

(No Model.)

2 Sheets—Sheet 1.

S. E. STOKES.

ELEVATOR.

No. 384,096.

Patented June 5, 1888.

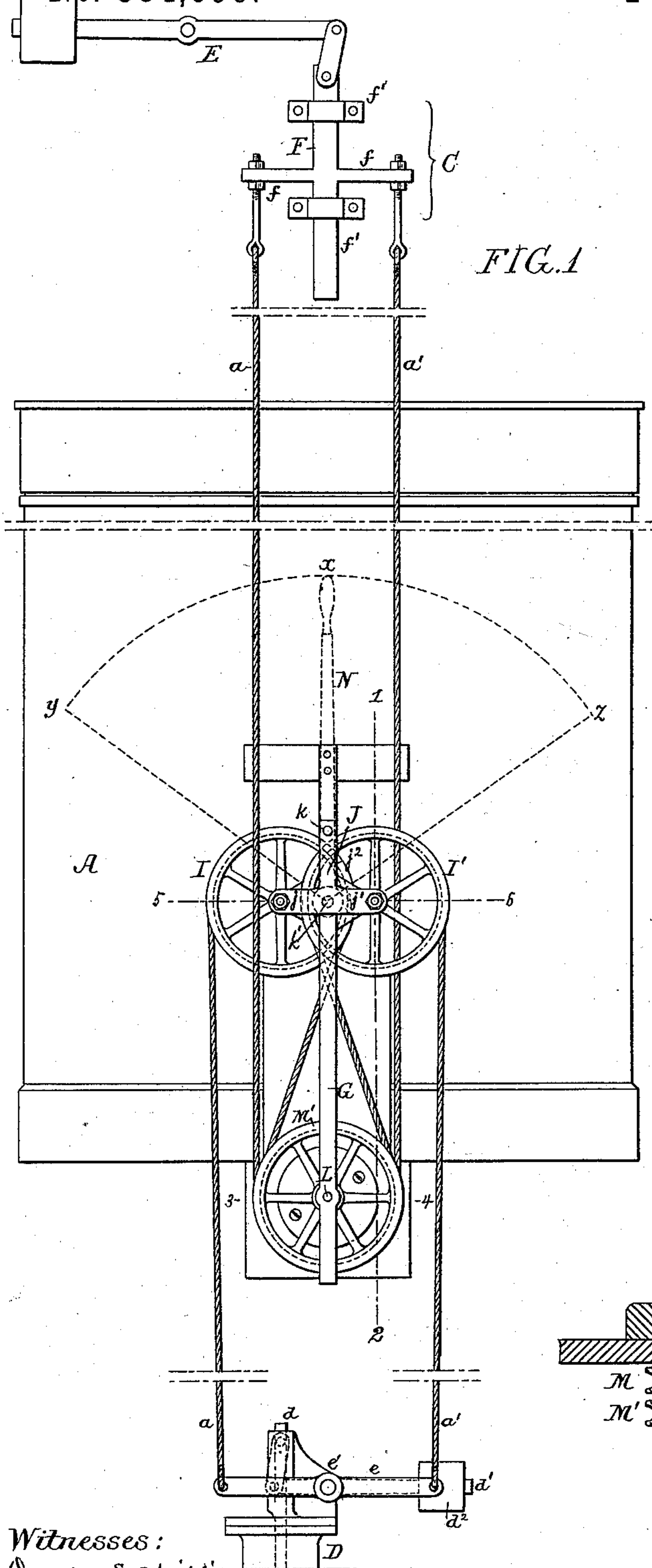


FIG. 1

FIG. 2

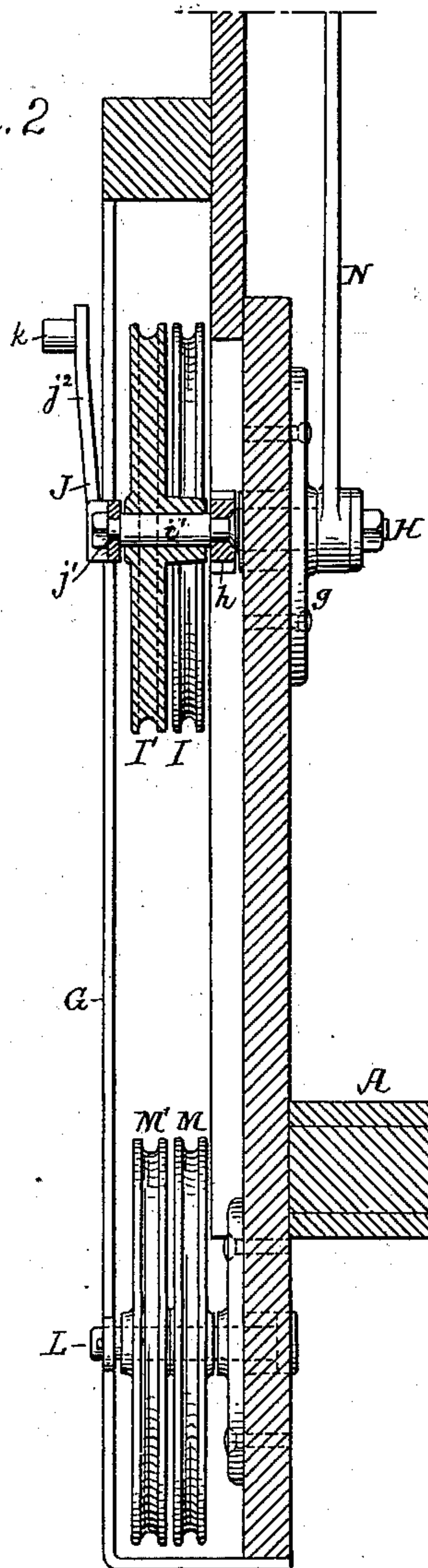
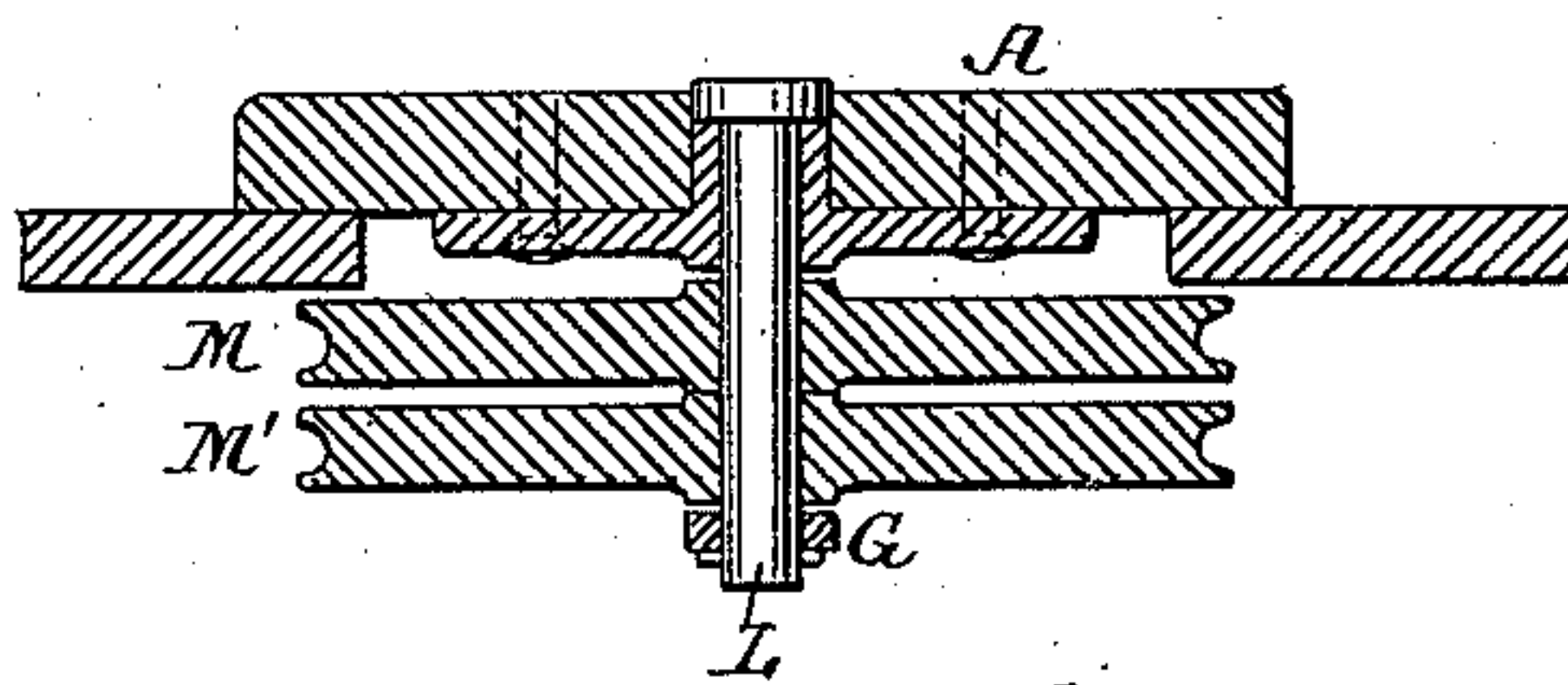


FIG. 3



Witnesses:

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Alex. Barkoff

Inventor:  
Samuel E. Stokes.  
by his Attorneys.

Howson & Howson.

(No Model.)

2 Sheets—Sheet 2.

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FIG. 4.

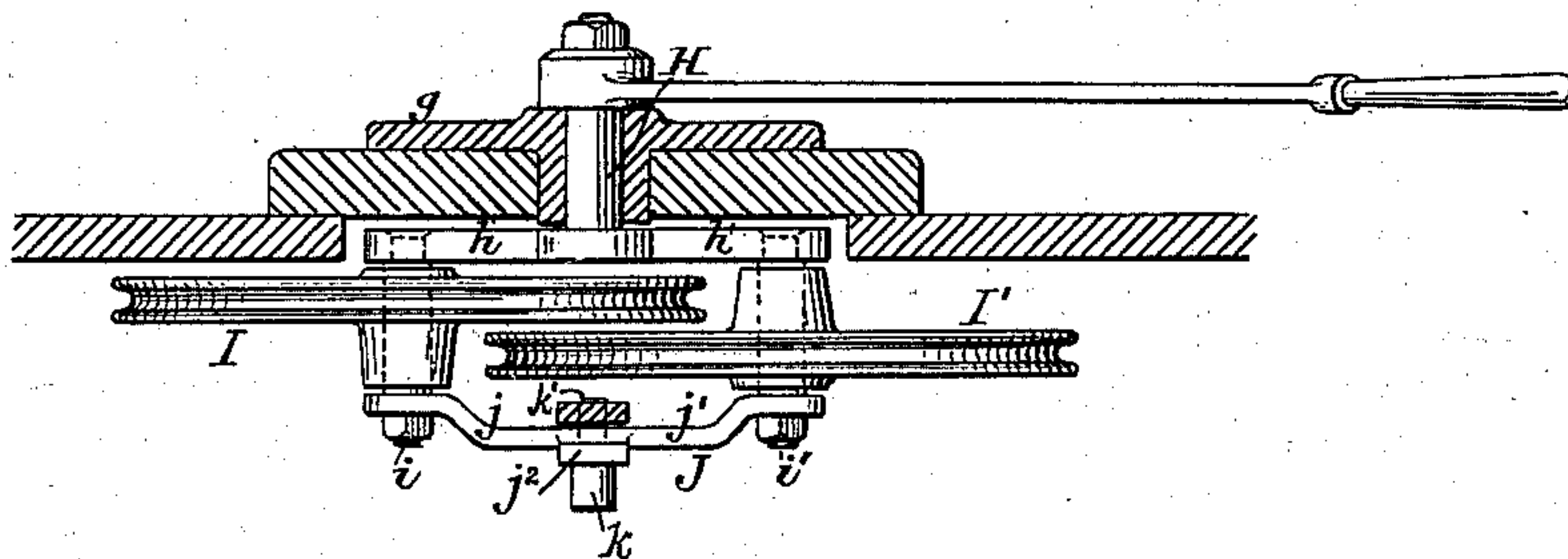
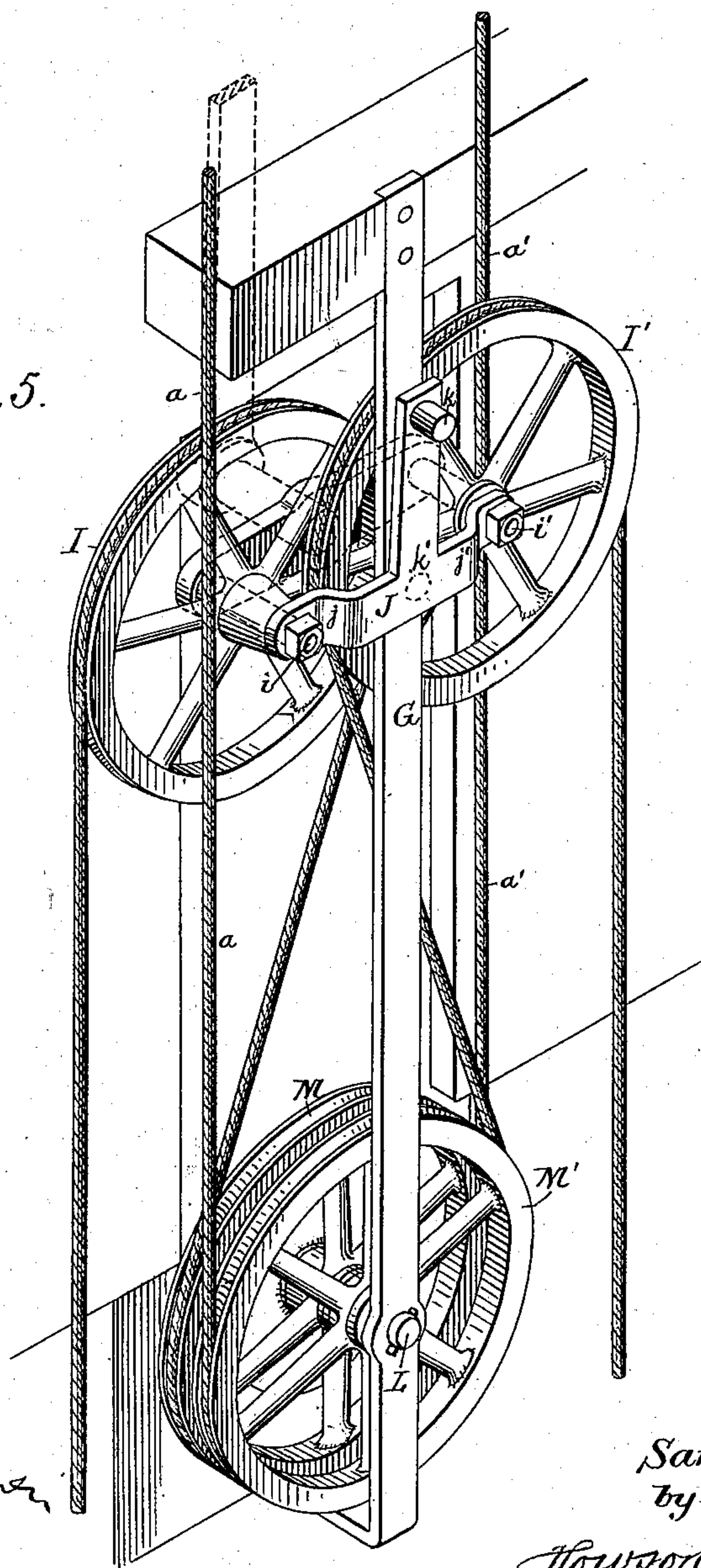


FIG. 5.



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David S. Williams  
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Inventor:  
Samuel E. Stokes  
by his Attorneys  
Howson & Howson



# UNITED STATES PATENT OFFICE.

SAMUEL E. STOKES, OF PHILADELPHIA, PENNSYLVANIA.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 384,096, dated June 5, 1888.

Application filed March 23, 1888. Serial No. 268,274. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL E. STOKES, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Elevators, of which the following is a specification.

My invention consists of certain improvements in devices for controlling the movements of elevator-cars; and it consists of certain mechanism by which two ropes are used to move the controlling-valves.

The broad idea of controlling a rope by the means herein employed is fully set out and claimed in application for patent filed by me on September 24, 1885, Serial No. 178,006.

In the accompanying drawings, Figure 1 is a side view of sufficient of an elevator-car to illustrate my invention. Fig. 2 is an enlarged section on the line 1 2, Fig. 1. Fig. 3 is a sectional plan on the line 3 4, Fig. 1. Fig. 4 is a sectional plan on the line 5 6, Fig. 1; and Fig. 5 is a perspective view of the operating devices detached.

I have illustrated the device as attached to a hydraulic elevator such as is used for passenger travel, and I have omitted the hoisting-ropes and guides for the sake of clearness.

A is the ordinary car and C is the tension device, to which are attached the upper ends of controlling-ropes  $a a'$ , which will be fully described hereinafter, D being the valve-chest, to a lever on which are connected the lower ends of the ropes  $a a'$ . It will be understood that the valve is usually placed in the basement or on the lower floor of the building near the lower portion of the elevator-shaft, and in the present instance it is what is termed a "three-way valve." When the valve is closed, as shown in the drawings, the elevator-car is stationary; but when the lever is in the position shown by dotted lines  $y$  the valve is open to the supply and the elevator-car is ascending. When the lever  $e$  is in the opposite position,  $z$ , the valve is open to the escape and the elevator-car is descending. Connected by a link to the piston-rod  $d$  of the valve is a lever,  $d'$ , on which is a weight,  $d^2$ . This lever is attached to a rock-shaft,  $e'$ , which also carries the lever  $e$ , to which the ropes  $a a'$  are secured.

The upper ends of the ropes  $a a'$ , after passing around pulleys or bearings on the car, as hereinafter described, are secured to the arms

$f$  of a bar, F, which slides in suitable bearings,  $f$ , secured to one side of the elevator-shaft. This bar F is attached by a link to a lever, E, pivoted to the side of the elevator-shaft, and is weighted sufficiently to keep tension always on the ropes for the accurate operation of the valves. The tension device above alluded to is not absolutely necessary, however; and it will be understood that the strain caused by the opening and closing of the valve is insufficient to overcome the counterbalance-weight, so that practically, so far as the operation of the valve is concerned, the upper ends of the ropes may be said to be connected to fixed points. This special feature of the tension device is fully set forth and claimed in the application referred to above.

Adapted to a bearing,  $g$ , on the side of the car A is a shaft, H, having at one end arms  $h h'$ , carrying supporting-spindles  $i i'$ , on which revolve loosely two rope wheels or pulleys I I', set one in advance of the other, as shown in Fig. 4. The outer ends of the spindles are adapted to arms  $j j'$  of a three-armed lever, J, which has a stud,  $k$ , on the third arm,  $j^2$ , for a purpose described hereinafter.

The lever J is pivoted to a bar, G, at  $k'$ , the pivot being directly in line with the shaft H, forming practically a continuation of the shaft. Situated some distance below the shaft H is a stud, L, journaled in bearings in the side of the car A and in the bar G. (See Fig. 3.) On this stud L are two loose pulleys, M M', over which and over the wheels I I' pass the two ropes  $a a'$  in the following manner: The rope  $a$  is attached to the tension device at the top of the elevator-shaft, and extends down around the pulley M, up over the wheel I, and down to one arm of the lever  $e$ , which is attached to the valve. The rope  $a'$ , which is also attached to the tension device at the top, passes down around the pulley M', up over the pulley I', and down to the opposite arm of the lever  $e$ .

I have shown in the drawings the shaft H provided with a handle,  $n$ , and in Fig. 1 I have shown by dotted lines the extreme limits of movement of the handle. In this figure the car is supposed to be stationary, the handle being upright, as at  $x$ ; but if the handle is moved to  $y$  the distance between the wheel I' and the pulley M' will be increased, so as to pull upon the rope  $a'$  and open the valve, thereby caus-



ing the rise of the car A until the valve is shut by the movement of the handle back to the position  $x$ . At the same time the wheel I' is raised the wheel I is moved nearer to the wheel M, thus slackening the rope  $a$  and allowing the lever  $e$  to move. By moving the handle to the position indicated by  $z$  the rope  $a$  will lift the valve and the movement of the different parts will be reversed. The pin  $k$  on the lever J is intended to strike cam-blocks near the top and bottom of the elevator-shaft. These cam-blocks form no part of the present invention, and therefore I have deemed it best to omit them, they being fully explained and covered in the application referred to above.

The use of the handle N need not necessarily be adhered to in the construction of elevators of this class, as a wheel may be used or the gear mechanism shown in the above-mentioned application. It will also be understood that my improvements may be applied to elevators other than hydraulic elevators, and that the ropes  $a$   $a'$  can be attached to a clutch-lever or other device controlling the power, as well as to a valve controlling the motive fluid of a hydraulic or steam elevator.

The modifications above referred to are

shown in the former application, and hence are not illustrated in this application.

I claim as my invention—

1. The combination of ropes attached to a fixture at one end, and a power-controlling device to which the other ends of the ropes are connected, and an elevator-car having pulleys M M', wheels I I', and movable supports for the latter, so that said wheels can be moved toward or from the said pulleys M M', substantially as set forth.

2. The combination of ropes attached to a fixture at one end, and a power-controlling device to which the ropes are also connected, with a car carrying stationary rope-pulleys M M', a two-armed lever carrying pulleys I I', over which the ropes pass, and a lever connected to the two-armed lever for adjusting the rope-pulleys I I' toward and from the rope-pulleys M M', substantially as specified.

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

SAMUEL E. STOKES.

Witnesses:

HARRY SMITH,  
HENRY HOWSON.