

(No Model.)

F. E. HERDMAN.  
ELEVATOR.

No. 480,849.

Patented Aug. 16, 1892.

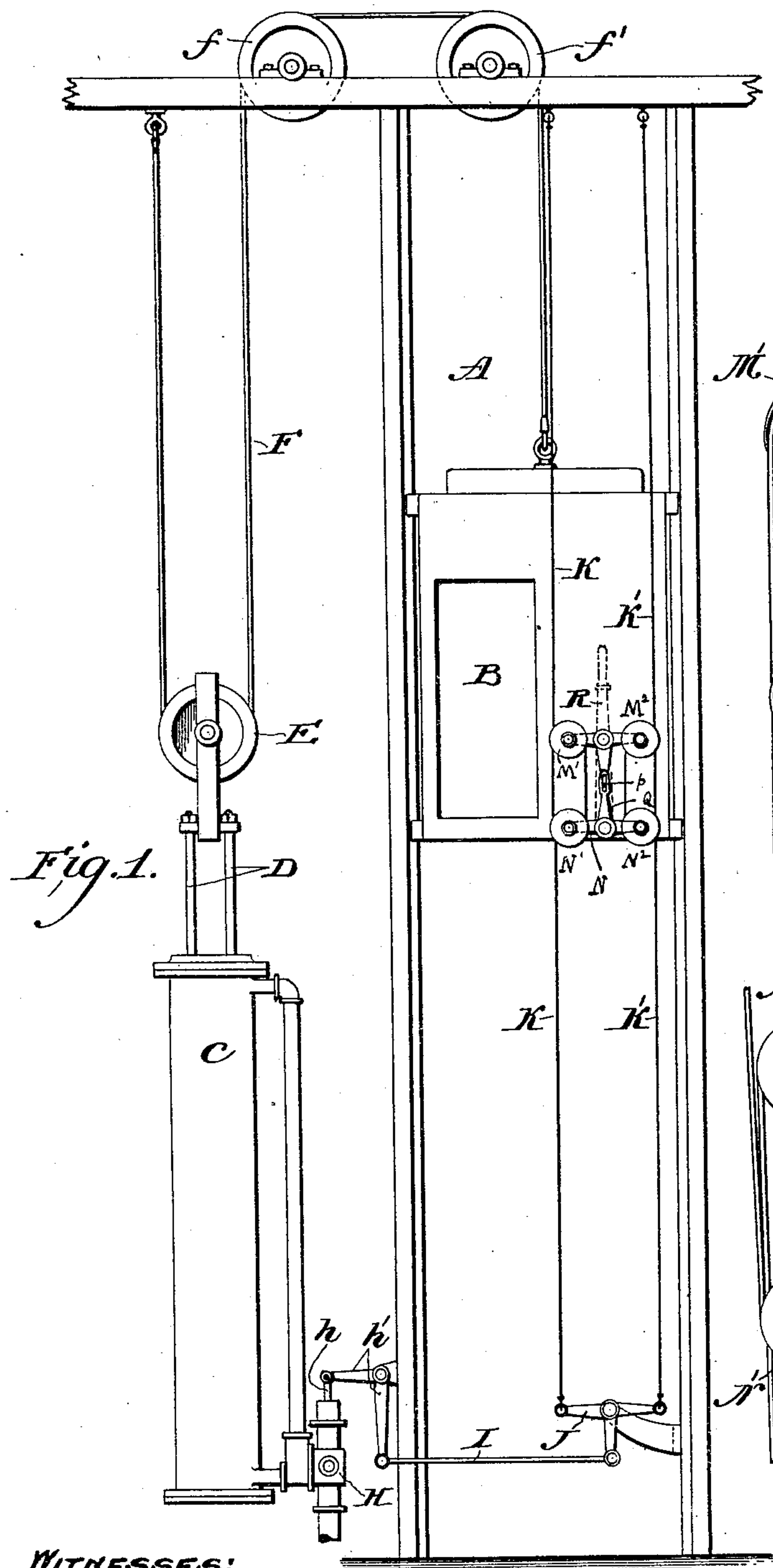


Fig. 1.

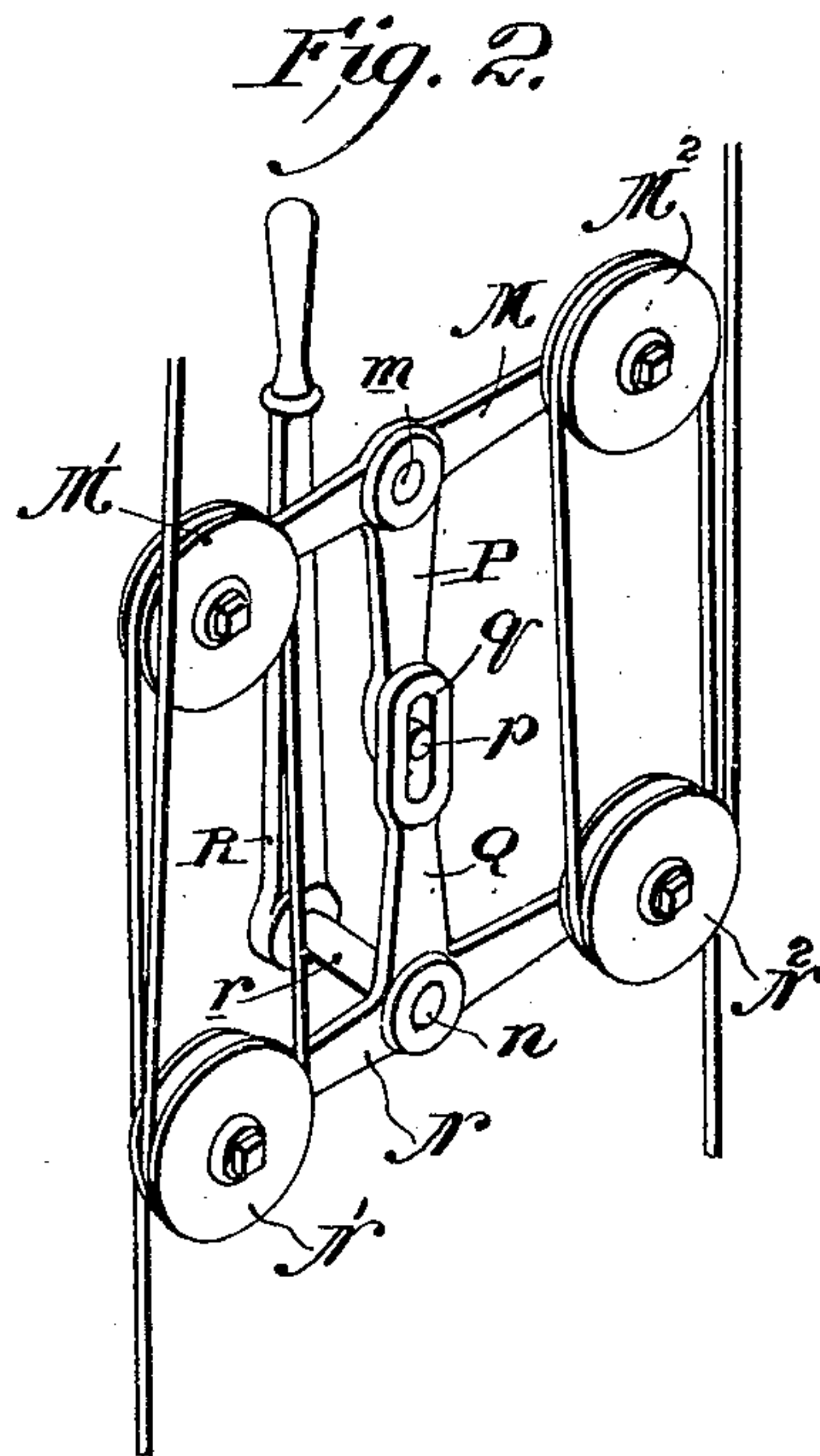


Fig. 2.

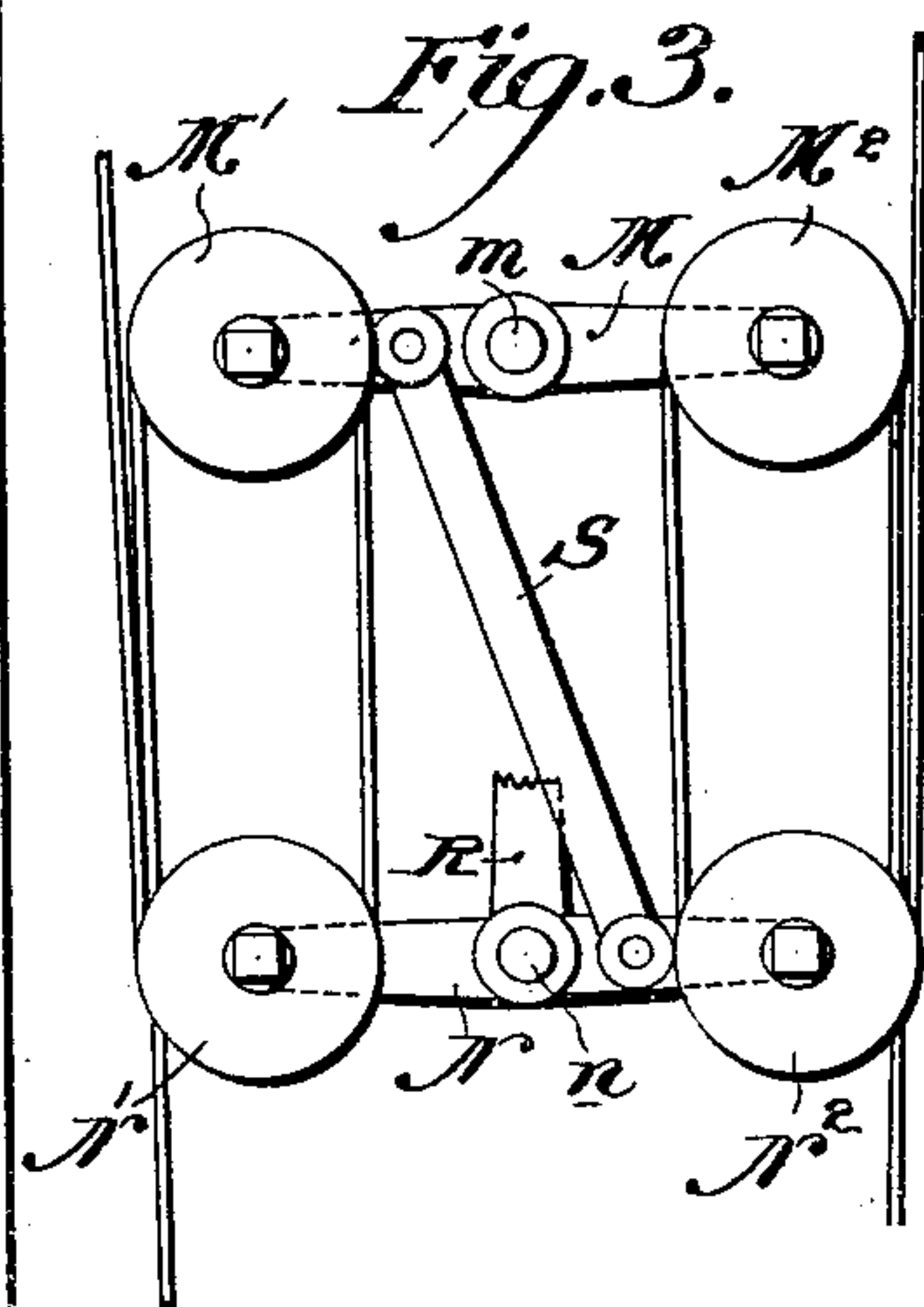


Fig. 3.

WITNESSES:  
David S. Williams,  
Frank S. Bussan

INVENTOR:  
Frank E. Herdman,  
By his atty  
J. P. Herdman

# UNITED STATES PATENT OFFICE.

FRANK E. HERDMAN, OF INDIANAPOLIS, INDIANA.

## ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 480,849, dated August 16, 1892.

Application filed April 13, 1892. Serial No. 428,943. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK E. HERDMAN, a citizen of the United States, residing at Indianapolis, county of Marion, and State of Indiana, have invented a new and useful Improvement in Elevators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention specifically relates to improvements in mechanism for controlling the starting and stopping of the elevator; and it consists in a peculiar arrangement of sheaves, cables, and levers.

My improvement I will describe as applied to a hydraulic elevator, although it is equally adapted to other types of elevators.

In the drawings, Figure 1 is a side elevation of shaft, car, and operating mechanism. Fig. 2 is an enlarged detailed view, in oblique perspective, of the sheaves and of those portions of the cables passing around them. Fig. 3 is a view in said elevation of a modified form of my controlling mechanism.

A is the elevator-shaft; B, the car; C, the hydraulic cylinder; D, the piston-rods connected to the traveling sheave E, and F the lifting-cable, which passes around said sheave, over the pulley  $f f'$ , and is connected to the car B.

H is the valve, which has a valve-rod  $h$  connected to the bell-crank  $h'$ .

I is the rod uniting the lower end of the bell-crank lever  $h'$  with the double bell-crank J.

K and K' are two flexible connections of chain, cord, or other material, and hereinafter called "shipper-cables."

My controlling device is preferably constructed as follows: Attached to two different points on the elevator-car, either without or within, lying in the same vertical plane and preferably one directly above the other, are the two levers M and N. These levers are represented in the drawings as occupying horizontal positions when the elevator-car is at rest and as being pivoted centrally and loosely to the car by the pins  $m$  and  $n$ , respectively. The hand-lever R is shown loosely connected to the stud  $r$  centrally to the lever N, although it may be connected to either le-

ver. To the opposite ends of each of the levers M and N, respectively, are attached the sheaves  $M' M^2$  and  $N' N^2$ .

In Figs. 1 and 2 I show a means of connecting the levers M and N, consisting, first, of a lever P, attached fixedly and centrally to the lever M and when at rest extending vertically downward and provided with the pin  $p$ , and, secondly, of a lever Q, attached fixedly and centrally to the lever N, and when at rest extending vertically upward and provided with the slot  $q$ , adapted to receive the pin  $p$ . The upper lever may, however, be slotted and the lower lever have secured to it the pin, or both levers may be slotted and a pin passed through the slots and capable of moving back and forth therein.

In Fig. 3 I show in side elevation a modified form of lever-connecting mechanism consisting of a straight rod S, one end being loosely attached to the lever M on one side of the pin  $m$ , the other end being loosely attached to the lever N on the other side of the pin  $n$ . The cable K is fastened to the overhead work at the top of the elevator-shaft and passes down to, beneath, and around the sheave  $N'$  up to, above, and around the shaft  $M'$  and down to and connected to one end of the lever J. The cable K' passes in like manner around the sheaves  $N^2$  and  $M^2$  and is connected to the other end of the lever J. The position of the levers, sheaves, and cables are as just described when the elevator is at rest. When the lever R is thrown to the right, the lever N is tipped, the sheave  $N'$  being elevated and the sheave  $N^2$  depressed. The tipping of the lever N in this direction oscillates the lever Q to the right, and the slot  $q$ , moving to the right, will carry with it the pin  $p$ , whereby the lever  $p$  is also oscillated to the right, the lever M tipped, the sheave  $M'$  depressed, and the sheave  $M^2$  elevated. Thus by one movement of the hand-lever to the right the sheaves  $M'$  and  $N'$  are caused to approach each other and the sheaves  $M^2$  and  $N^2$  caused to recede from each other, whereby the cable K' is drawn in a direction upward from the lever J, thus causing the end of the lever J to which the cable is attached to be elevated. At the same time the cable K is slackened, permitting that end



of the lever J to which it is attached to move downward when the other end of the elevator is elevated by the cable K'. The movement of the lever R in the opposite direction—i. e.,  
 5 to the left—lifts the cable K and the end of the lever J to which it is attached and simultaneously slackens the cable K' and permits the other end or the lever J to be depressed, the result being just the opposite to that at-  
 10 tained by the movement of the lever R to the right.

When my modified form of controller (shown in Fig. 3) is used, it will be readily seen that tipping the lever N in one direction  
 15 will tip the lever M in the opposite direction, and thus the same result obtained as in the case of my double-lever, slot-and-pin device. By means of this arrangement of mechanism a movement of the lever R operates the lever  
 20 J, which by the connection hereinbefore described or by any other desired connection is transmitted to the hydraulic-cylinder valve, which in turn operates to regulate the operation of the elevator. This lever J may be  
 25 connected by any desired means with any desired mechanism, steam, hydraulic, or electric.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

30 1. In an elevator, in combination, a car, levers pivoted to said car, intermediate connection between said levers, whereby when one lever is tipped in one direction the other lever will be tipped in an opposite direction,  
 35 and intermediate connection between said levers and the elevator-operating mechanism.

2. In an elevator, in combination, a car, levers pivoted to said car, sheaves pivoted to the opposite ends of each of said levers, in-  
 40 termediate connection between said levers, whereby when one lever is tipped in one direction the other lever will be tipped in an opposite direction, and intermediate connection between said levers and the elevator-op-  
 45 erating mechanism.

3. In an elevator, in combination, a car, levers pivoted to said car, shipper-cables connected to the upper portion of the elevator-

shaft and adapted to be operated by said levers, intermediate connection between said 50 levers, whereby when one lever is tipped in one direction the other lever will be tipped in an opposite direction, and connection between the lower ends of said cables and the elevator-operating mechanism. 55

4. In an elevator, in combination, a car, levers pivoted to said car, sheaves pivoted to opposite ends of each of said levers, shipper-cables connected to the upper portion of the elevator-shaft, one cable passing to and around 60 one sheave of each lever and the other cable passing to and around the other sheave of each lever, intermediate connection between said levers, whereby when one lever is tipped in one direction the other lever will be tipped 65 in an opposite direction, and connection between the lower ends of said cables and the elevator-operating mechanism.

5. In an elevator, in combination, a car, levers pivoted to said car, connecting-rods con- 70 nected to said levers and extending toward each other, one connecting-rod being provided with a slot and the other connecting-rod with a pin adapted to rest in and slide in said slot, and intermediate connection between said le- 75 vers and the elevator-operating mechanism.

6. In an elevator, in combination, a car, levers pivoted to said car, sheaves mounted at the opposite ends of said levers, shipper-ca- 80 bles connected to the upper portion of the elevator-shaft, one cable passing to and around one sheave of each lever and the other cable passing to and around the other sheave of each lever, connecting-rods connected to said 85 levers and extending toward each other, one rod being provided with a slot and the other rod with a pin adapted to rest and slide in said slot, and connection between the lower ends of said cables and the elevator-operat- 90 ing mechanism.

In testimony of which invention I have hereunto set my hand.

FRANK E. HERDMAN.

Witnesses:

W. L. ROBINSON,  
 G. P. SCHMITULAIN.