

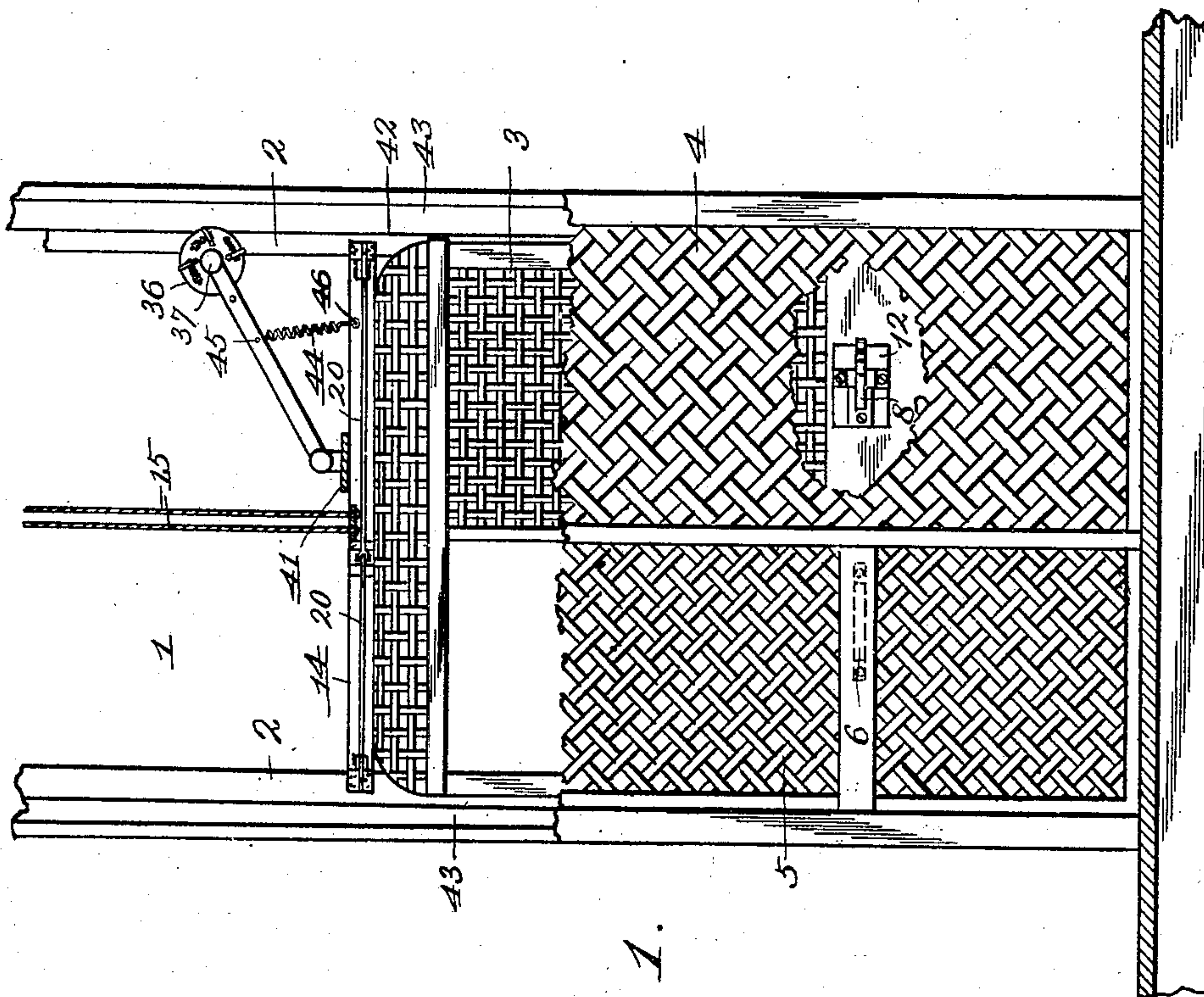
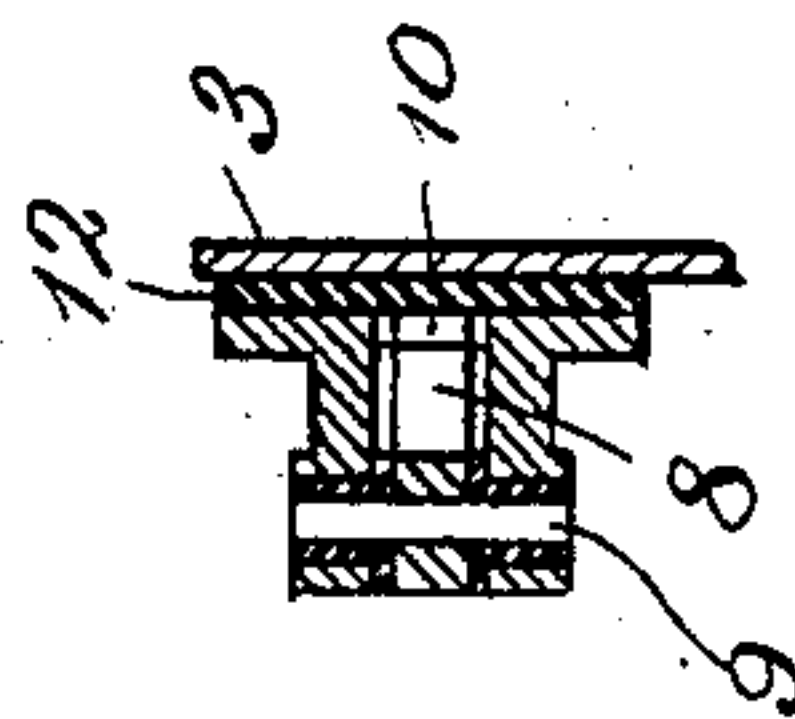
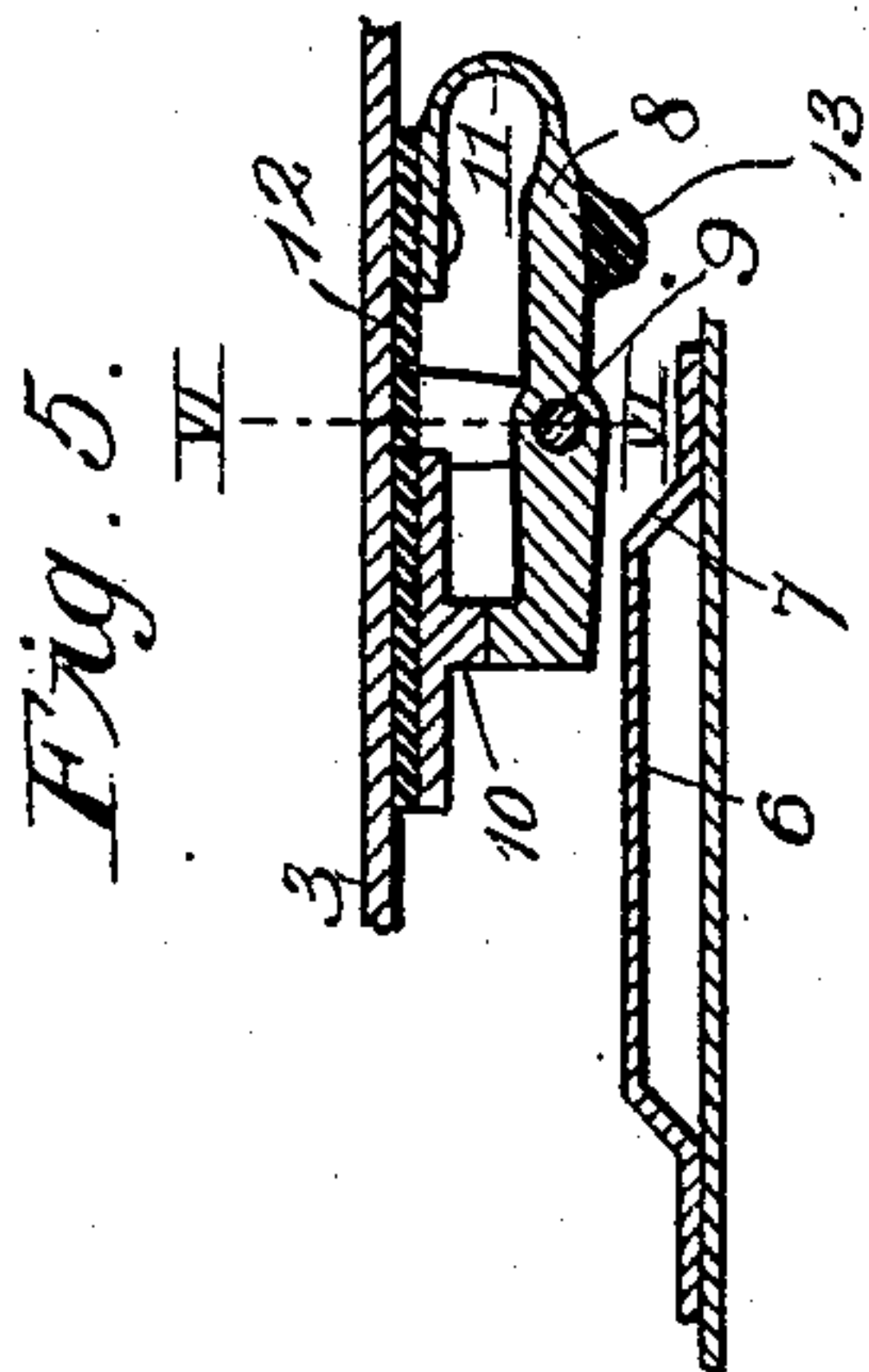
No. 890,797.

PATENTED JUNE 16, 1908.

G. B. RICE.
ELEVATOR SAFETY DEVICE.

APPLICATION FILED JUNE 4, 1906.

3 SHEETS—SHEET 1.



Witnesses:

R. Hamilton.
J. Moore.

Fig. 1.

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By F. G. Fischer
att'y.

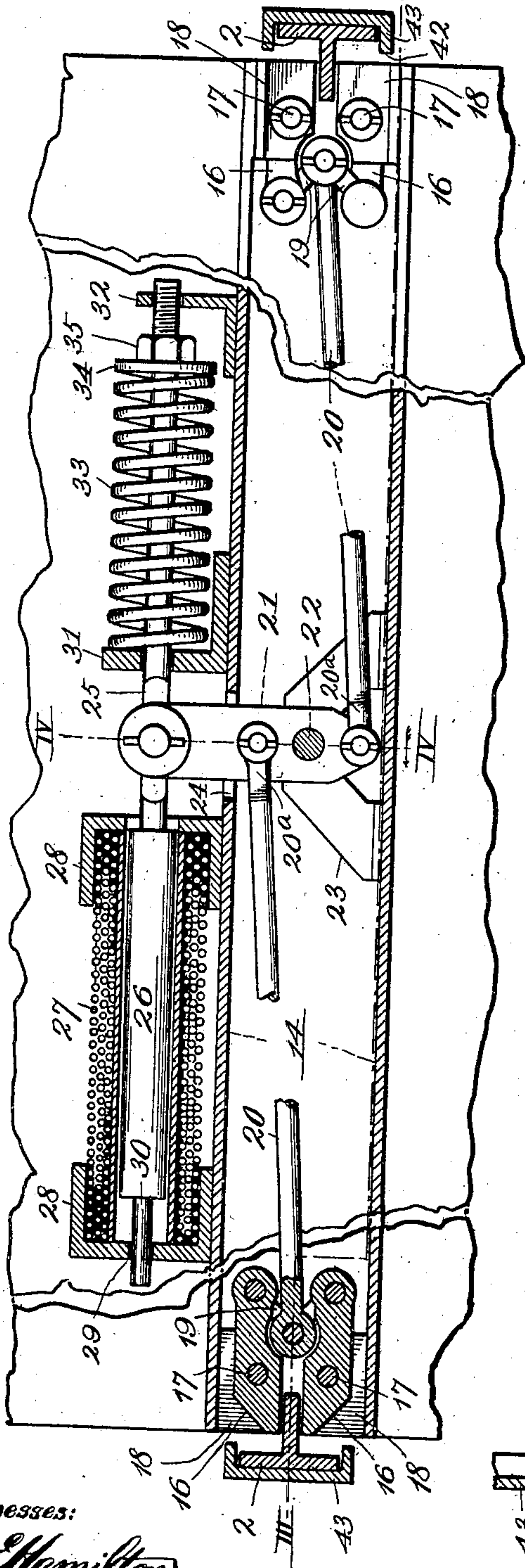
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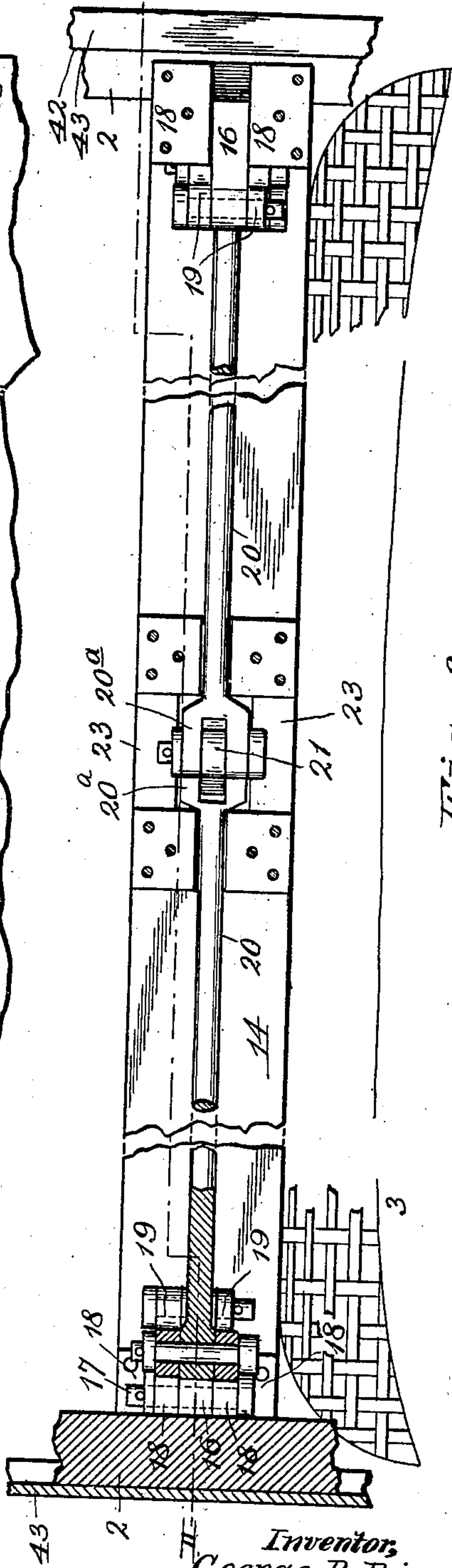
3 SHEETS—SHEET 2.

Fig. 2.



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Fig. 3.



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3 SHEETS—SHEET 3.

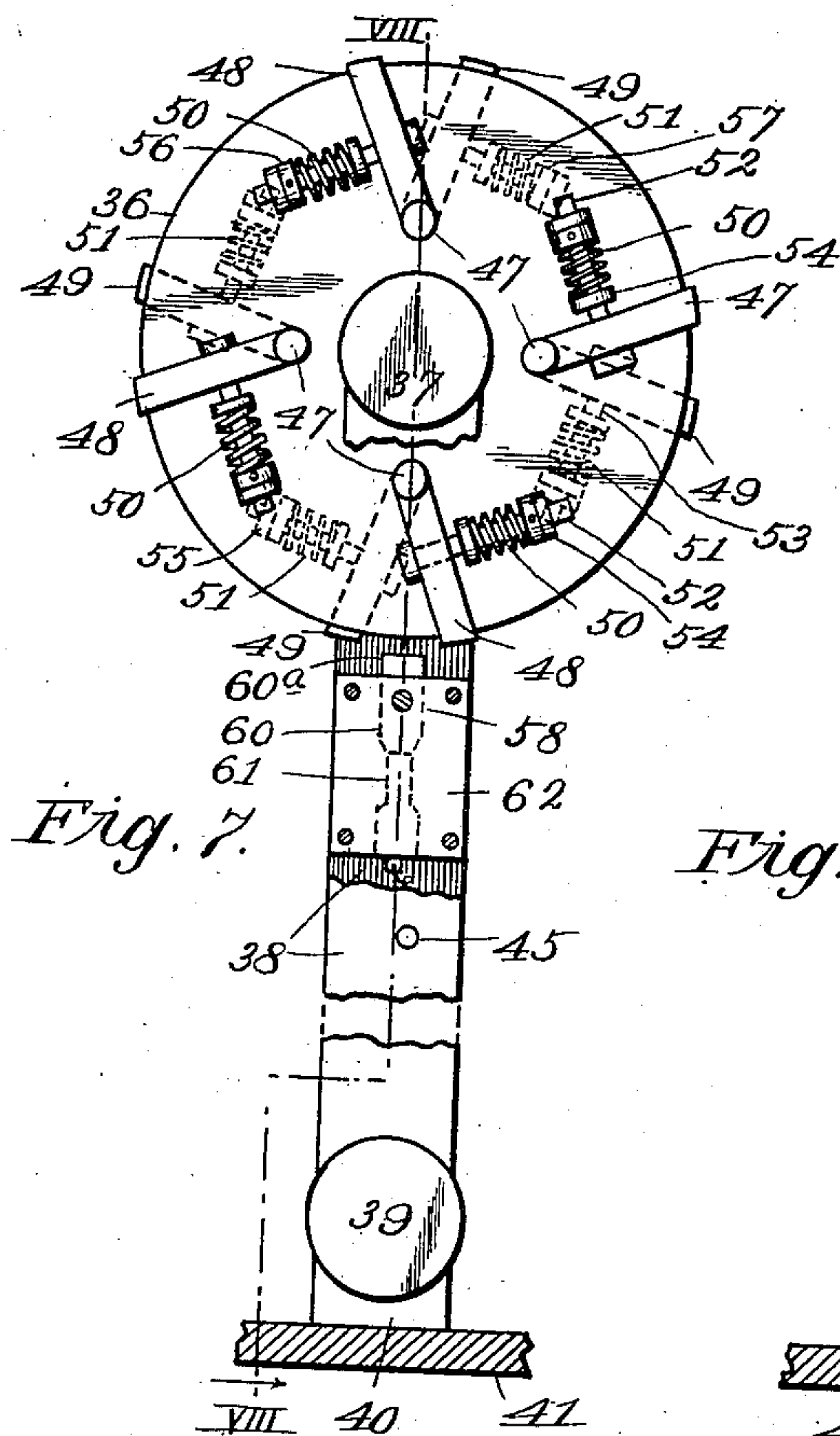


Fig. 7.

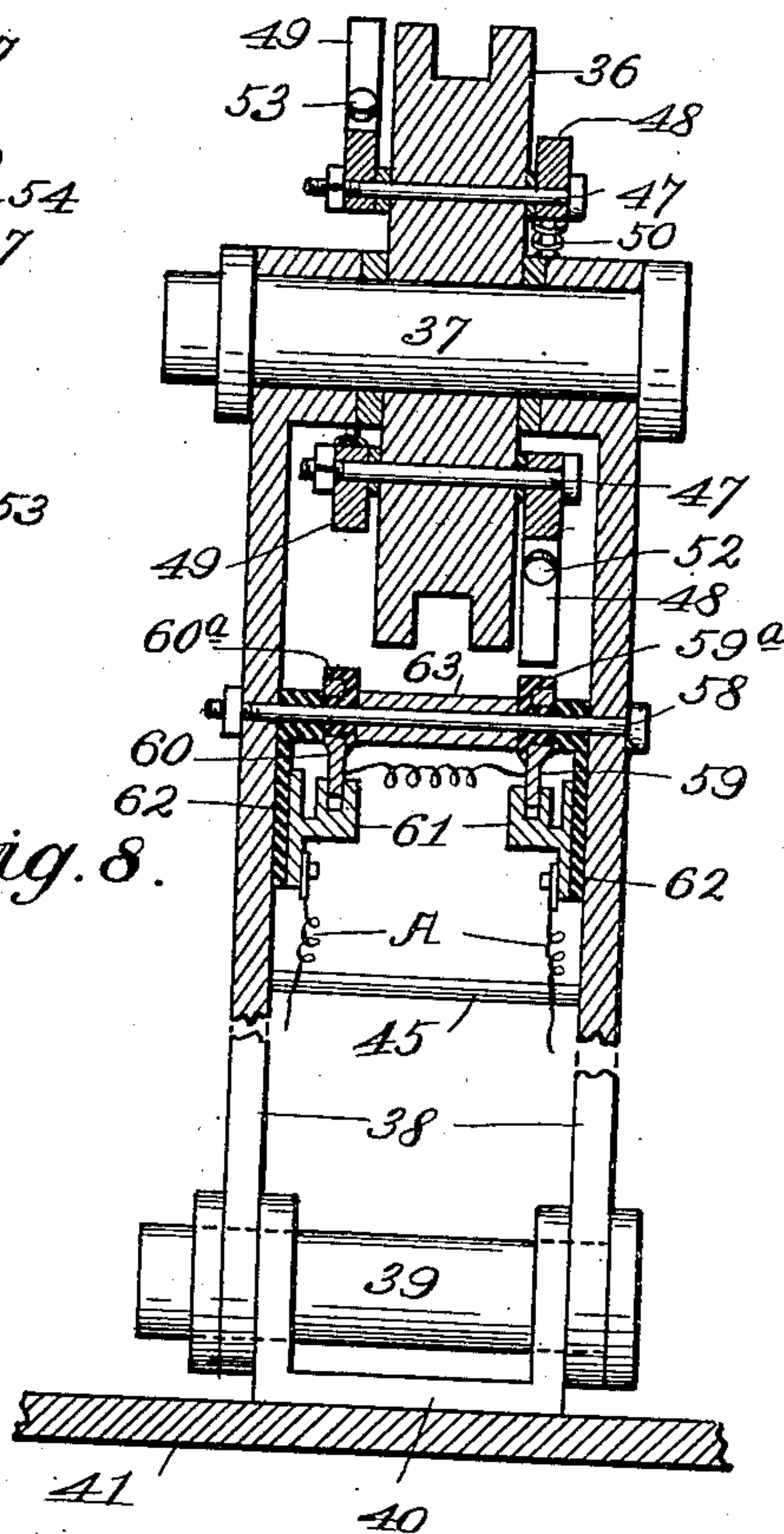


Fig. 8.

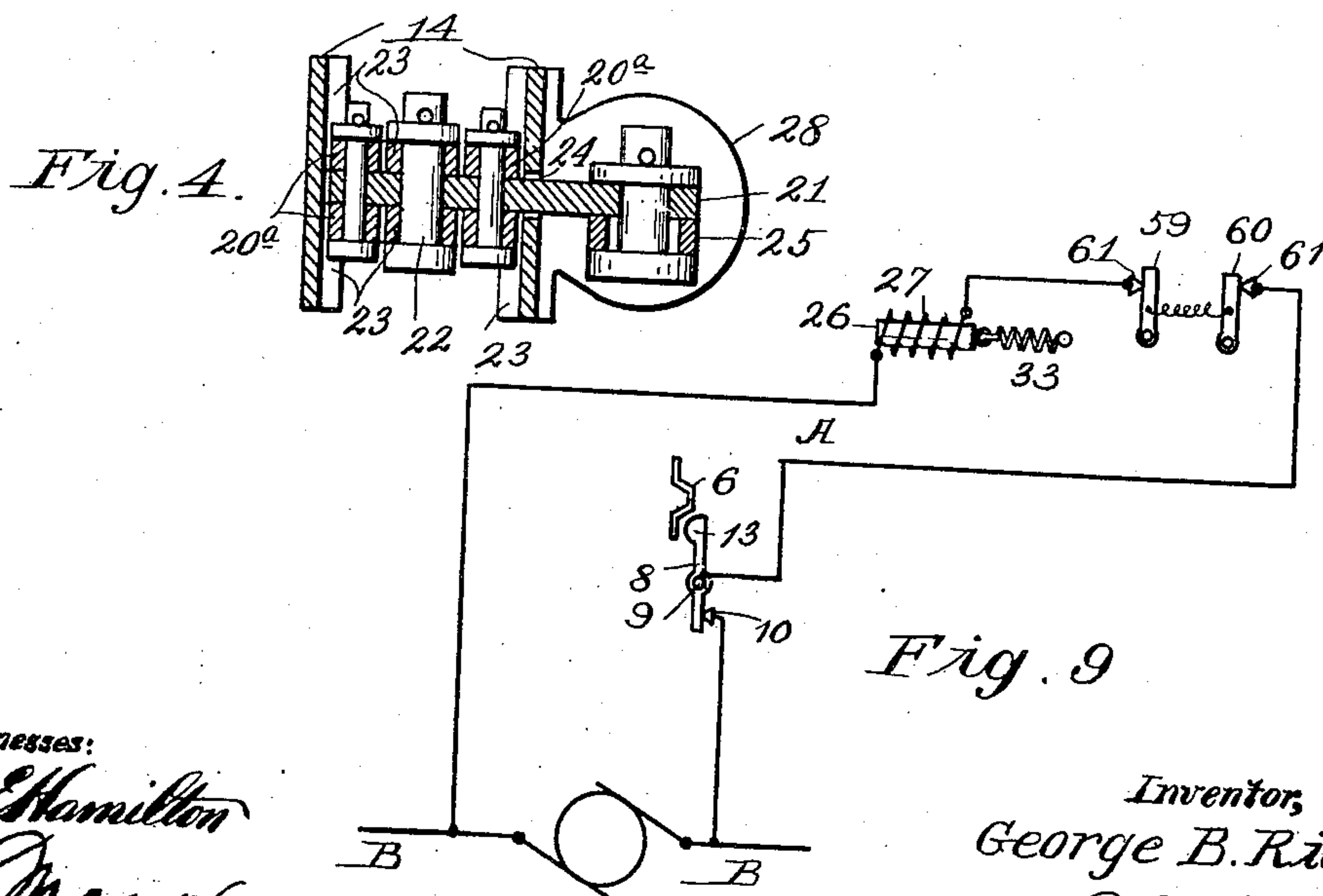


Fig. 9

Witnesses:

R. Hamilton
J. Moore

Inventor,
George B. Rice
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UNITED STATES PATENT OFFICE.

GEORGE B. RICE, OF SEWICKLEY, PENNSYLVANIA.

ELEVATOR SAFETY DEVICE.

No. 890,797.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed June 4, 1906. Serial No. 319,982.

To all whom it may concern:

Be it known that I, GEORGE B. RICE, a citizen of the United States, residing at Sewickley, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Elevator Safety Devices, of which the following is a specification.

My invention relates to improvements in safety devices for elevator cars, and embodies means for automatically stopping said cars should they attain abnormal speed.

The invention further consists in the novel construction, combination and arrangement of parts hereinafter described, pointed out in the claims, and illustrated in the accompanying drawings, in which:—

Figure 1 represents a broken front elevation of an elevator-shaft with a car arranged to travel therein in the customary manner. Fig. 2 is a sectional plan view on line II of Fig. 3, showing an electro-mechanical appliance forming part of the invention. Fig. 3 is a side elevation of same partly in section on line III of Fig. 2. Fig. 4 is a transverse section on line IV—IV of Fig. 2. Fig. 5 is a sectional plan view of a circuit-breaker and means for actuating the same. Fig. 6 is a cross-section of the same on line VI—VI of Fig. 5. Fig. 7 is a broken side elevation of a speed-governor forming part of the invention. Fig. 8 is a central section of the same on line VIII—VIII of Fig. 7. Fig. 9 is a diagram of an electric circuit employed in carrying out the invention.

1 designates the elevator shaft provided at its sides with the customary guide-strips 2.

3 designates the car arranged to traverse the shaft, which latter is closed at each landing by the customary grille 4 and sliding-door 5.

6 designates a bracket fixed to the inner side of the door in the shaft and provided with a beveled end 7 adapted to actuate a circuit-breaker fixed to the front wall of the car. Said circuit-breaker consists of a lever 8 fulcrumed upon a pin 9 and having one end normally held in engagement with a contact point 10 by its opposite resilient end 11. Contact point 10 and the resilient end 11 are fixed to non-conducting material 12 secured to the front wall of the car. Lever 8 is provided with a knob of nonconducting material 13 which is engaged by bracket 6 when the door in the shaft is opened, and forced

towards the wall of the car until the end of lever 8 is disengaged from the contact point 10. When the circuit-breaker is thus opened an electrical current passing therethrough is interrupted and permits two sets of jaws, hereinafter described, to engage the guide-strips 2 with sufficient force to lock the car at the landing until the door is closed. When the latter operation takes place bracket 6 is drawn out of engagement with knob 13 and permits resilient end 11 to force the opposite end of the lever into engagement with contact point 10. This arrangement obviates accidents due to passengers leaving or entering the car at landings while the car is in motion.

14 designates a pair of beams fixed to the top of the car, said beams being, preferably, those to which the hoisting cables 15 are attached, but, if desired, special beams can be employed and fixed either to the top or bottom of the car as convenience may dictate.

16 designates two sets of jaws arranged in pairs at the ends of the beams, the jaws of each pair being located at the opposite sides of a guide-strip so that they may grip the latter at the proper time and lock the car from upward or downward movement. Said jaws are fulcrumed upon pins 17 extending through brackets 18 secured to the adjacent sides of beams 14, and are actuated through the instrumentality of links 19 pivoted at their ends to the rear terminals of the jaws and to the terminals of a pair of oppositely-extending connecting-rods 20, forming toggles whereby the jaws are simultaneously actuated.

The inner ends 20^a of connecting-rods 20 are bifurcated to straddle a transmitting lever 21, to which they are pivotally secured at opposite sides of its fulcrum 22 mounted in a pair of brackets 23 secured to the inner side of one of beams 14. Lever 21 extends through a slot 24 in the opposite beam and is pivotally secured at its outer end to a stem 25 integral with the plunger 26 of a solenoid consisting of said plunger and a magnet 27. The magnet of the solenoid is fixed to the adjacent beam 14 by a pair of collars 28, one of which has a small central opening 29 in which a guide-pin 30, extending from the adjacent terminal of the plunger, operates. Said guide-pin consists of brass or other non-magnetic metal to prevent the collar from becoming magnetized by the current passing

through the solenoid. Stem 25 also consists of brass and at the other side of lever 21 it extends through an abutment 31 and a guide 32 secured to the side of the adjacent beam 14.

33 designates an expansion-spring encircling stem 25 and interposed between the abutment 31 and a washer 34 which latter is held in engagement with the spring by a nut 35 adjustably engaging the threaded terminal of the stem.

In practice the solenoid is normally magnetized to hold the parts in the position shown in Fig. 2 against the action of spring 33, but should the current be interrupted the spring will immediately expand and, through the instrumentality of the intervening mechanism, close the jaws upon the guide-strips with sufficient power to lock the car from further movement. Spring 33 is made light as possible to offer but minimum resistance to the solenoid, but its power is compounded sufficiently to hold the car, by lever 21, links 19, and jaws 16.

36 designates a grooved governor-wheel mounted upon a shaft 37, carried at the upper ends of a pair of arms 38, pivoted at their lower terminals upon a shaft 39, mounted in a bracket 40, on a transverse plate 41 secured to the tops of beams 14. Wheel 36 is held in engagement with edge 42 of one of channel-bars 43 by a retractile spring 44 attached at its ends to cross-rods 45 46 secured to arms 38 and beams 14, respectively.

47 designates a plurality of bolts extending transversely through the governor-wheel and provided at their ends with oppositely-disposed pivotally-mounted weights 48 49, normally held in the positions shown in Fig. 7 by expansion-springs 50 51 embracing rods 52 53 loosely connected to weights 48 49, respectively. Rods 52 53 extend through guides 54 55 secured to the adjacent sides of the governor-wheel and are embraced by fixed collars 56 57 against which the springs 50 51, respectively, abut, and normally hold them against the adjacent guides.

58 designates a bolt extending through arms 38 a short distance beneath the governor-wheel and provided with another circuit-breaker consisting of a pair of pivotally mounted switch-blades 59 60, normally held in engagement with sockets 61, secured to arms 38 and insulated therefrom by nonconducting material 62 the upper ends of which embrace bolt 58 and, in conjunction with a spacing-sleeve 63, hold the blades in vertical alinement with weights 48 49.

Should the car descend with abnormal speed weights 48 will be thrown outwardly by centrifugal force against the action of springs 50, so that one of them will strike the upper terminal 59^a of blade 59 and disconnect the latter from its socket. Should the car ascend at abnormal speed weights 49

will contact with the upper terminal 60^a of blade 60 and disengage the latter from its socket.

As the circuit-breaker formed by blades 59 60 and sockets 61 is in circuit with the solenoid, the interruption of the circuit caused by either of the switches being disconnected from its socket will demagnetize the solenoid and permit spring 33 to set the jaws. Collars 56 57 are preferably adjustable so that the tension of springs 50 51 may be regulated as desired.

As shown in the diagram, Fig. 9, the solenoid, the circuit-breaker carried by the car wall, and the circuit-breaker carried by the governor frame are arranged in series, they being connected by a circuit-wire A communicating with the motor-circuit B. The current through circuit A, however, may be derived from any other convenient source when the car to which my invention is applied is propelled by other than electrical power. It is also obvious that a switch in circuit A may be arranged within the car in easy reach of the conductor so as to form still another circuit-breaker by which the car may be instantly stopped at any desired point.

Having thus described my invention what I claim and desire to secure by Letters-Patent, is:—

1. The combination with an elevator shaft having vertical strips, the car, spring actuated jaws thereon for gripping the strips, and a device for normally holding said jaws open; of a governor wheel carried by the car and rotated by contact with one of the strips, bolts through the wheel, weights pivotally mounted on the opposite ends of each bolt, independent springs holding the weights of each pair normally at opposite sides of a radius through their bolt, two pivoted plates standing respectively in the planes of the weights at opposite sides of the wheel, and connections between said device and plates whereby the movement of either of the latter will trip the former and permit the setting of the grips.

2. The combination with an elevator shaft having vertical strips, the car, spring actuated jaws thereon for gripping the strips, and an electrical device for normally holding said jaws open; of a governor wheel carried by the car and rotated by contact with one of the strips, bolts through the wheel, weights pivotally mounted on the opposite ends of each bolt, independent springs holding the weights of each pair normally at opposite sides of a radius through their bolt, circuit breakers standing respectively in the planes of the weights at each side of the wheel, and a circuit including said electrical device and both the circuit breakers in series.

3. The combination with an elevator shaft having vertical strips, the car, jaws thereon adapted to grip said strips, mechanism for

actuating said jaws, and an electrical device
for normally holding said mechanism inoper-
ative; of arms pivoted on the car, a governor
wheel journaled in their outer ends and ro-
tated by contact with an upright bar of the
shaft, a spring actuating said arms to throw
the wheel into operative position, devices on
the wheel movable radially under centrifugal
force, a circuit-breaker adapted to be oper-
ated by any of said devices when projected,
and a circuit including said circuit-breaker
and said electrical device.

4. The combination with an elevator shaft
having vertical strips, the car, jaws thereon
adapted to grip said strips, mechanism for
actuating said jaws, and an electrical device
for normally holding said mechanism inopera-

tive; of a frame pivoted on the car, a gov-
ernor wheel therein and resting against an
upright bar of the shaft, a series of oppo-
sately disposed weights pivoted in said wheel
and adapted to be swung outward under cen-
trifugal force, switch plates pivoted on said
frame in the path of said weights when pro-
jected, sockets with which said plates nor-
mally contact, and a circuit including said
electrical device and both the switch
plates and their sockets in series.

In testimony whereof I affix my signature,
in the presence of two witnesses.

GEORGE B. RICE.

Witnesses:

F. G. FISCHER,
J. MOORE.