

(No Model.)

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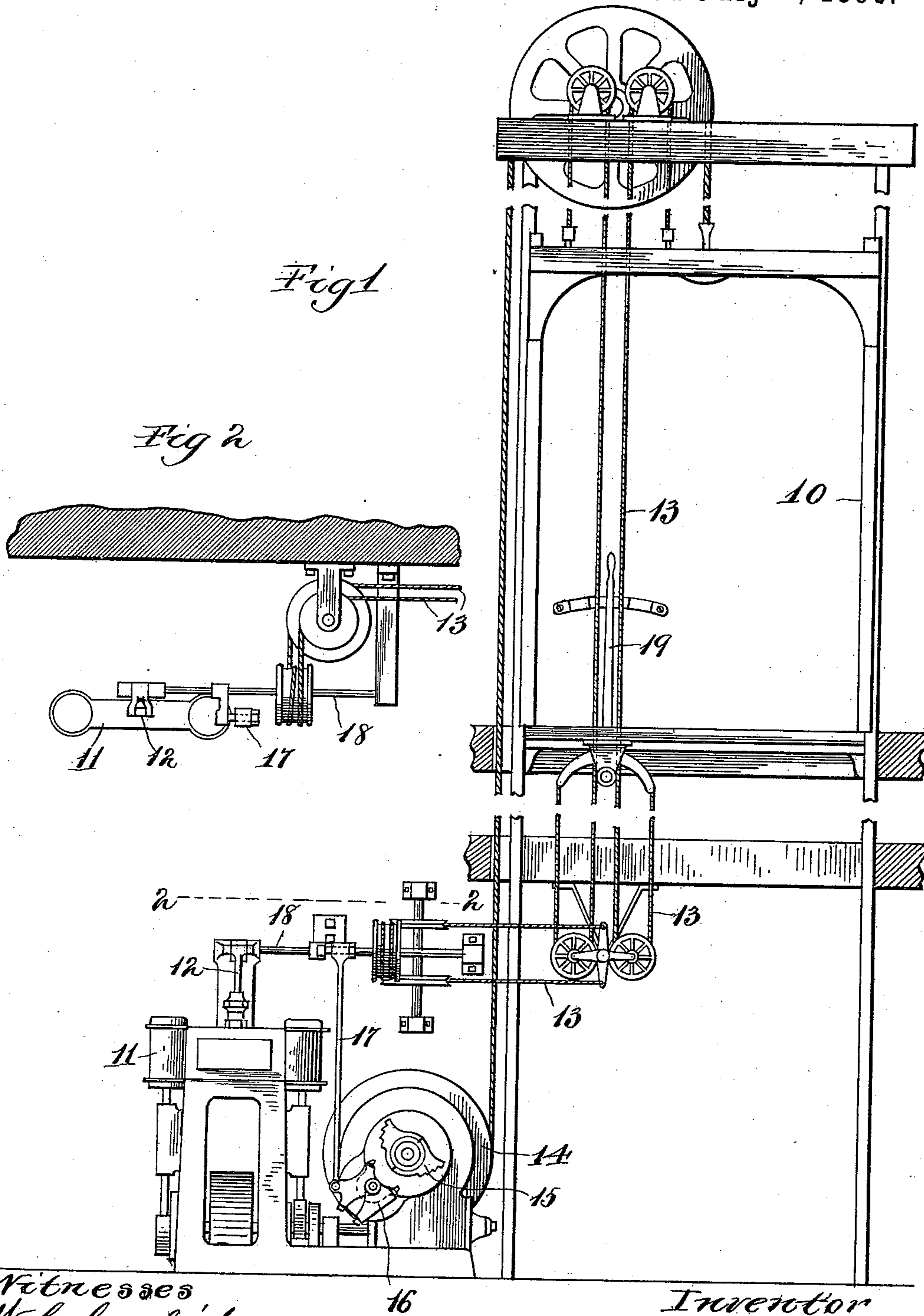
W. W. DOOLITTLE.  
ELEVATOR STOP.

No. 563,267.

Patented July 7, 1896.

*Fig 1*

*Fig 2*



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(No Model.)

3 Sheets—Sheet 2.

W. W. DOOLITTLE.  
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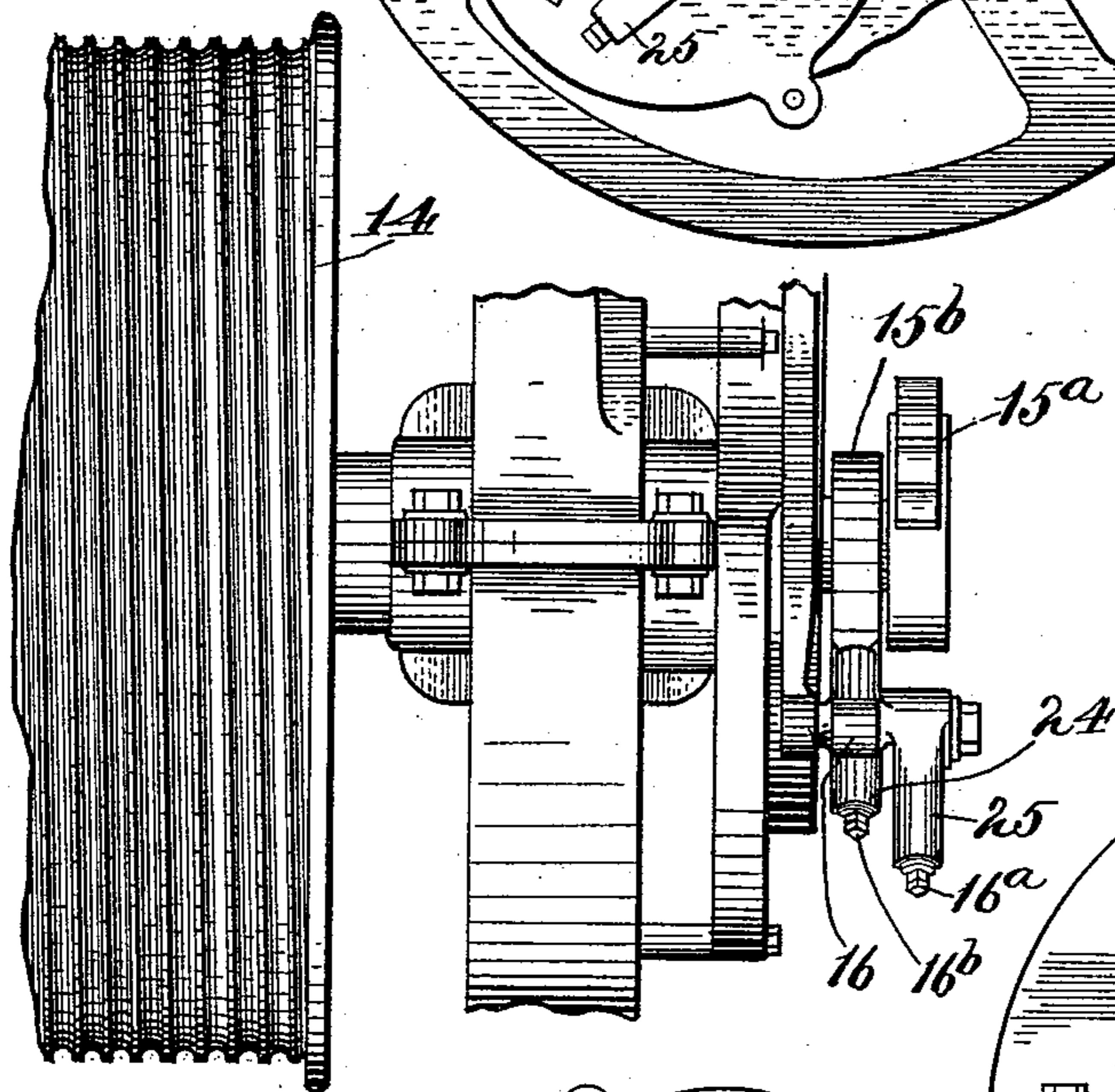
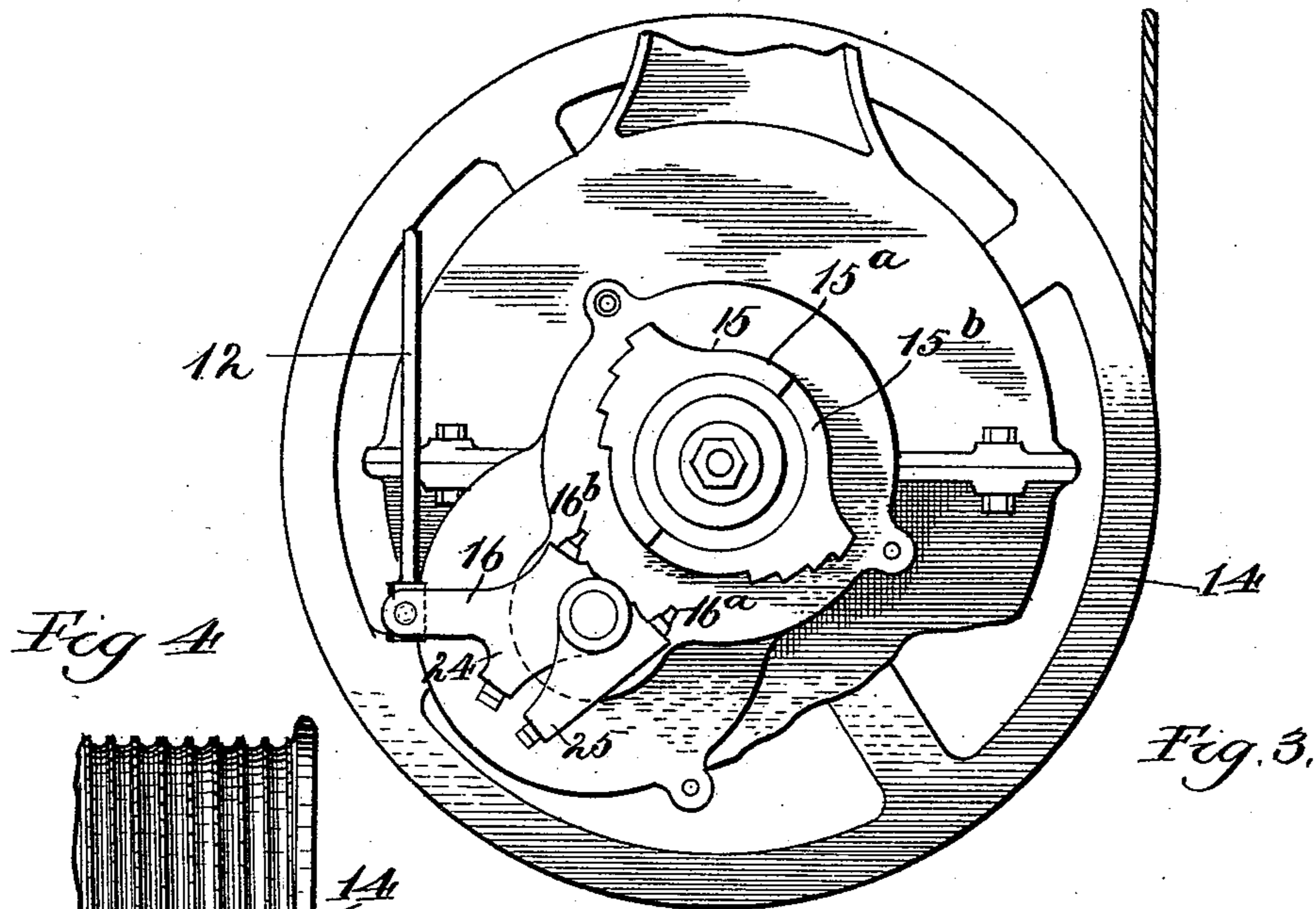


Fig. 5.

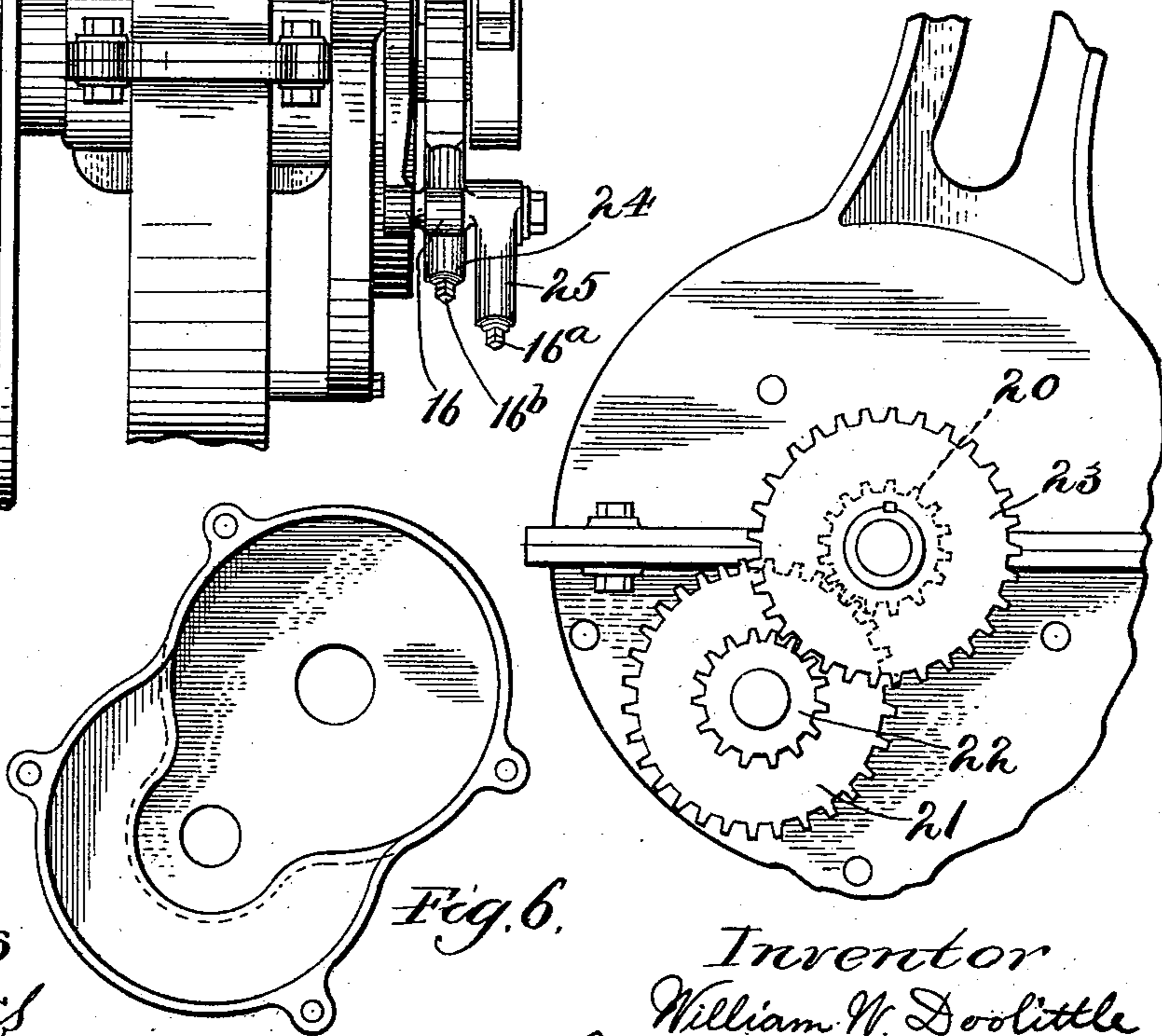


Fig. 6.

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3 Sheets—Sheet 3.

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Fig. 7.

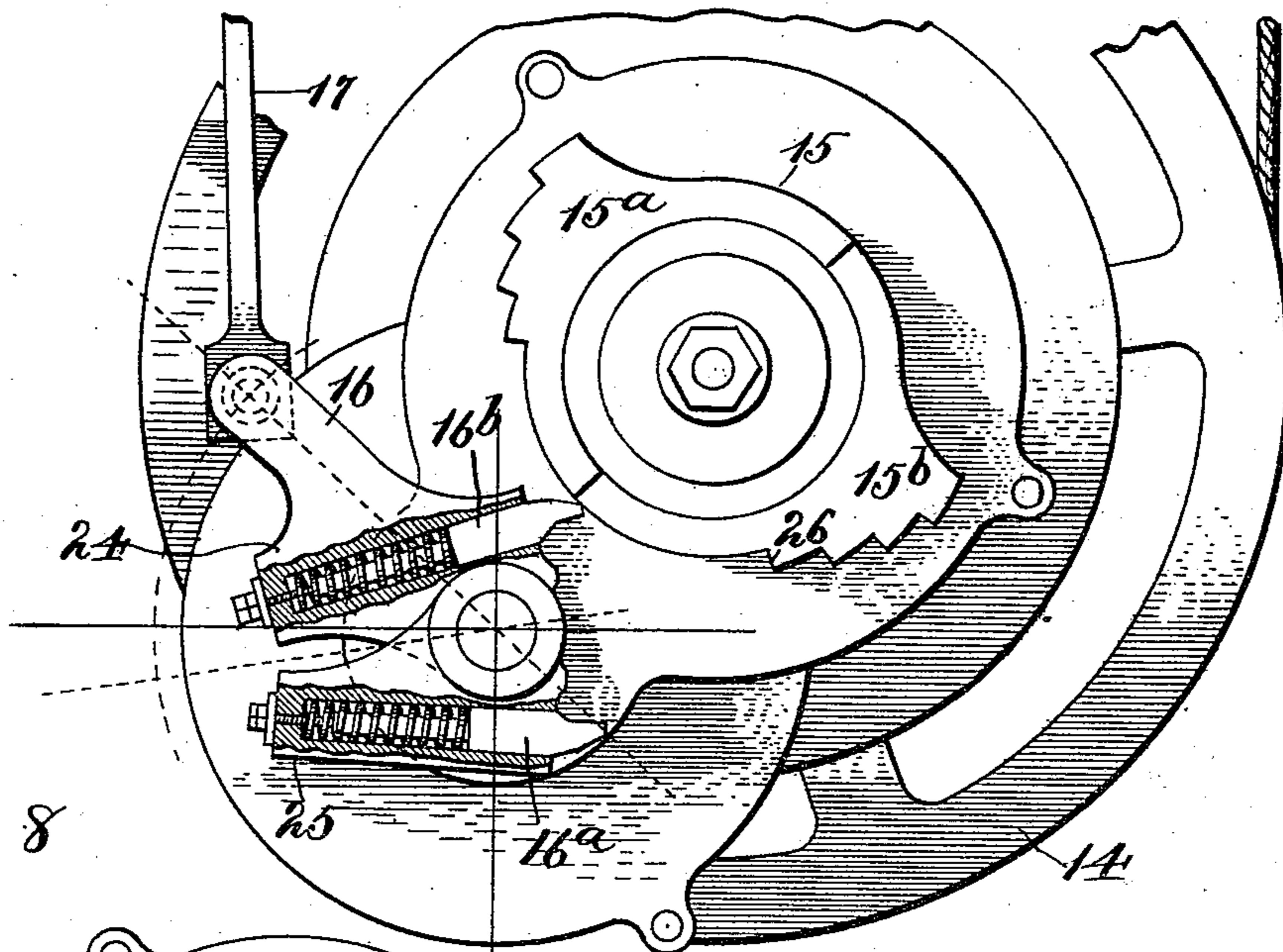


Fig. 8.

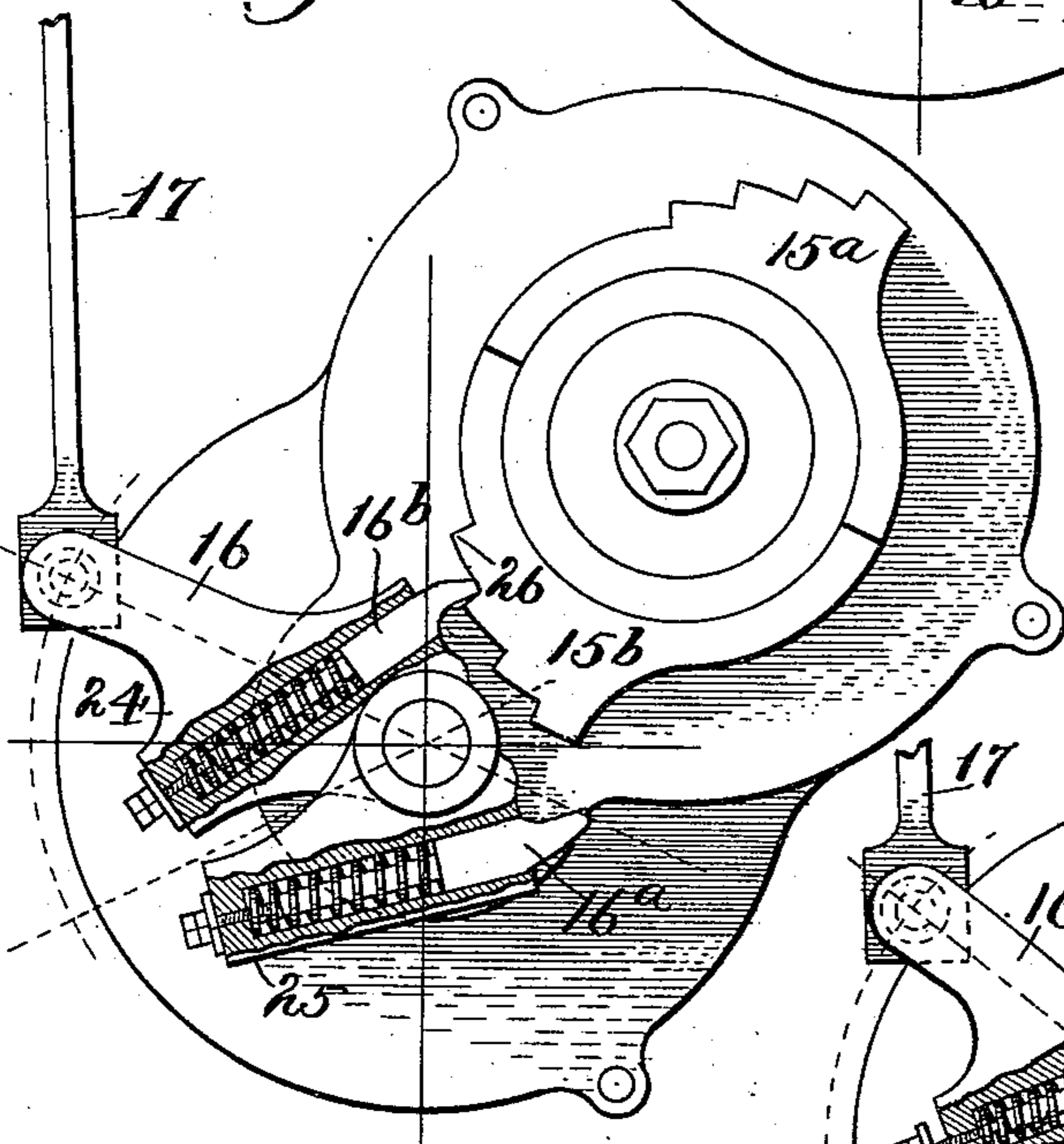
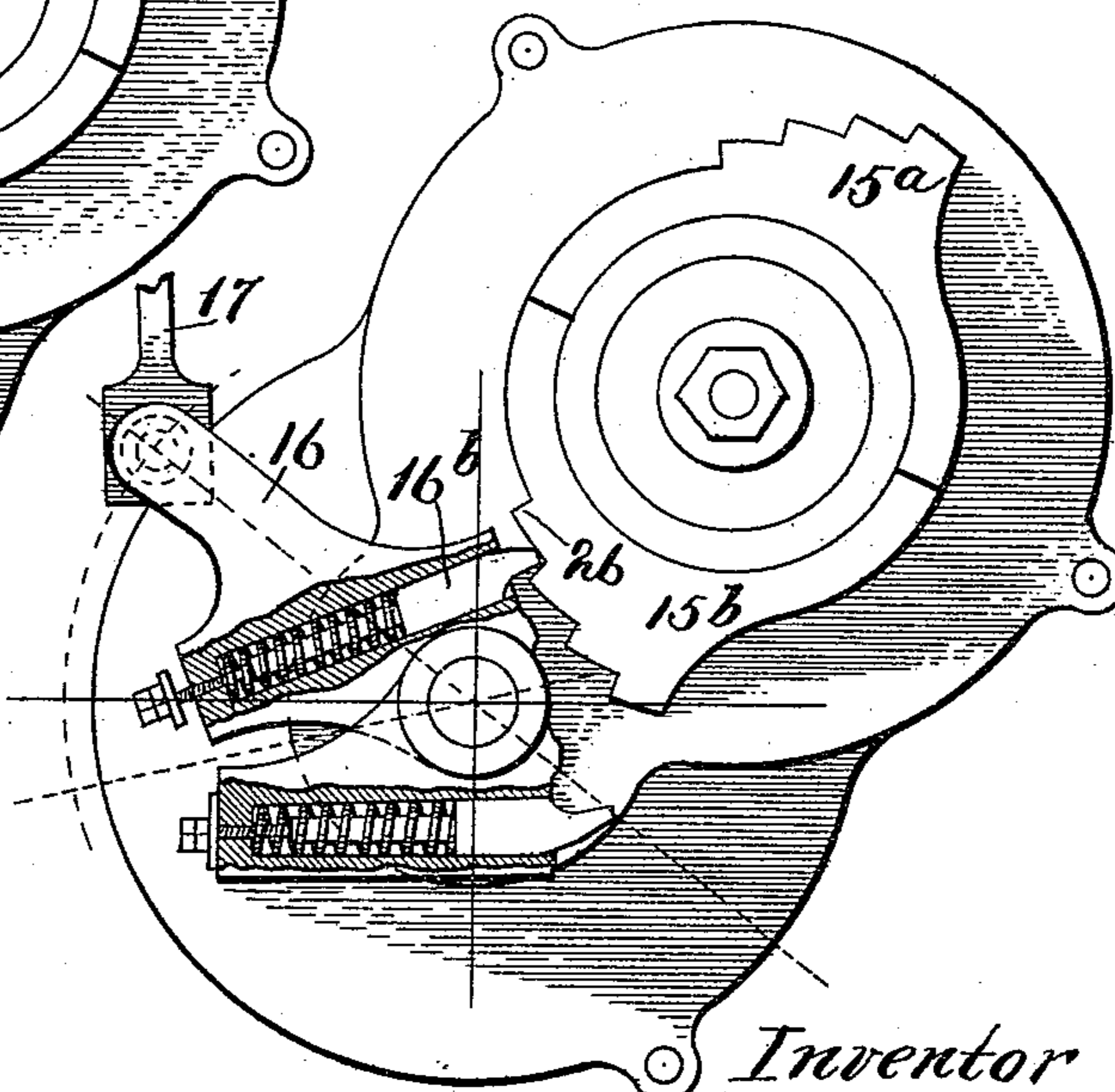


Fig. 9.



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# UNITED STATES PATENT OFFICE.

WILLIAM W. DOOLITTLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO RICHARD  
T. CRANE, OF SAME PLACE.

## ELEVATOR-STOP.

SPECIFICATION forming part of Letters Patent No. 563,267, dated July 7, 1896.

Application filed August 5, 1895. Serial No. 558,264. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. DOOLITTLE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevator-Stops, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of devices which are used in connection with lifting apparatus known as "elevators" or "hoists," for the purpose of automatically checking the speed of the car as it approaches either end of the well and stopping the car before it strikes.

It has been found in practice that none of the automatic stop devices in common use will permit the car to reach as high a point when heavily loaded as it will when empty, in consequence of which, if the stop mechanism be so adjusted that, with a light load, the car on its upward travel will stop just at the top floor; when a heavy load is being lifted, the gradual shutting off of the motive force, resulting from the action of the stop, makes it impossible to reach the level of the floor, besides causing the loss of a very appreciable amount of time in slowly getting up to the highest point possible. Conversely, if the stop mechanism be so adjusted that with a descending heavy load the car will not strike the bottom of the well; when it is coming down empty, or with only a light load, the reduced momentum will permit the stop to act before the car has reached the proper level, and will besides consume some time in settling down to the lowest point possible.

The object of my invention is the provision of an automatic stop, which, after it has operated to check the speed of the car, will, by mechanism to be hereinafter particularly described, permit of such additional movement of the controlling mechanism as will secure further movement of the car.

To the accomplishment of the above-mentioned objects my invention consists in the combination, with an elevator-car, and means for controlling its movement, of mechanism for automatically operating said controlling means which is so constructed as to permit the latter to be manipulated to move the car

farther in the same direction after such automatic operation has taken place.

To better understand my invention, reference may now be had to the accompanying drawings, in which—

Figure 1 shows in elevation an apparatus embodying my invention. Fig. 2 shows a partial plan view of the same. Fig. 3 is a side elevation of part of the hoisting mechanism drawn on a larger scale. Fig. 4 is a partial end elevation of the same. Fig. 5 shows a part of the frame of the engine with the cover which protects the gears which drive the rotating part of the stop removed. Fig. 6 is a detail view of the cover removed. Figs. 7, 8, and 9 represent three different positions of the stop mechanism.

Referring first to Figs. 1 and 2, 10 is an elevator-car. 11 is the hoisting-engine, having its valve-rod 12 operated by means of the controlling-cables 13. 14 is the hoisting-drum; 15, the revolving stop; 16, the main casting of the stop-lever; 17, the rod which connects the stop-lever with the rocker-shaft 18, which moves the engine-valve, and 19 is the hand-lever in the car. All these parts, except as to certain features in the lever 16, (to be hereinafter particularly described,) are old in the art, and being of well-known construction need no special mention here.

Referring now to Figs. 3 and 4, it will be seen that the stop 15 is divided in the middle into two halves 15<sup>a</sup> and 15<sup>b</sup>. These two halves are in planes at different distances from the drum 14 (see Fig. 4) in order that each may not interfere with the other's abutting lever or projection, as one is intended to operate when the car is at the top of the well and the other when the car is at the bottom of the well.

As it is of course necessary that the drum 14 revolve a number of times to raise the car from the bottom to the top of a high building, and as the stop 15 must not revolve more than once, or less, during such time, it is necessary that the motion of the latter be reduced. This I accomplish by the use of a set of spur-gears, (illustrated in Fig. 5,) in which the pinion 20 is fixed to the shaft of the drum, 21 meshes therewith, 22 is fast to 21, and 23 is the one to which the stop 15 is fastened.

The view given in Fig. 6 is a representation of the cover of the gears as it appears inverted.

I will now proceed to describe the operation of my invention, referring more particularly to Figs. 7, 8, and 9. In these figures it will be seen that the lever 16 has two cylindrical hollow arms 24 and 25, in which are arranged two spring projections 16<sup>a</sup> and 16<sup>b</sup>, adapted to engage with the stops 15<sup>a</sup> and 15<sup>b</sup>, respectively. Fig. 7 represents the position of the parts as the car is traveling upward, the projection 16<sup>b</sup> occupying such a position that it will engage the first step 26 of the stop 15<sup>b</sup> when the car nears the top of the well. In Fig. 8 the first step 26 has struck the projection 16<sup>b</sup> and moved the lever 16 and its connected rod 17 sufficiently far to check the speed of the car, the spring projection 16<sup>b</sup> being so constructed that it will not yield under lateral pressure from the step 26. If now the car be heavily loaded and is tardy in reaching the level of the upper floor, the operator on the car can move the lever and its connected controlling-cables to a position which will add to the motive force and bring the car to the point desired, this being permitted by the yielding of the spring projection 16<sup>b</sup> in the manner shown in Fig. 9.

In practice the stop 16 is made with a series of steps, so that the speed will be checked by degrees and not produce any jar on the apparatus, and my invention is so constructed that it can be brought into action after the impact of any of this series of steps, except in the case of the last one, which for safety sake is so arranged that it will completely stop the car regardless of any manipulation of the controlling mechanism by the operator.

As the operation of my invention when the car reaches the bottom of the well is simply a reversal of that which takes place at the top of the well, no detailed description of this will be necessary. 15<sup>a</sup> and 16<sup>a</sup> are the two parts which then coöperate to produce the desired results.

Throughout this specification, as well as in

the annexed drawings, I have purposely omitted all immaterial details for the sake of brevity and clearness; but I do not desire to be understood as limiting myself to the precise construction shown and described, but would include all equivalent means known in the art.

I am aware that a construction has been heretofore proposed embodying the combination, in an elevator apparatus, with the motor-control device and automatic stop devices, of connections intermediate of the motor-control device and the automatic stop devices constructed to permit a movement of the motor-control device independent of the automatic stop devices; but the construction referred to, involving, as it does, a purpose, form, and operation differing from my invention, I hereby disclaim.

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

1. The combination of an elevator-car, means for controlling its movement, and mechanism for automatically operating said controlling means as the car approaches either limit of its travel, said mechanism being so constructed as to permit the controlling means to be manipulated to move the car farther in the same direction after such automatic operation of said controlling means has taken place, substantially as described.

2. In an elevator apparatus, the combination of a car, a hoisting-drum, a stop connected with the shaft of the hoisting-drum, and yielding projections 16<sup>a</sup> and 16<sup>b</sup> connected with the valve of the hoisting-engine; one adapted to be operated by said stop as the car approaches the limit of its travel in one direction, and the other adapted to be operated as the car approaches the limit of its travel in the other direction, substantially as described.

WILLIAM W. DOOLITTLE.

Witnesses:

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