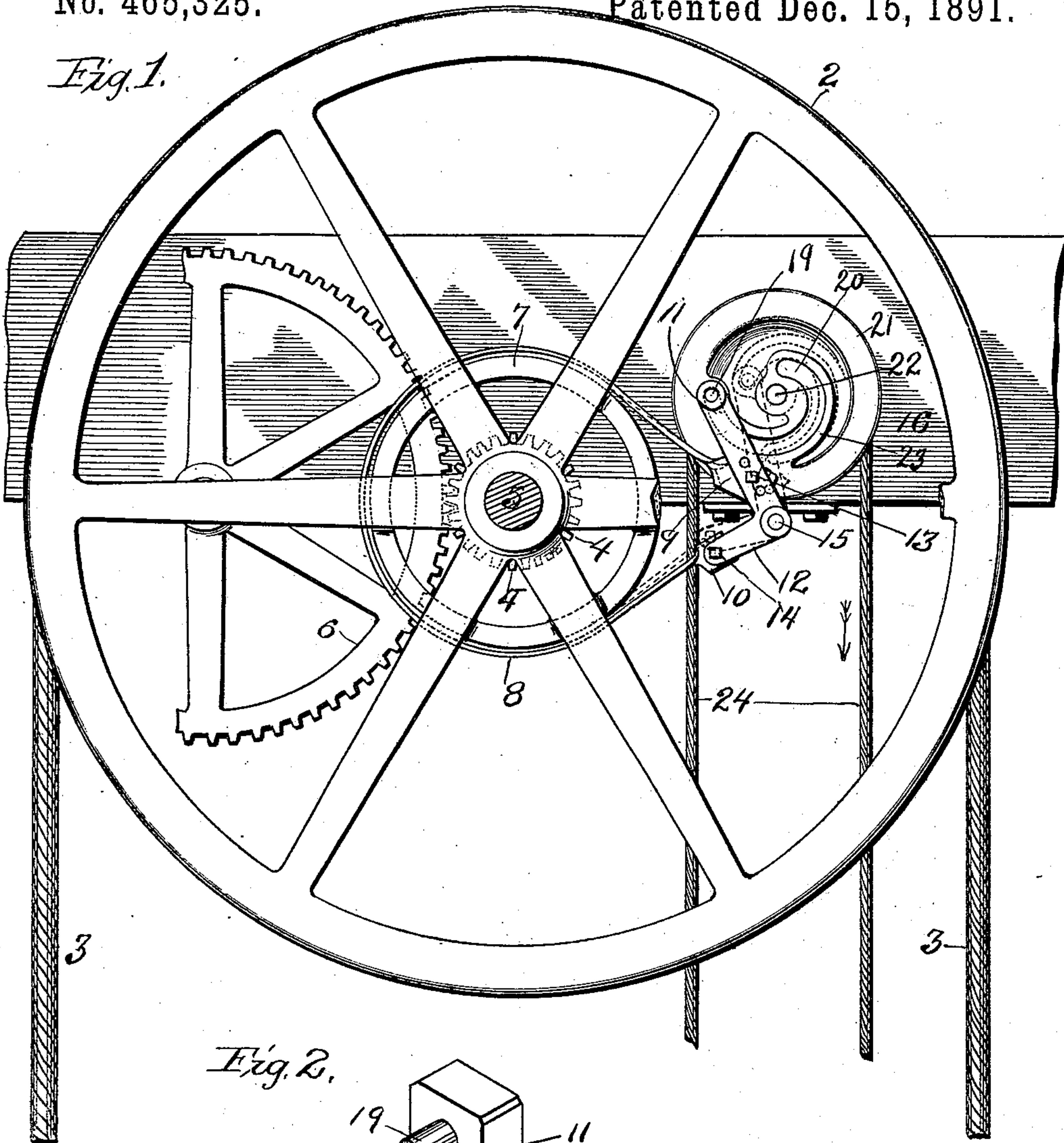
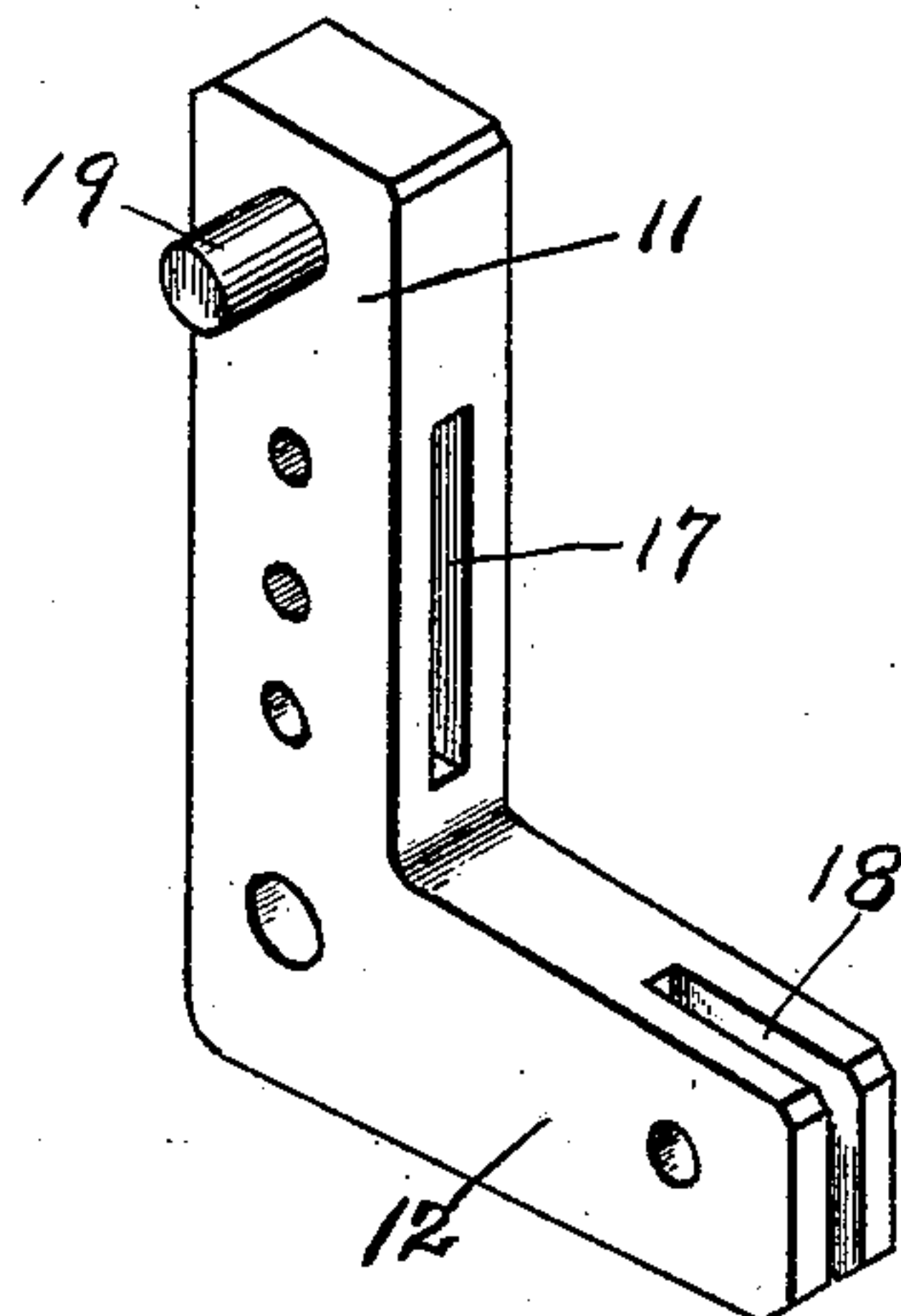


Fig. 2.



Witnesses.

C. E. Van Doren.

A. Hawley.

Inventor.

Gust Lagerquist.

By Paul Merwin Attys.



# UNITED STATES PATENT OFFICE.

GUST. LAGERQUIST, OF MINNEAPOLIS, MINNESOTA.

## ELEVATOR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 465,325, dated December 15, 1891.

Application filed May 1, 1891. Serial No. 391,224. (No model.)

*To all whom it may concern:*

Be it known that I, GUST. LAGERQUIST, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain  
5 Improvements in Elevator-Brakes, of which the following is a specification.

My invention relates to means for limiting the falling speed of an elevator-car and for stopping the car entirely; and the object I  
10 have in view is to provide a friction-brake and means for applying the same, which will be absolutely reliable and safe and at the same time of a construction simple and cheap to manufacture.

15 The invention consists in a friction-wheel provided in connection with the elevator hand cable-wheel, in combination with a friction clutch-strap, together with a bell-crank lever, to which the ends of the strap are at-  
20 tached, and a cam and brake-rope wheel adapted to operate the same to tighten or loosen said strap about said friction-wheel.

My invention consists, further, in various details of construction and in combinations  
25 hereinafter described, and particularly pointed out in the claims.

The construction of my newly-invented apparatus will be more readily understood by reference to the accompanying drawings, in  
30 which—

Figure 1 is a general vertical view of an elevator apparatus provided with a brake embodying my invention. Fig. 2 is an isometric view of the bell-crank lever employed in  
35 connection with the same device.

My apparatus is especially designed for use in connection with hand elevators. Such elevators are usually operated by a large loose cable or rope passing over a wheel of large  
40 diameter provided in the top of the shaft and operating elevator cable-drums through a system of reducing-gears. Such a wheel is represented by that numbered 2 in the drawings. The rope or cable 3 passes in a loop over and  
45 around this wheel, and through the same operates the pinion 4 on the shaft 5 of the wheel 2. The pinion 4 meshes with the large gear 6, which in turn gears with pinions (not shown) on the elevator-drums. A friction-wheel 7 of  
50 a size proportioned to the carrying capacity of the elevator is fixed on the wheel 2 or the shaft 5 thereof, and is provided with a flat

friction-surface adapted to receive the friction-strap 8. This strap 8 has its ends 9 and 10 secured in the arms 11 and 12 of the bell-  
55 crank lever. The ends 9 and 10 of this friction-strap are twisted at right angles to the rest of the strap, and are provided with one or more openings adapted to receive the bolts 13 and 14, passing through suitable openings  
60 in the arms 11 and 12 of the bell-crank lever. The bell-crank is pivoted upon the stationary shaft or stud 15, fixed upon the cross-beam 16, or other suitable support. The lower arm 11 of this bell-crank is about half the length of  
65 the upper arm 12; but the distances between the centers of the bolts 13 and 14 and the center of the stud are substantially the same. Slots 17 and 18 are provided in the arms to receive the ends 9 and 10 of the strap, the  
70 same being large enough to allow the ends free movement upon the bolts 13 and 14 as pivots. I may provide several bolt-holes in each arm for the accurate initial adjustment of the friction-strap. The upper end of the  
75 arm 11 is provided with a lateral pin or lug 19, adapted to project into the slot or spiral way 20 and to engage the walls formed in or upon the side of the brake-rope wheel 21. The  
80 brake-rope wheel is secured upon a short stationary shaft 22.

Considerable tension will obviously be exerted upon the walls of the cam-slot, and hence they should be strong, but need not occupy the full face of the wheel. I therefore  
85 form the walls 23 about as shown. The brake-rope 24 is preferably wound in a deep groove provided in the face of the brake-wheel, the rope being wound several times about the  
90 wheel to give sufficient grip thereon to prevent the rope from slipping.

It will be seen that when the rope is pulled down in the direction of the arrow the wheel 21 will be rotated to throw the lug 19 and the end of the arm 16 in toward the center  
95 of the brake-wheel shaft 22. This movement draws the strap 8 tightly about the periphery of the friction-wheel 7, thereby partially or wholly preventing the movement of the same and of the elevator-car. The farther the lug 19 is drawn in toward the center  
100 of the brake-rope wheel and the inner end of the cam-slot the tighter will be the grip of the friction-strap upon the wheel 9. On the



other hand, when the rope 24 is pulled in the opposite direction the bell-crank lever is thrown out toward the circumference of the brake-rope wheel, thereby loosening the strap  
 5 to any desired degree. The incline of the cam-slot is very gradual, and hence it will be seen that the leverage of the bell-crank thereon is much too small to cause the independent rotation of the brake-rope wheel.  
 10 The friction-wheel therefore, being stopped in any given position, will remain stationary until again free by the operation of the rope 25 to loosen the strap on the same.

My brake apparatus is especially useful  
 15 when used in connection with elevators employed in lowering heavy weights.

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

20 1. The combination, with the shaft 5 and wheel 2, of the friction-wheel provided in connection therewith, a friction-strap 8, a bell-crank lever engaging the ends thereof, a cam-wheel provided in connection with a  
 25 brake-rope wheel and having a cam-slot, a lug or pin upon the said bell-crank lever adapted to enter said slot, and a brake-rope passing over said brake-rope wheel, whereby the tension or grip of said strap upon the said fric-

tion-wheel may be accurately adjusted, substantially as described. 30

2. The combination of the wheel or pulley 2 and the shaft 5 thereof, with the friction-wheel 7 secured thereon, the strap 8, the bell-crank lever having arms 11 and 12 and piv- 35  
 40 oted on a stationary stud 15, the ends of said strap secured in the arms of said lever, a cam-wheel having a cam-slot, means for operating the same, and a pin or lug on said arm 11, adapted to enter said slot, substantially as  
 45 and for the purpose specified.

3. The combination, with the wheel 2, of the friction-wheel secured thereon, the strap 8, having ends 9 and 10, the bell-crank lever having arms 11 and 12, in which said ends 45  
 50 are secured, the cam and brake-rope wheel 21, provided with the cam-slot 20, means whereby said wheel 21 is adapted to be revolved, and a pin or lug 19, provided on the end of the arm 11 and projecting into said slot 20, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 28th day of April, 1891.

GUST. LAGERQUIST.

In presence of—

C. G. HAWLEY,  
 FRED S. LYON.