

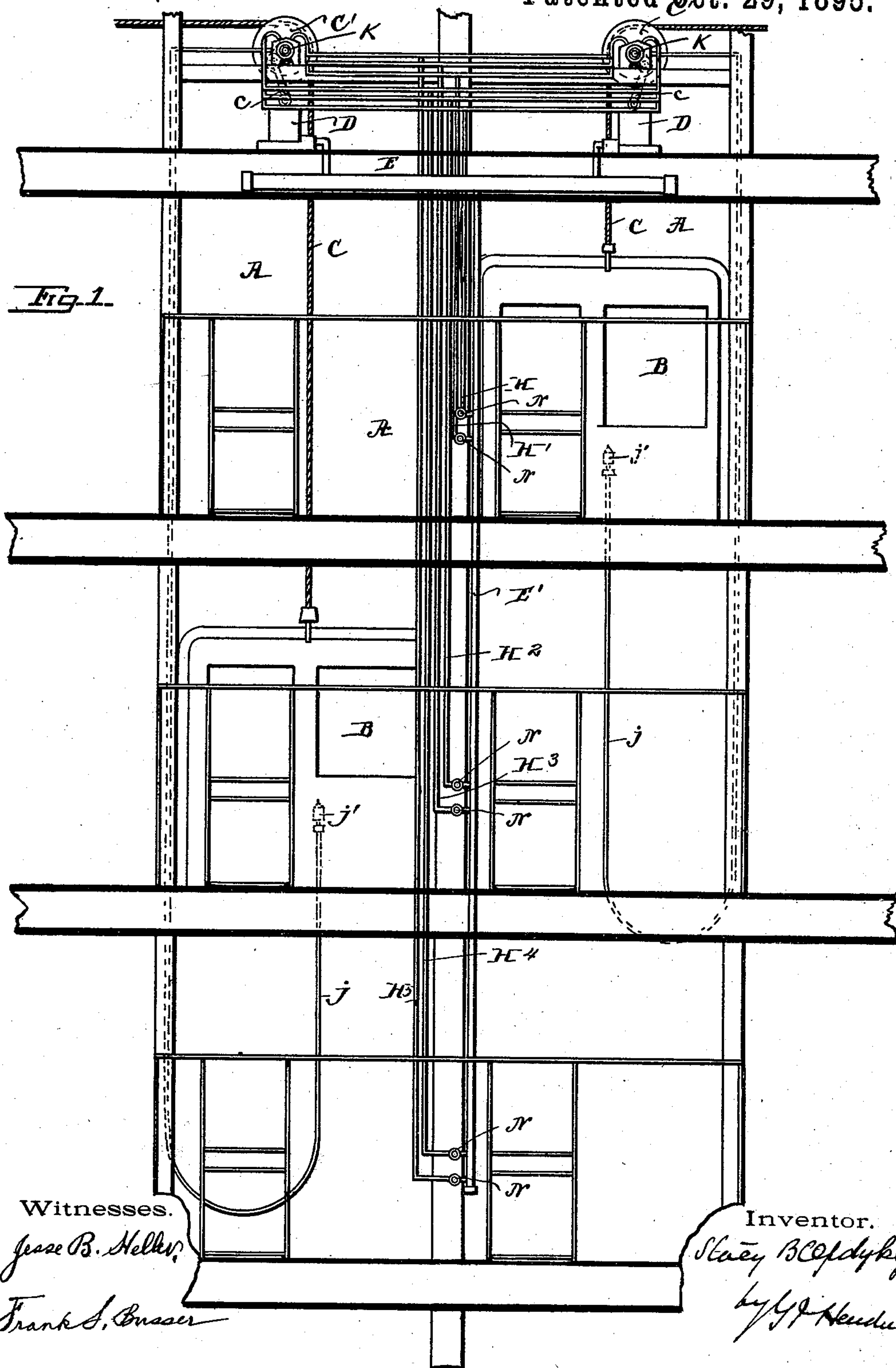
(No Model.)

3 Sheets—Sheet 1.

S. B. OPDYKE, Jr.
PNEUMATIC SIGNAL DEVICE FOR ELEVATORS.

No. 548,722.

Patented Oct. 29, 1895.



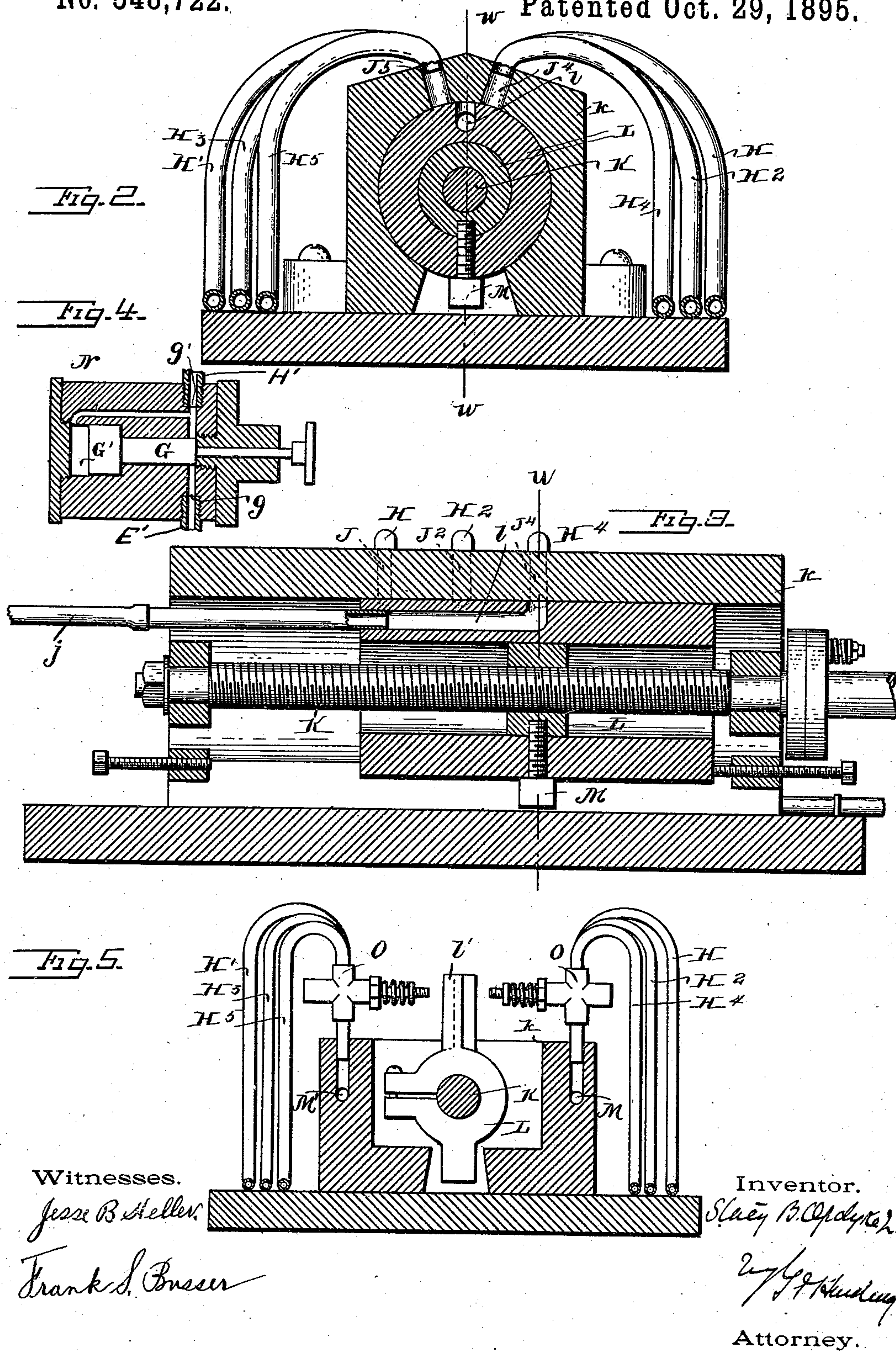
Witnesses.
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3 Sheets—Sheet 2.

No. 548,722.

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3 Sheets—Sheet 3.

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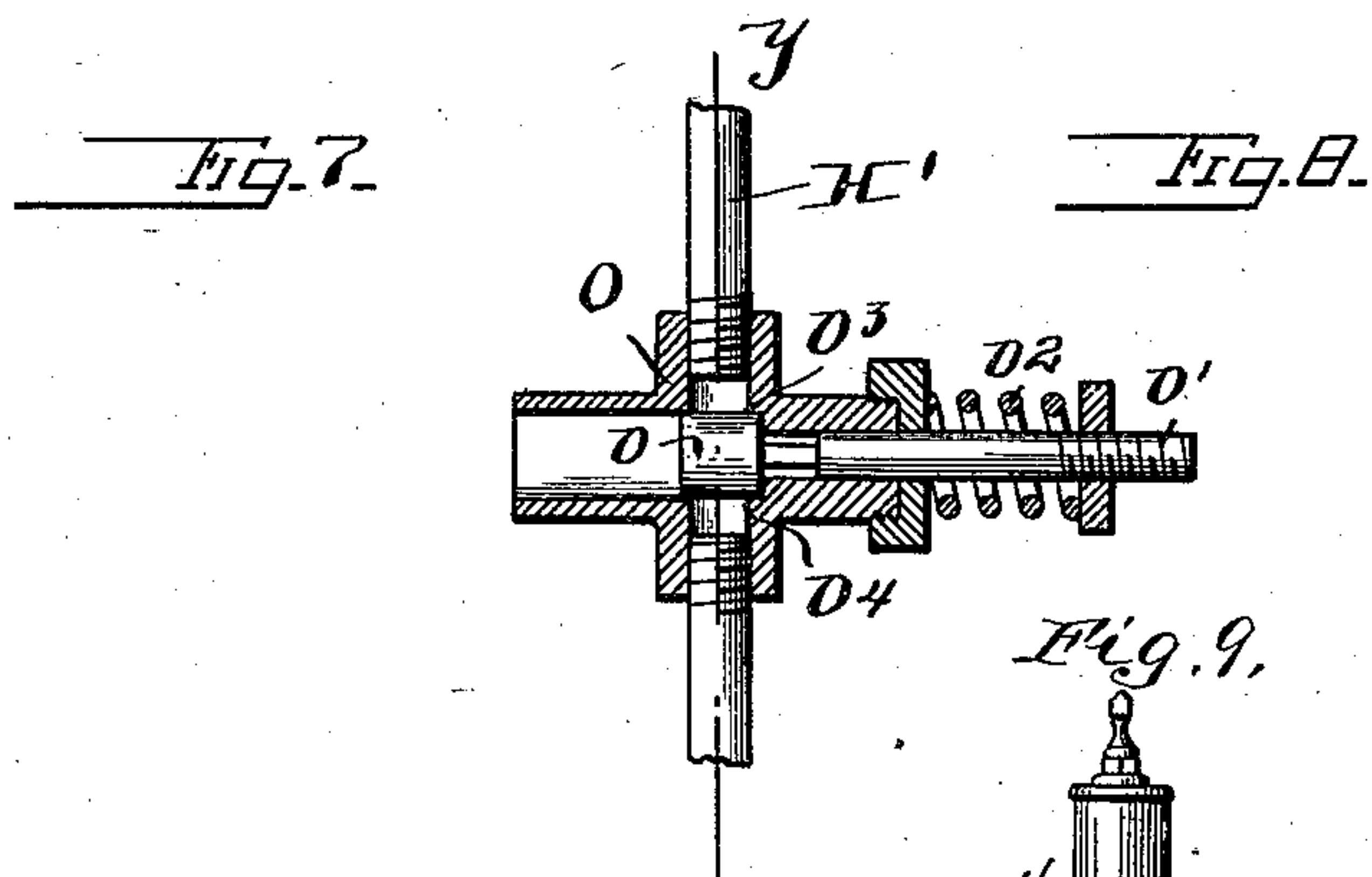
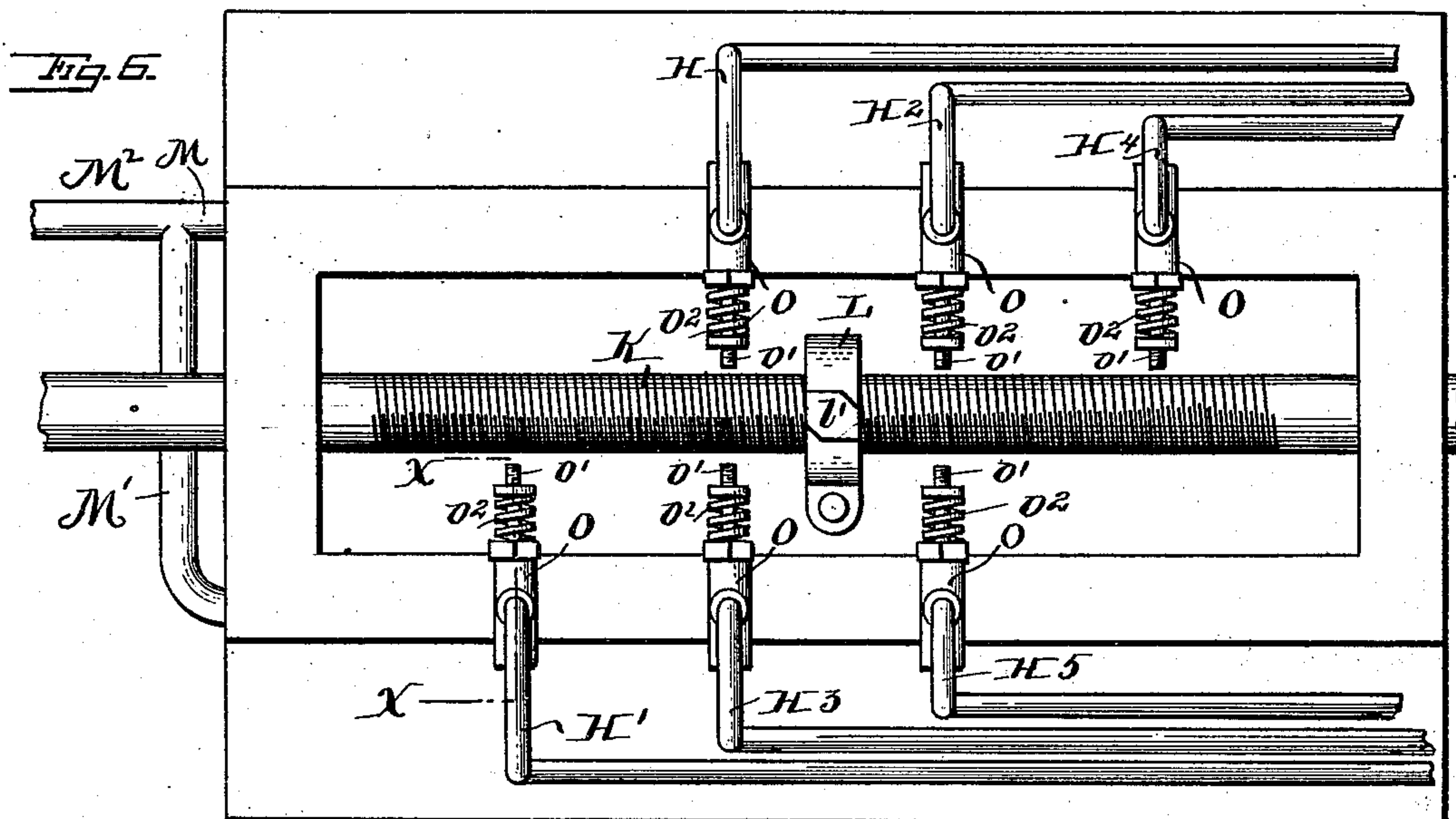
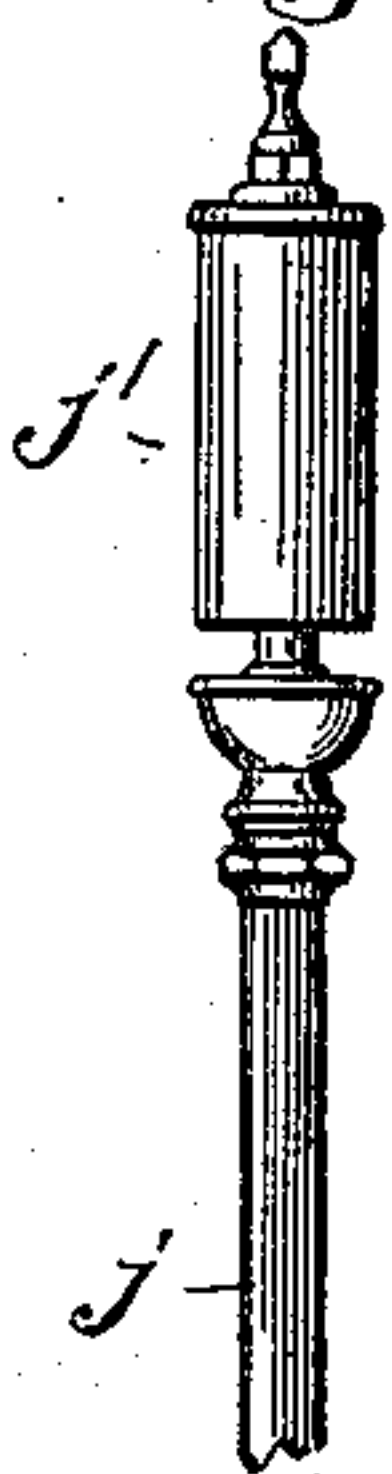
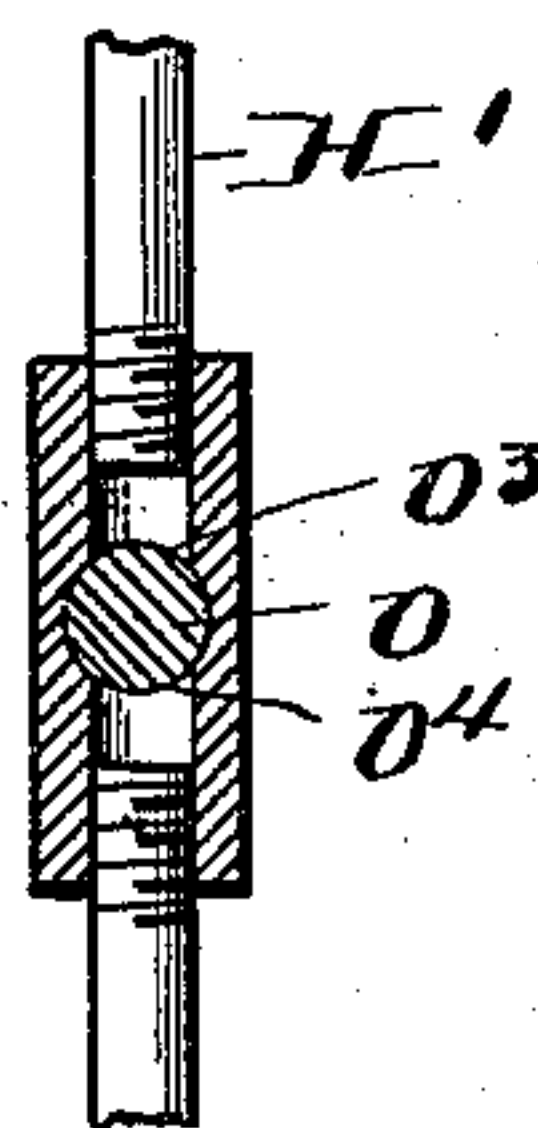


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

STACY B. OPDYKE, JR., OF PHILADELPHIA, PENNSYLVANIA.

PNEUMATIC SIGNAL DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 548,722, dated October 29, 1895.

Application filed January 30, 1895. Serial No. 536,640. (No model.)

To all whom it may concern:

Be it known that I, STACY B. OPDYKE, Jr., a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Pneumatic Signal Devices for 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 has for its object the production of a pneumatic device for use with elevators, whereby the passenger at any floor where a series of elevators is used may set a signal controlled by air which will indicate to the conductor of the first approaching elevator slightly before it reaches the floor that the passenger wishes the said car to stop, there being two sets of devices, either one of which is used, dependent upon whether the passenger desires to ascend or descend.

I will first describe my invention as illustrated in the drawings, and then particularly point out the same in the claims.

In the drawings, Figure 1 is a front view of two elevator-shafts and three floors. Fig 2 is a section on line *nn* of Fig. 3. Fig. 3 is a section on line *ww* of Fig. 2. Fig. 4 is a vertical longitudinal section of the valve. Fig. 5 is similar to Fig. 2 in modified form. Fig. 6 is a plan view of Fig. 5. Fig. 7 is a sectional view on line *xx*, Fig. 6. Fig. 8 is a sectional view on line *yy*, Fig. 7. Fig. 9 is a detail view of the signal in the car.

A is the elevator-shaft.

B B are elevator-cars, two being shown; C, the lifting-cable, which passes around sheave C' at the top. Connected to this sheave by means of a pitman *c* is the piston of a pump D, by means of which air is compressed in the movement of the elevators in either direction, and E is a reservoir for said air. Connected to said reservoir is the main pipe E'.

At each floor are two valve mechanisms N, one to be used for ascending and the other for descending. These valve mechanisms consist, essentially, of a piston G, the cylinder G', in which said piston moves, and the ports *g* and *g'*, port *g* leading or connecting with the pipe E', and the port *g'*, which connects with the pipe H if it be the ascending elevator, there being a pipe connecting the two ports *g*

and *g'*; but which connection is normally closed by the piston G.

There are of course two valve mechanisms for each floor, and there would be a pipe H for each floor corresponding to one valve mechanism and the pipe H' corresponding to the other valve mechanism. So, for the sake of clearness, I will denote the pipes as H H² H⁴ for the three floors for the ascending signal and the pipes H' H³ H⁵ for the descending signal. These pipes H, H', H², H³, H⁴, and H⁵ pass up to the top of the shaft and connect with ports J, J', J², J³, J⁴, and J⁵, the ports J J² J⁴ being in alignment with each other, and the ports J' J³ J⁵ being also in alignment with each other, but out of alignment with the ports J J² J⁴. These ports are in the box *k* of the screw *k*. Upon this screw K is the nut L, which has the port *l*, connected by a flexible hose *j* with a signal *j'* in the corresponding car. This signal may be an ordinary whistle, as shown in detail, Fig. 9. This nut is given a movement relative to the movement of the car by the screw-shaft K being rotated by the shaft of sheave C'. The port *l* is adapted to register with either the ports J J² J⁴ or J', J³, and J⁵ and is caused to register with the ports J J² J⁴ in the movement of the nut in one direction (when the car is ascending) and with the ports J', J³, and J⁵ when it is moving in the other direction (car descending) by the following means: The casing *k* is cut away at the lower portion, (see Figs. 2 and 5,) and to the lower portion of the nut is connected the bolt M, the head of which projects beyond the nut. The first movement of the car ascending or descending causes the nut L to turn with the screw to the right or left, dependent upon whether the car is ascending or descending, bringing the port *l* in position to register with ports J J² J⁴ or J' J³ J⁵, which occurs when the lug strikes the wall of casing *k*, and then the nut travels upon the screw K, and if the car be ascending the port *l* comes successively opposite the ports J, J², and J⁴ and if descending comes successively opposite the ports J' J³ J⁵.

There being a screw K and appurtenant devices for each elevator-car and the pipes H, H', H², H³, H⁴, and H⁵ connecting with corresponding ports J J' J² J³ J⁴ J⁵ of each device, therefore when the passenger operates at any

floor the ascending or descending valve mechanism the first car ascending or descending, depending upon which corresponding valve mechanism is operated, will receive a signal
 5 shortly before reaching that floor, the ports J J' J² J³ J⁴ J⁵ being placed at such position that in the travel of the nut L its port l will register with said ports, whether the car be
 10 ascending or descending, shortly before the car reaches the floor corresponding to said port.

In place of having the ports J J' J² J³ J⁴ J⁵ registering with a port l in the nut L, I can, as shown in Figs. 5, 6, 7, and 8, provide the
 15 pipes H H' H² H³ H⁴ H⁵ each with a spring-valve O, in which o is a piston, which normally closes the ports o³ o⁴ by means of the spring o². This valve O controls the connection between the pipes H H² H⁴ and a pipe M and between
 20 the pipes H' H³ H⁵ and pipe M', and the pipes M and M' connect together in a pipe M², which leads to the hose j, connecting with signal j' in the car. The spring normally acts to hold the valve O closed, thus preventing connection
 25 between pipes H, H', H², H³, H⁴, and H⁵ and their corresponding pipes M and M', the nut L in this case having, as described before, a limited movement with the shaft at the beginning of the rotation of the shaft K in either
 30 direction, but has instead of a port a projection l', which in this movement in one direction is brought in alignment with the valve-stems of the valves controlling pipes H H² H⁴ and in the other direction with the valves controlling pipes H' H³ H⁵, so that when the valve
 35 mechanism corresponding to the pipe at the floor is operated and the projection l' strikes the controlling-valve corresponding to that pipe connection is made between that pipe
 40 and the corresponding pipe M or M' and a signal is given in the car.

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

45 1. The combination with an elevator car, of a main pipe adapted to receive air, a pipe corresponding to each floor, a valve mechanism for each floor connecting said main pipe and said pipe corresponding to said floor,
 50 ports corresponding to said floors, each port being connected with its corresponding floor pipe, a device having a port given a movement relative to the movement of the car, the port of said device being adapted to register
 55 in its movement successively with the ports corresponding to the floors, a signal, and connection between the signal and port of said device.

60 2. The combination with an elevator car, of a main pipe adapted to receive air, a pair of pipes corresponding to each floor, two valve mechanisms for each floor, one mechanism making connection with the main pipe and one of said pair of pipes corresponding to each
 65 floor, and the other making connection with the main pipe and the other of said pair of

floor pipes, a series of ports corresponding to one set of the pairs of floor pipes for each floor, each of said ports being connected to its corresponding floor pipe, a series of ports corresponding to the other of the set of the pairs of floor pipes for each floor, each of said ports being connected to its corresponding floor pipe, a device having a port and given a movement relative to the movement of the car, the
 70 port of said device being adapted in its movement in one direction to register with one series of ports, and in the other direction with the other series of ports, a signal, and connection between the port of said device and the
 80 signal.

3. In combination with a series of elevator cars, a main pipe adapted to receive air, a pipe corresponding to each floor, a valve mechanism for each floor connecting said
 85 main pipe and said pipe corresponding to the floor, ports corresponding to each floor for each elevator, each floor pipe being connected with the corresponding port of each of the elevators, a device, provided with a port, for each
 90 elevator, each device moving relative to its corresponding car, and the port of each device being adapted in its movement to register with its elevator ports corresponding to the floor pipes, a signal for each elevator and connection between the port of each device and
 95 its corresponding signal.

4. The combination with a series of elevator cars, of a main pipe adapted to receive air, a pair of floor pipes corresponding to each
 100 floor, two valve mechanisms for each floor, one mechanism making connection with the main pipe and one of said pair of pipes corresponding to each floor, and the other with the main pipe and the other of said pair of
 105 pipes corresponding to the floor, two sets of series of ports for each elevator, one set of the pair of floor pipes being connected with its corresponding ports, of one series of ports, and the other set of the pair of floor pipes
 110 being connected with its corresponding ports of the other set of series of ports, a device, having a port, for each elevator, and adapted to have a movement relative to its corresponding car, and adapted in its movement in one
 115 direction to register successively with one set of ports corresponding to its elevator and in the other direction with the other set of ports corresponding to its elevator, a signal for each elevator, and connection between the port of
 120 each device and its corresponding signal.

5. The combination with an elevator car, of a main pipe adapted to receive air, a pipe corresponding to each floor, a valve mechanism for each floor connecting said main
 125 pipe and said pipe corresponding to said floor, ports corresponding to said floors, each port being connected with its corresponding floor pipe, a threaded shaft rotated in the movement of the car, a nut upon said shaft, said nut
 130 being provided with a port, the port of said device being adapted to register in its move-

ment successively with the ports corresponding to the floors, a signal, and connection between the signal and the port of device.

6. The combination with an elevator car, of
5 a main pipe adapted to receive air, a pair of
pipes corresponding to each floor, two valve
mechanisms for each floor, one mechanism
making connection with the main pipe and
one of said pair of pipes corresponding to
10 each floor, and the other making connection
with the main pipe and the other of said pair
of floor pipes, a series of ports corresponding
to one set of the pairs of floor pipes for each
floor, each of said ports being connected with
15 its corresponding floor pipe, a series of ports
corresponding to the other of the set of pairs
of floor pipes for each floor, each of said ports
being connected with its corresponding floor
pipe, a threaded shaft rotated in the move-
20 ment of the car, a nut provided with a port
upon said shaft, means to allow said nut to
have a limited movement with said shaft in its
initial movement in either direction whereby,
dependent upon the direction of rotation of
25 the shaft, the port is brought in alignment
with one or the other set of ports correspond-
ing to the floors, and adapted in the further
movement of the shaft to register successively
with the ports with which it is brought into
30 alignment, a signal, and connection between
the port of device and the signal.

7. In combination with a series of elevator
cars, a main pipe adapted to receive air, a
pipe corresponding to each floor, valve mech-
anism for each floor connecting the main pipe
and said pipe corresponding to the floor, ports
corresponding to each floor for each elevator,
each floor pipe being connected with the cor-
responding port of each of the elevators, a
35 threaded shaft for each elevator rotated in
the movement of its corresponding car, a nut
provided with a port for each shaft, the port
of each nut being adapted in the movement
of the nut to register with its elevator ports
40 corresponding to the floor pipes, a signal for
each elevator, and connection between the
port of each device and its corresponding
signal.

8. The combination with a series of eleva-
50 tor cars, of a main pipe adapted to receive air,
a pair of pipes corresponding to each floor,
two valve mechanisms for each floor, one mech-
anism making connection with the main pipe
and one of said pair of pipes corresponding
55 to each floor, the other between the main pipe
and the other of said pair of pipes, two sets
of series of ports for each elevator, one set of

the pair of floor pipes being connected with
its corresponding ports of one set of ports,
and the other set of the pair of floor pipes be- 60
ing connected with its corresponding ports of
the other set of ports, a threaded shaft for
each elevator rotated in the movement of its
corresponding car, a nut, provided with a port,
for each shaft, means to limit the movement 65
of the nut with its shaft in its initial move-
ment in either direction whereby, dependent
upon the direction of rotation of the shaft, the
port of its corresponding nut is brought in
alignment with one or the other set of its cor- 70
responding floor ports and is adapted to reg-
ister successively with said ports in the
further rotation of said shaft, a signal for
each elevator, and connection between the
port of each nut and its corresponding signal. 75

9. The combination with an elevator car, of
a main pipe adapted to receive air, a pipe cor-
responding to each floor, a valve mechanism
for each floor connecting said main pipe and
said pipe corresponding to said floor, a signal, 80
and connection between the floor pipe and the
signal.

10. The combination with an elevator car,
of a main pipe adapted to receive air, a pipe
corresponding to each floor, a valve mechan- 85
ism for each floor connecting said main pipe
and said pipe corresponding to said floor, a
signal, a device given a movement relative to
the movement of the car and adapted in its
movement to cause connection to be made suc- 90
cessively between the floor pipes and signal.

11. The combination with an elevator car,
of a main pipe adapted to receive air, a pair
of floor pipes corresponding to each floor, two
valve mechanisms for each floor, one mech- 95
anism making connection with the main pipe
and one of said pair of pipes corresponding
to each floor, and the other making connec-
tion with the main pipe and the other of said
pair of floor pipes, a signal, a device given a 100
movement relative to the movement of the
car and adapted in its movement in one di-
rection to cause necessary connection to be
made successively between one set of floor
pipes and the signal, and in the other direc- 105
tion successively between the other set of
floor pipes and the signal.

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

STACY B. OPDYKE, JR.

Witnesses:

FRANK S. BUSSE,
M. FRANCES ELLIS.