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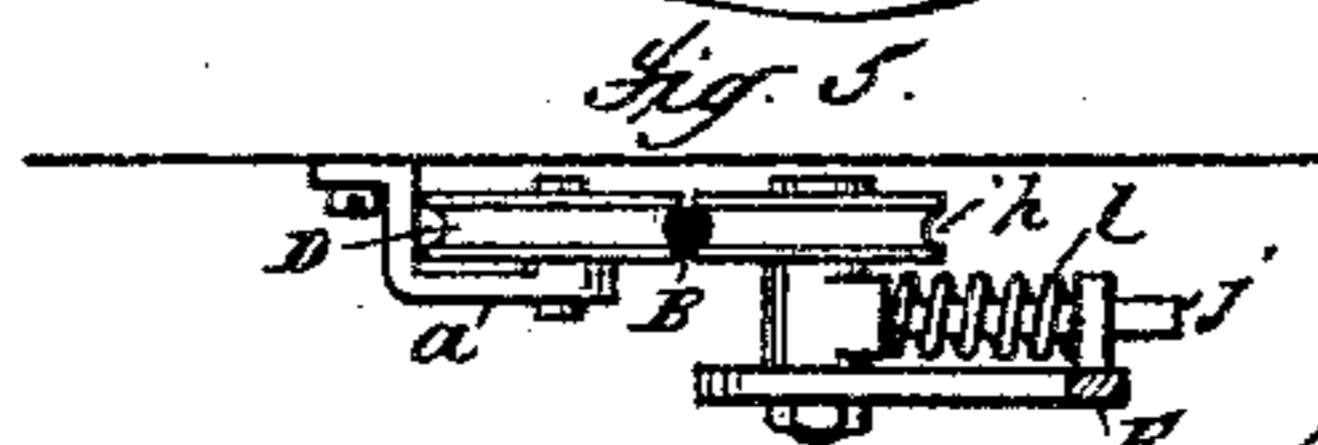
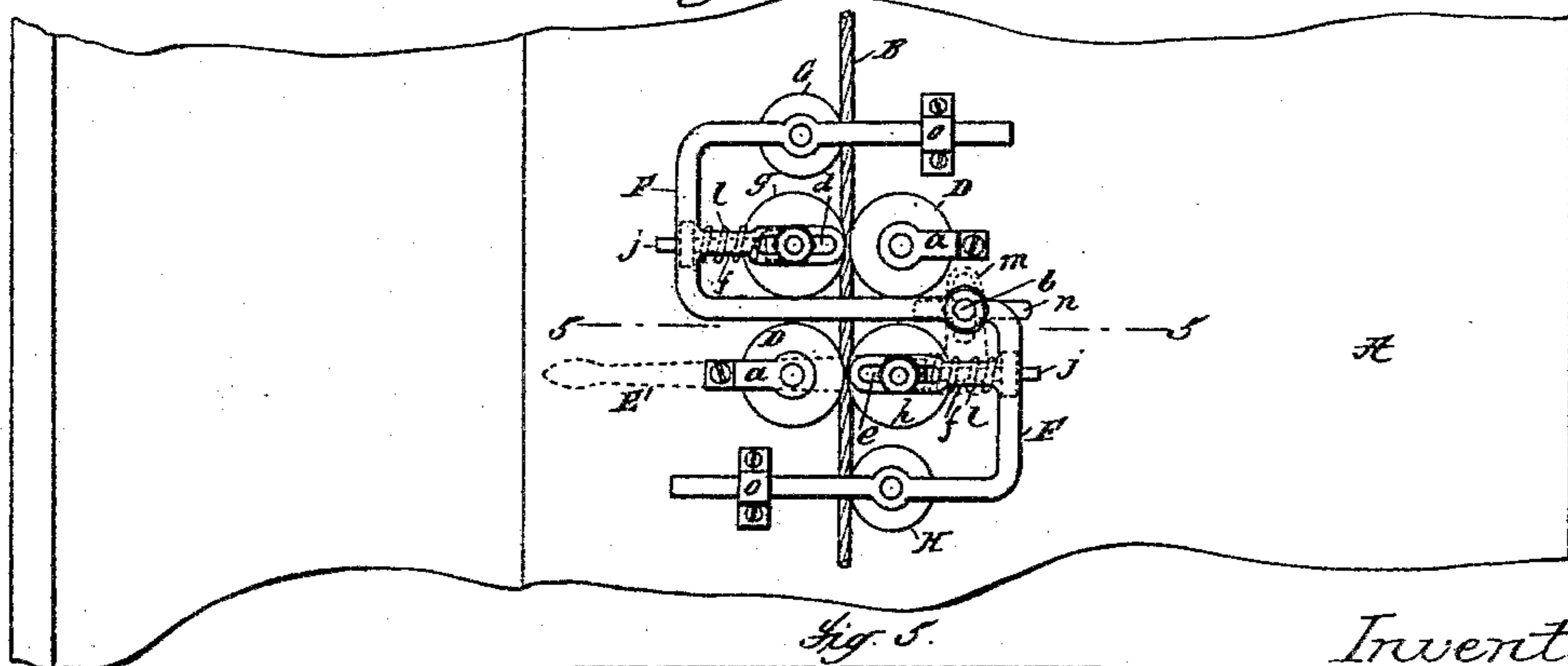
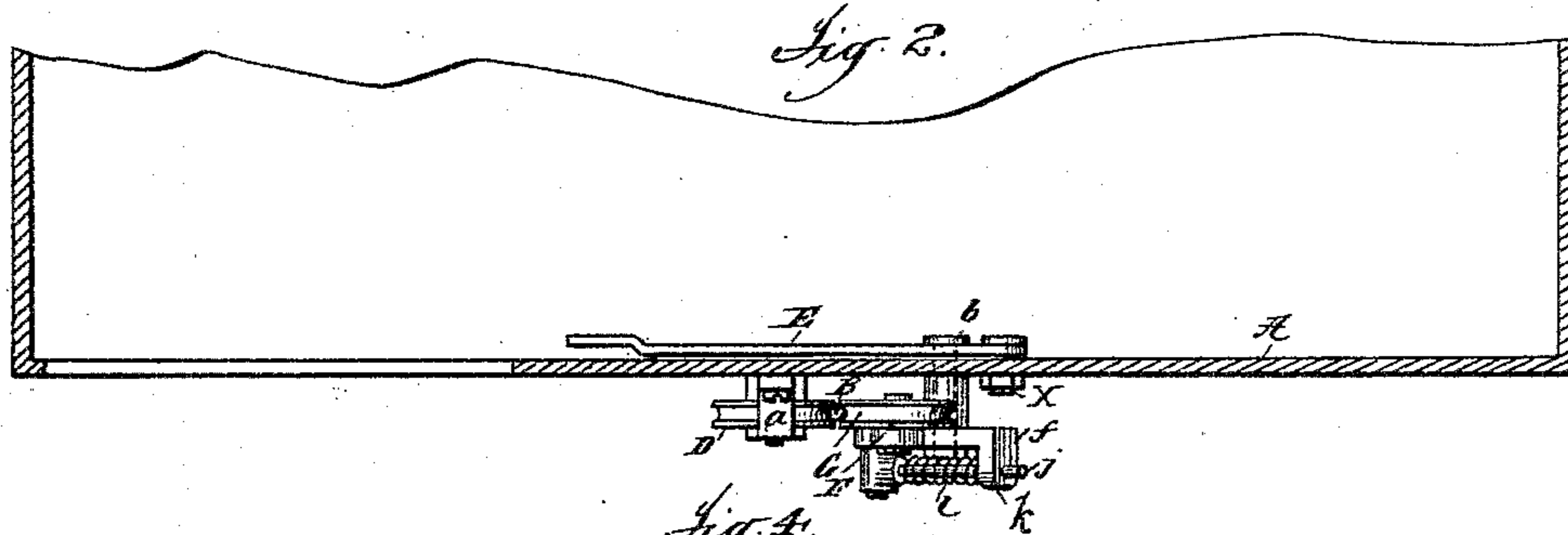
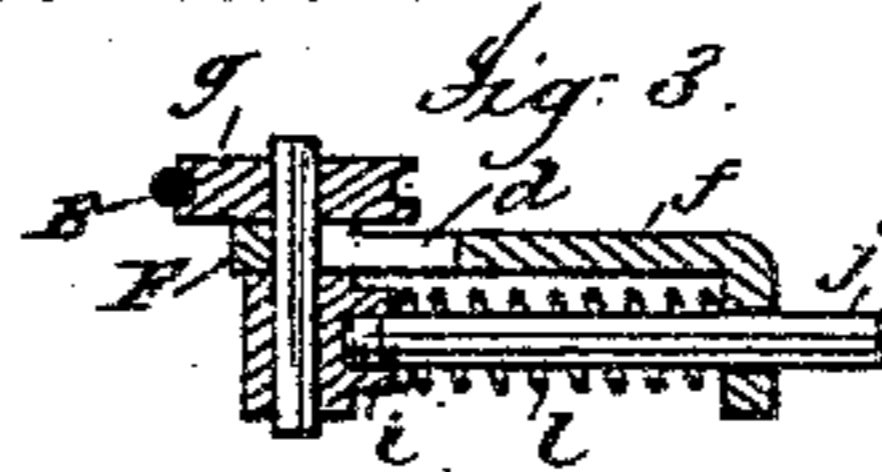
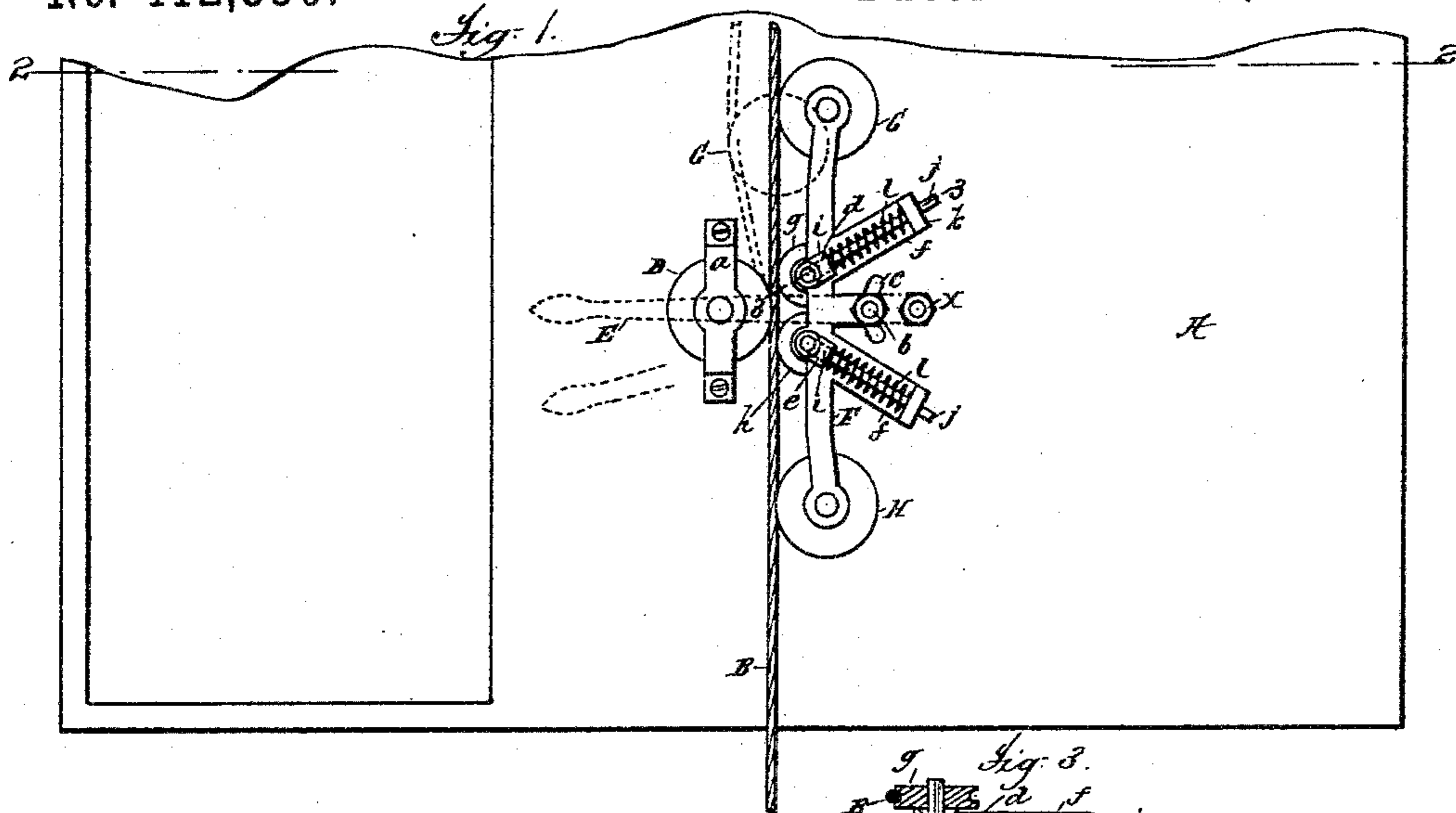
2 Sheets—Sheet 1.

W. P. GIBSON.

VALVE OPERATING DEVICE FOR ELEVATORS.

No. 412,330.

Patented Oct. 8, 1889.



Attest:  
Chas. H. Botts.  
J. Kennedy

Inventor:  
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Attys

(No Model.)

2 Sheets—Sheet 2.

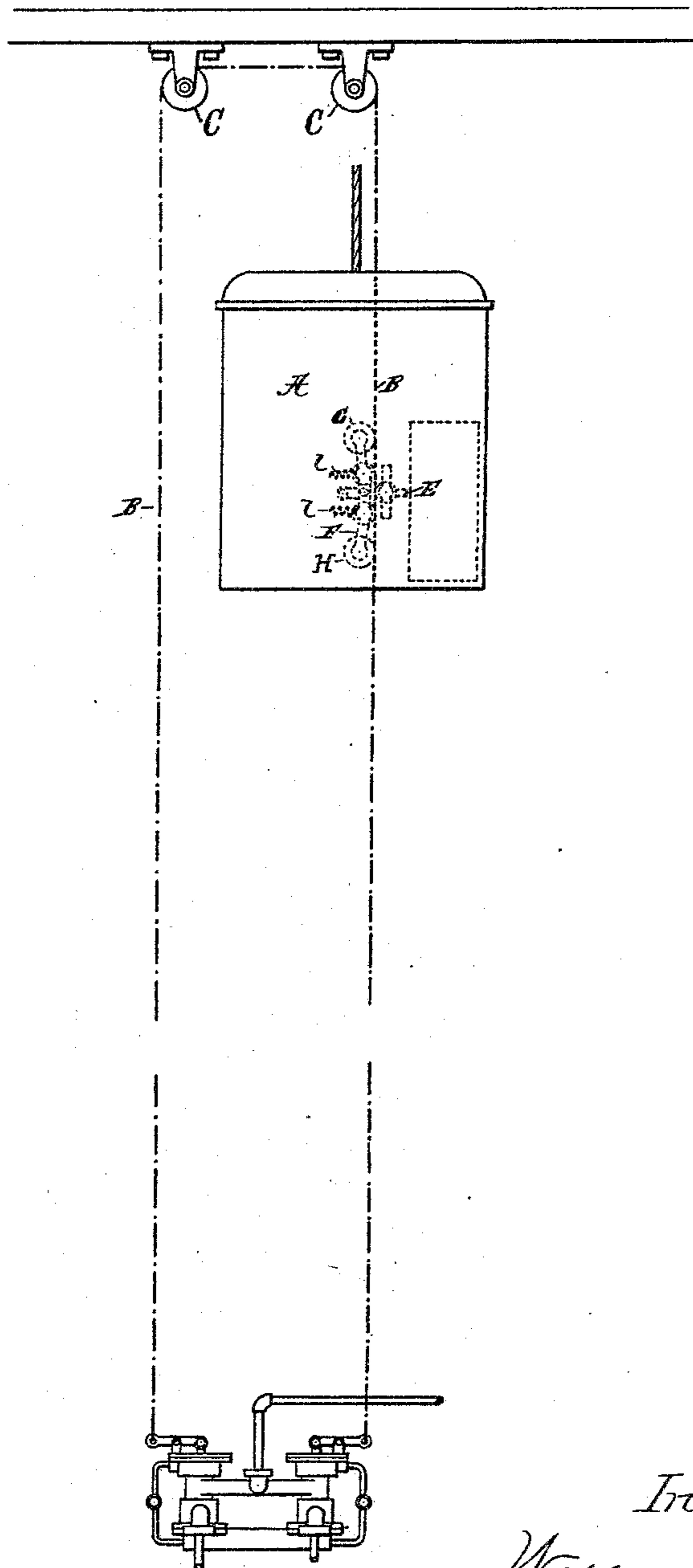
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*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

WILLIAM P. GIBSON, OF NEW YORK, N. Y.

## VALVE-OPERATING DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 412,330, dated October 8, 1889.

Application filed December 31, 1888. Serial No. 294,999. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. GIBSON, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Valve-Operating Devices for Elevators, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in devices for operating the valve or other stopping and starting mechanism of an elevator from the elevator-car.

The present invention consists of a peculiar construction and arrangement of what is commonly known as a "deflecting" device, the movement of which in one direction causes a downward strain to be exerted upon a rope connected to operate said valve or other mechanism, and the movement of which in the opposite direction causes an upward strain upon the rope, the device in its normal position being so arranged as to travel with the car out of contact with the rope.

The invention also consists of a modification in the construction of this deflecting device, which will be hereinafter fully described.

In the accompanying drawings, Figure 1 is a front view of an elevator-car provided with my improved deflecting device. Fig. 2 is a horizontal section of the same on the line 2 of Fig. 1. Fig. 3 is a section on the line 3 of the same figure. Fig. 4 is a view similar to Fig. 1, illustrating a modification which will be hereinafter described. Fig. 5 is a section on the line 5 of Fig. 4, and Fig. 6 is a diagrammatic view illustrating the connections between the elevator-car and the valve mechanism of the elevator.

In said drawings it will be understood that A represents the elevator-car, and B the rope passing over sheaves C at the top of the elevator-shaft and connected to operate the main valve in the usual manner, as shown in Fig. 6. As shown in the present case, the rope B is connected to operate the two primary valves of an auxiliary valve mechanism, such as shown in my companion application, filed December 31, 1888, Serial No. 294,995; but it is to be understood that the invention is not limited in its application to a valve mechanism of this character, but may

be used in connection with any form of stopping and starting mechanism which can be controlled by a rope from the car. The rope B is located outside the car A, and the car A has secured to its front portion, upon the outer side thereof, a plate *a*, in which is journaled the shaft of a pulley D, the periphery of which moves freely along the rope D without deflecting it. The front wall of the car has also fulcrumed to it at *x*, on its inner side, a lever E, carrying a pin *b*, working in a slot *c* in the wall of the car, and upon the outer side of said wall secured rigidly to a frame F. The frame F carries at its upper and lower ends deflecting-pulleys G H, respectively, in contact with the rope B. The frame F also carries a pair of smaller pulleys *g h*, arranged opposite the pulley D, the shafts of which smaller pulleys enter and work in slots *d e*, respectively, formed in said frame. The shaft of each of the pulleys *g h* is journaled in a head *i*, formed upon a rod *j*, one end of which passes through an opening in a projection *k*, formed upon an arm *f*, projecting outward from the frame F. The pulleys *g h* are held normally in the outer end of their slots and in contact with the rope B by means of springs *l*, secured between the heads *i* and the projections *k* of the arms *f*. (See Fig. 1.)

The operation of the apparatus described is as follows: To cause the ascent of the car, the conductor will rock the lever E downward into the position shown by dotted lines in Fig. 1, thereby tilting the upper end of the frame F toward the rope B and its lower end outward therefrom. When the frame has been thus moved, the pulley *h* will be drawn out of contact with the rope B, the pulley *g* remaining in contact with said rope. The deflecting-pulley G, moving with the frame pressing against the rope B, will deflect it out of its perpendicular position into the position shown by dotted lines in Fig. 1, said rope at the same time being lightly clamped between the pulley *g* and pulley D. The rope B will be clamped between the pulleys *g* and D with sufficient pressure to prevent the deflection of the rope by the pulley G from drawing upward the part of the rope below the pulleys D *g*, and consequently said deflection will exert a downward pull sufficient to operate the valve-operating connections to

move the main valve to position to cause the downward movement of the power-piston and the raising of the car. When this movement of the car has been secured, the conductor will rock the lever E to its horizontal position, the deflecting-pulleys G H and the pulleys *g h* then returning to their normal position. To arrest the ascent of the car, the conductor will rock the lever E upward, thus moving the deflecting-pulley G out of contact with the rope B and forcing the deflecting-pulley H inward to deflect the rope B below the pulley D and cause the pulley *h* to clamp the rope lightly against the pulley D. The deflection of the rope at this point will draw it upward, and thus cause it to return the main valve to the position from which it was moved in starting. When the car has thus been arrested, the conductor will restore the lever E to its horizontal position. To cause the car to ascend, the conductor will again rock the lever E upward, thereby raising the rope and causing the proper movement of the power-piston; and so the operation will continue the tilting of the frame F by means of the lever E to cause the deflection of the rope B by the deflecting-pulley G or H, also causing the pulley *g* or *h*, as the case may be, to press the rope with a limited amount of force against the pulley D upon the portion of the periphery thereof next the deflected portion of the rope, the other pulley *g* or *h* being thrown out of contact with the rope.

In the organization illustrated in Figs. 4 and 5 the lever E is fulcrumed, as in the previously-described organization, and is of bell-crank form, and at its vertical portion is provided with a slot *m*, in which works a pin *b*, passing through and working in a horizontal slot *n* in the wall of the elevator-car, and secured to the frame F, which is in this case of S shape. The ends of the frame pass through guide-plates *o* upon the wall of the car, guiding the movement laterally of said frame. The frame F carries deflecting-pulleys G H, corresponding to the deflecting-pulleys of the former construction. Said frame is also provided upon opposite sides of the rope B with projecting arms *f*, like the arms *f* of said former construction, and like said arms provided with slots *d e*, in which are journaled the shafts of pulleys *g h*, respectively, held in contact with the rope B upon opposite sides thereof by springs *l*. Each of said pulleys *g h* has opposed to it, upon opposite sides of the rope B, a pulley D, corresponding to

the pulley D of the former construction, journaled in a plate *a*, secured to the wall of the elevator-car.

In the operation of the apparatus when thus constructed, to cause the car to ascend, the conductor will rock the lever E upward. The lever, when thus rocked, will move the pin *b* in the horizontal slot and through it move the frame F laterally from left to right, said frame being guided in a lateral path of movement by the guide-plates *o*, as before remarked. This movement of the frame F will take the deflecting-pulley H and the pulley *h* out of contact with the rope B and cause the deflecting-pulley G to deflect the rope above the pulley D, at the same time, by compressing the spring *l* of the pulley *g*, causing said pulley to press the rope B against the pulley D, with the effect before explained. The lever E will then be restored to its horizontal position. To arrest the car in its ascent, the lever E will be rocked downward, when the frame F will travel laterally in an opposite direction, causing the proper deflection of the rope B by the deflecting-pulley H below the lower pulley D. To cause the car to descend, the lever E will be moved back to its horizontal position and then again rocked downward, when the operation will be repeated.

What I claim is—

1. The combination, with a rope B, connected to operate the stopping and starting mechanism of the elevator, of gripping-pulleys arranged to grip the rope with a moderate pressure and a movable deflecting-pulley for deflecting the rope upon one side of said gripping-pulleys, substantially as described.

2. The combination, with a rope moving freely over a pulley at the top of the elevator-shaft and having its ends connected to operate the stopping and starting mechanism to cause the car to ascend and descend as the rope is moved in opposite directions, of gripping-pulleys arranged to grip the rope with a moderate pressure and movable deflecting-pulleys located above and below said gripping-pulleys and arranged to deflect the rope upon opposite sides of said gripping-pulleys, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WM. P. GIBSON.

Witnesses:

J. J. KENNEDY,  
EDWARD WOOD.