

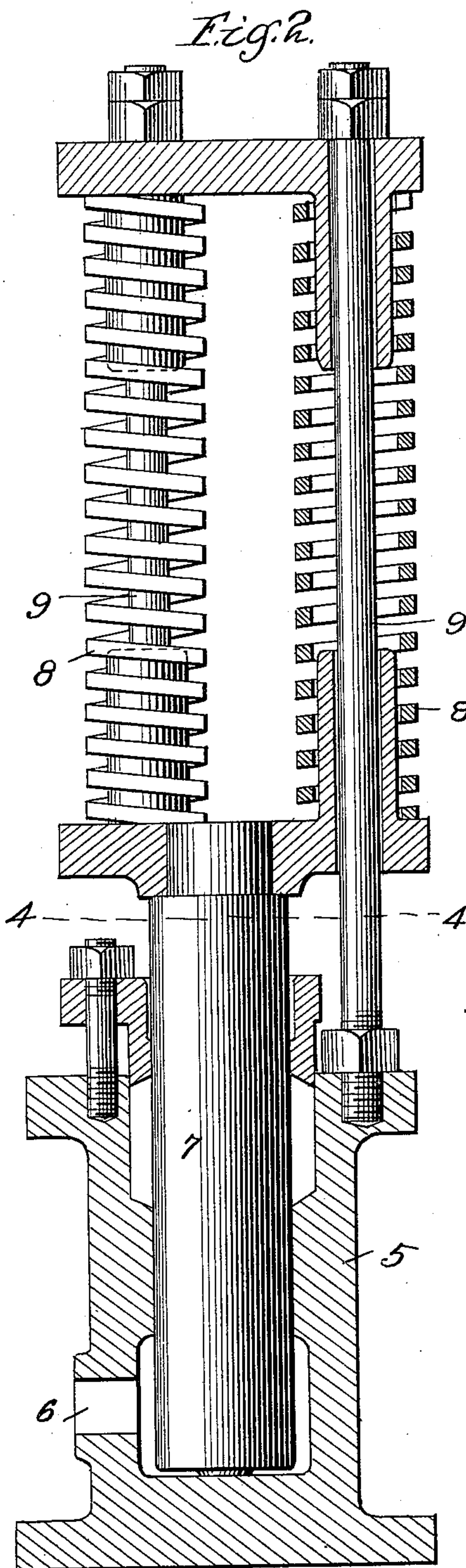
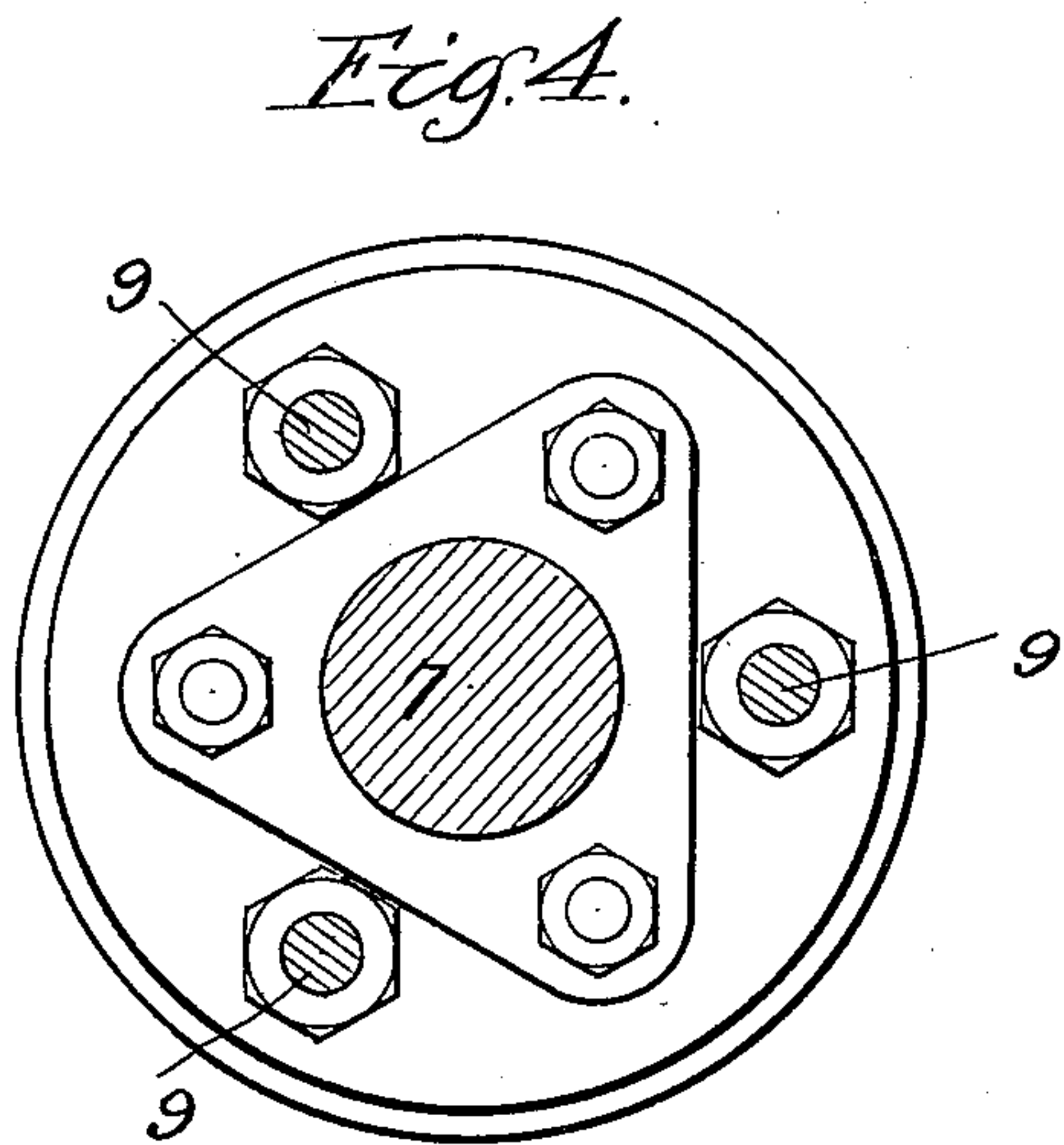
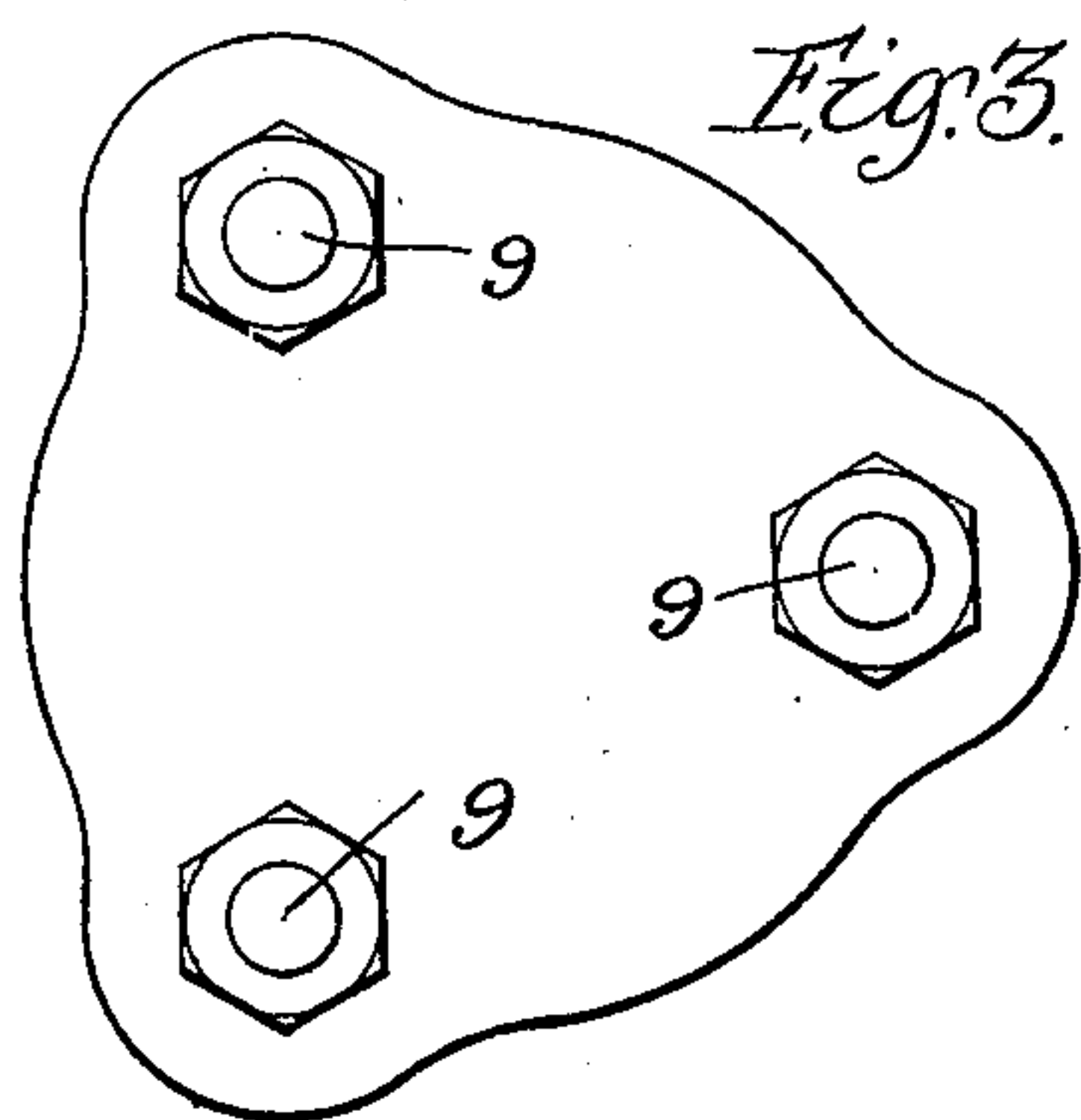
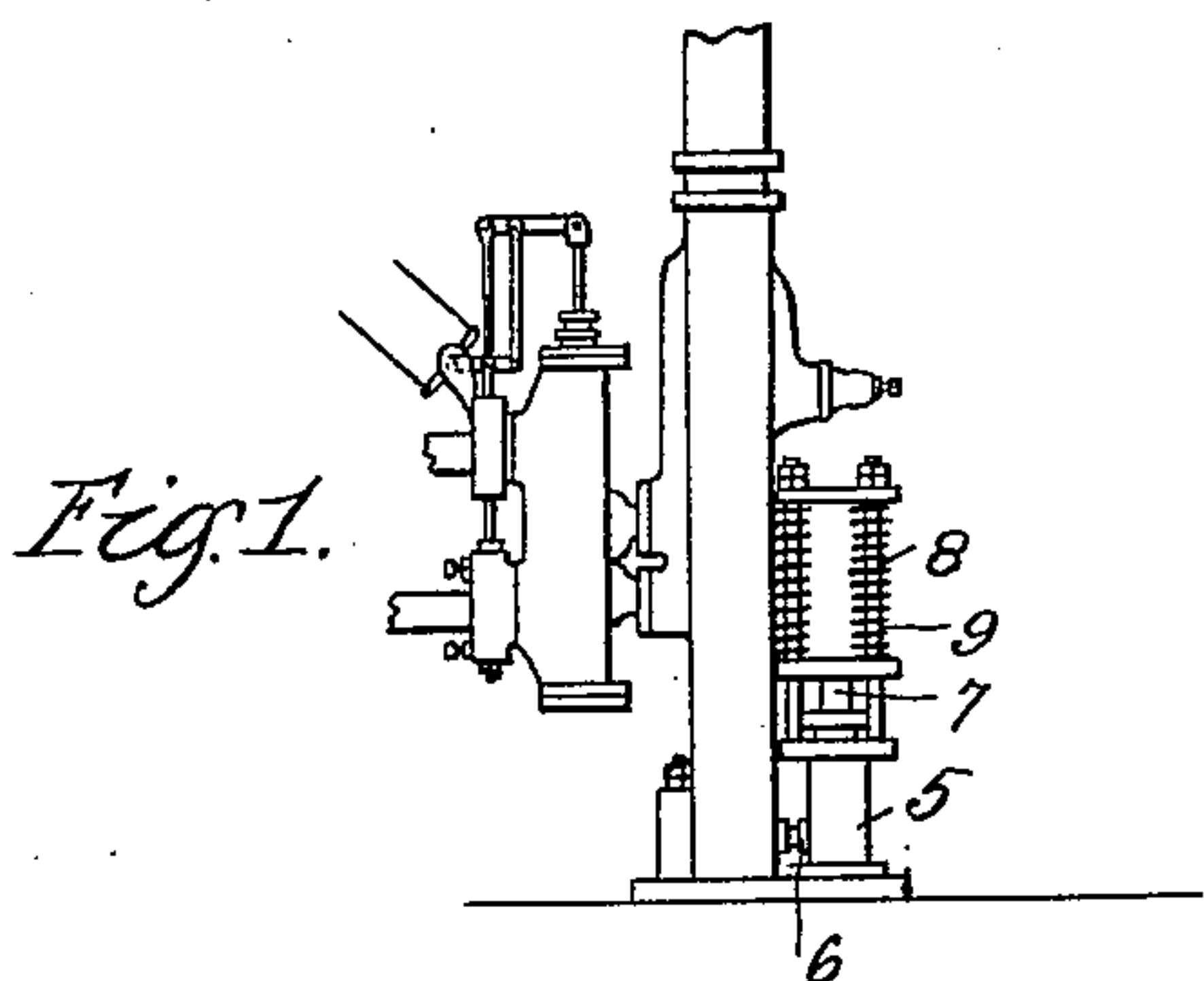
No. 640,589.

Patented Jan. 2, 1900.

G. H. REYNOLDS.
PLUNGER ELEVATOR ACCUMULATOR.

(Application filed Oct. 8, 1897.)

(No Model.)



Witnesses.
Wm. M. Rheems
J. Plumtree

Inventor
George H. Reynolds
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UNITED STATES PATENT OFFICE.

GEORGE H. REYNOLDS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CRANE ELEVATOR COMPANY, OF SAME PLACE.

PLUNGER-ELEVATOR ACCUMULATOR.

SPECIFICATION forming part of Letters Patent No. 640,589, dated January 2, 1900.

Original application filed April 30, 1897, Serial No. 634,547. Divided and this application filed October 8, 1897. Serial No. 654,523. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. REYNOLDS, a citizen of the United States, residing in Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Plunger-Elevator Accumulators, of which the following, taken in connection with the accompanying drawings, is a specification.

The subject-matter of this application was originally a part of an application filed by me April 30, 1897, Serial No. 634,547.

My invention has particular relation to that class of elevator in which a weighted ram or plunger is used to raise the car, the car being lowered by hydraulic pressure acting upon so as to raise said ram or plunger.

As the above type of elevator necessarily employs a plunger of considerable weight, it has been found that when traveling at a rapid speed downward sudden stoppage of such plunger produces more or less severe shock upon the car and violent strain upon the parts, the water being inelastic. It has been further found in the operation of elevators of the class referred to that when the plunger was traveling upward at a high rate of speed and the supply of motor-fluid to the cylinder was suddenly shut off there was a tendency to the creation of a partial vacuum beneath the plunger due to the great momentum of the same, and this vacuum permitted the plunger to settle down again a short distance and caused a severe lurch of the car.

To overcome the above difficulties, I provide in connection with the cylinder and communicating therewith a spring-accumulator constructed to yield more or less to the pressure within the cylinder, especially sudden increases thereof, and to cause the return of a slight amount of fluid to the cylinder after any sudden closure of the operating-valve, so as to prevent the formation of the vacuum referred to beneath the elevator-ram.

Referring now to the accompanying drawings, Figure 1 represents the lower end of an elevator-cylinder and its attached operating-valve with my improved accumulator connected to the cylinder. Fig. 2 shows the accumulator in section and on a larger scale. Fig. 3 is a top view thereof, and Fig. 4 is a plan section taken on the line 4 4 of Fig. 2.

The accumulator proper comprises a cylindrical casing 5, connected to the cylinder by a port 6, having within it a plunger 7, against the top of which are arranged three springs 8, placed so as to transmit their strain through the tie-rods 9 to the cylinder-casting 5. The plunger 7 when there is no pressure in the cylinder will be in the position shown in the drawings; but as the cylinder-pressure increases it will be raised thereby against the resistance of the springs 8, allowing some of the fluid from the cylinder to enter the casing 5 through the port 6. If the valve controlling the flow of fluid from the cylinder be suddenly closed, the momentum of the heavy plunger as it travels downward causes an increase of the pressure in the cylinder, and consequently an increase under the plunger 7, raising the same against the resistance of the springs 8, and thus preventing too violent or sudden stoppage of the car.

If the supply of fluid to the elevator-cylinder is suddenly cut off as the plunger is traveling upward, the momentum of its great weight causes a sudden reduction of the pressure within the casing 5, and the springs 8 being partially relieved of the pressure against them force the accumulator-plunger 7 downward, pressing some of the fluid back in the elevator-cylinder to avoid the formation of a vacuum within the latter and to prevent the lurching of the car, before referred to.

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

1. In a plunger-elevator, the combination with a main cylinder, of a casing communicating therewith, a plunger operating in said casing, a rod connected to said casing, and a spring interposed between said rod and plunger, and operating in opposition to the pressure in said main cylinder, as and for the purpose set forth.

2. In a plunger-elevator, the combination with the main cylinder, of a casing communicating at one end with said cylinder, a plunger operating in said casing and projecting from the other end thereof, rods connected to said casing, and springs interposed between said rods and the projecting end of said plunger, as and for the purpose set forth.

3. In a plunger-elevator, a main cylinder,
a casing communicating therewith, a plunger
operating in said casing, rods connected to
said casing, and springs arranged to bear at
5 one end against said rods and at the other end
against said plunger, the tension of said
springs being exerted in opposition to the

movement of said plunger due to increase in
pressure in the main cylinder, as and for the
purpose set forth.

GEORGE H. REYNOLDS.

Witnesses:

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