(No Model.)

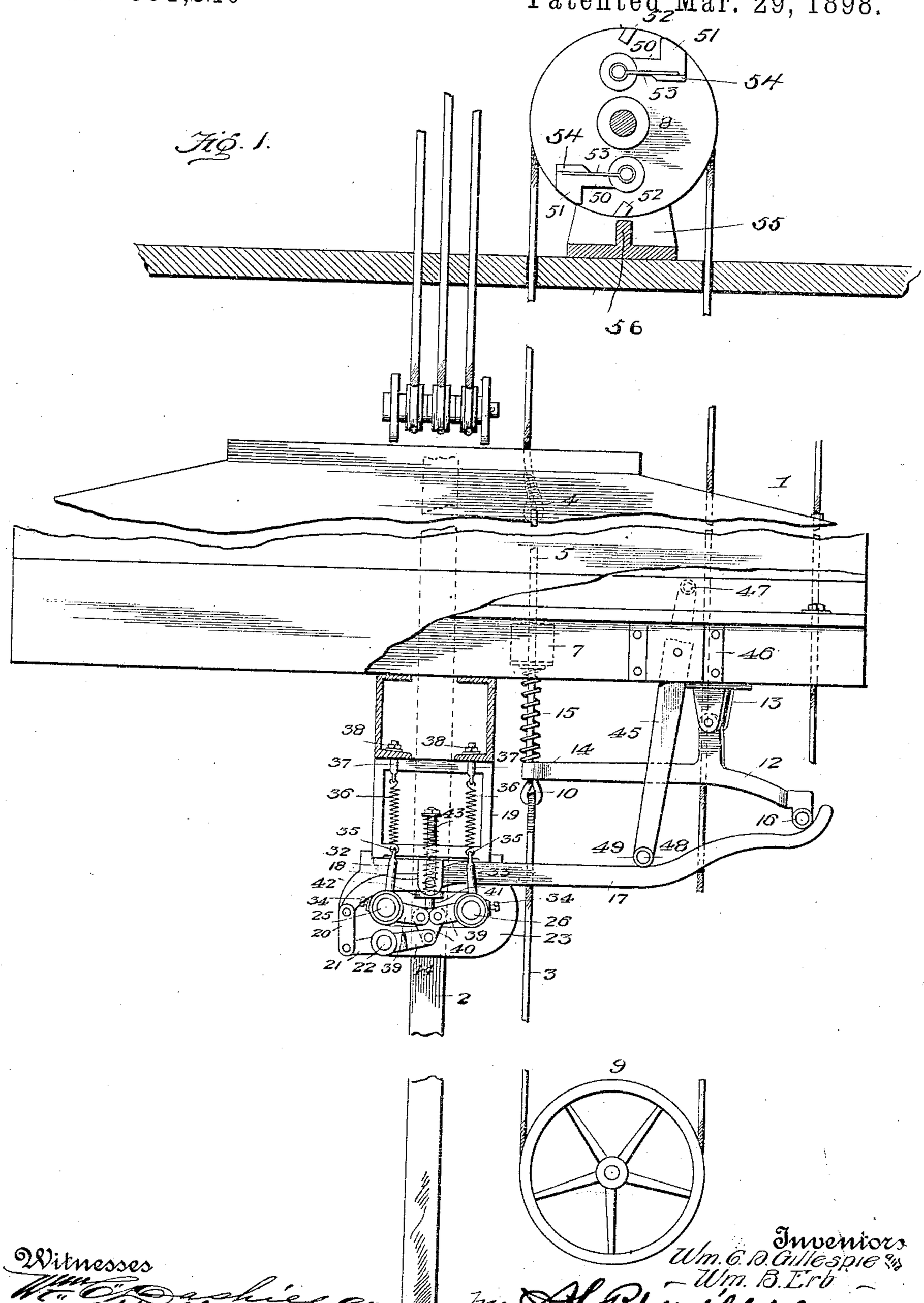
4 Sheets—Sheet 1.

W. C. D. GILLESPIE & W. B. ERB.

AUTOMATIC AND EMERGENCY ELEVATOR CAR SAFETY BRAKE.

No. 601,340 Patented Mar. 29, 1898.

Fig. 1.



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(No Model.)

4 Sheets—Sheet 2.

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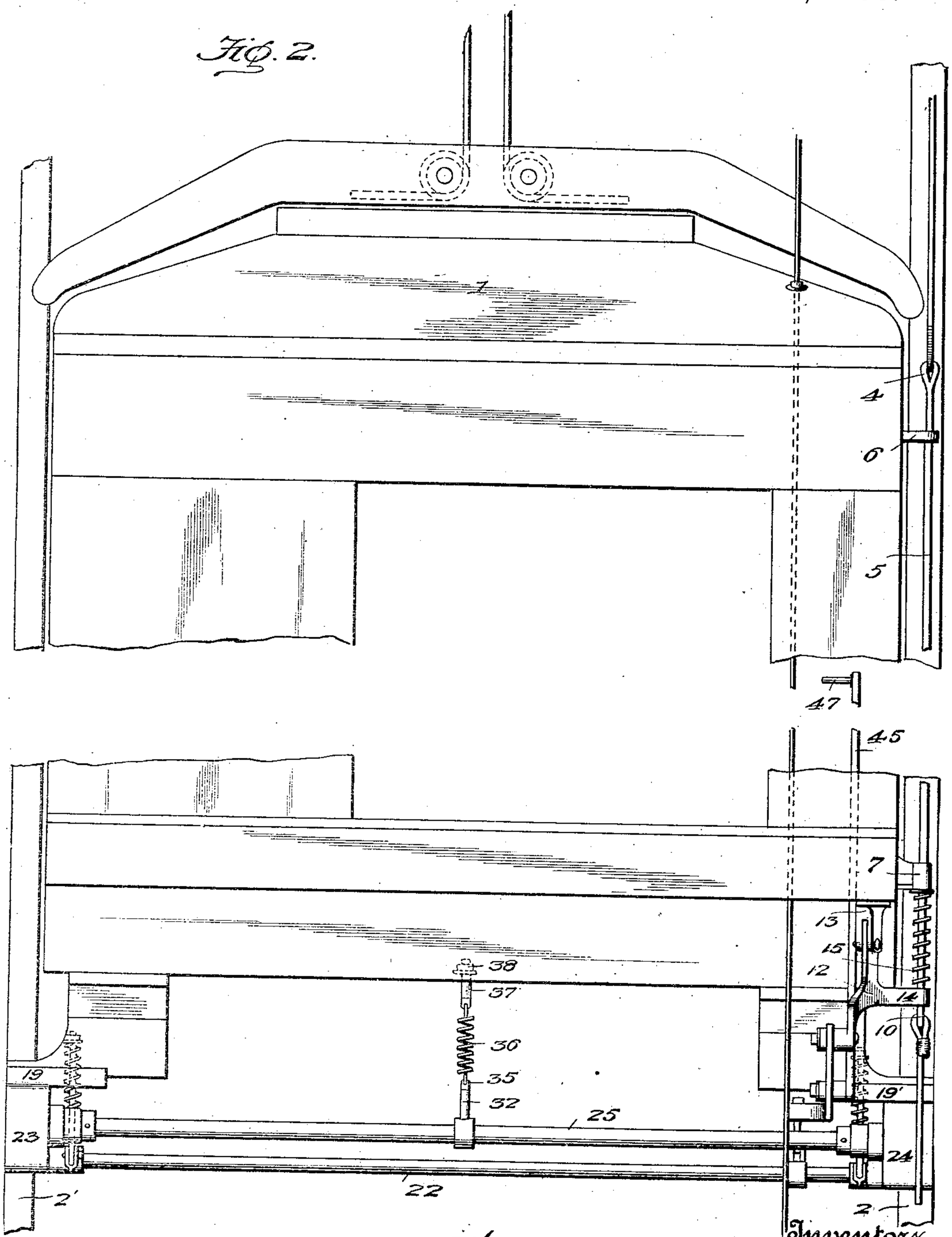
AUTOMATIC AND EMERGENCY ELEVATOR CAR SAFETY BRAKE.

No. 601,340. Patented Mar. 29, 1898.

Fig. 2.



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(No Model.) 4 Sheets—Sheet 3.

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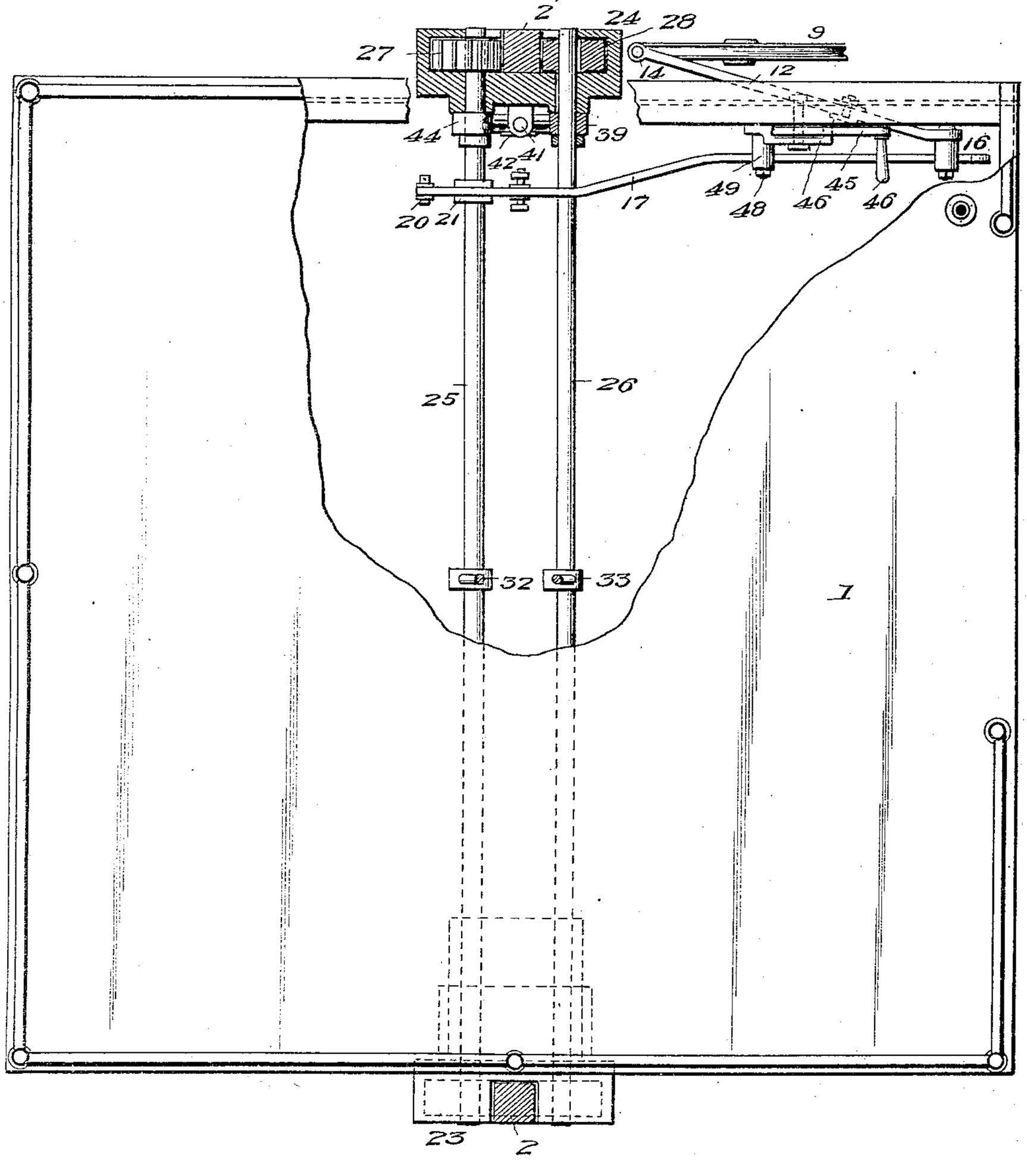
AUTOMATIC AND EMERGENCY ELEVATOR CAR SAFETY BRAKE.

No. 601,340. Patented Mar. 29, 1898.

Fig. 3.



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4 Sheets—Sheet 4.

W. C. D. GILLESPIE & W. B. ERB.

AUTOMATIC AND EMERGENCY ELEVATOR CAR SAFETY BRAKE.

No. 601,340. Patented Mar. 29, 1898.

Fig. 4

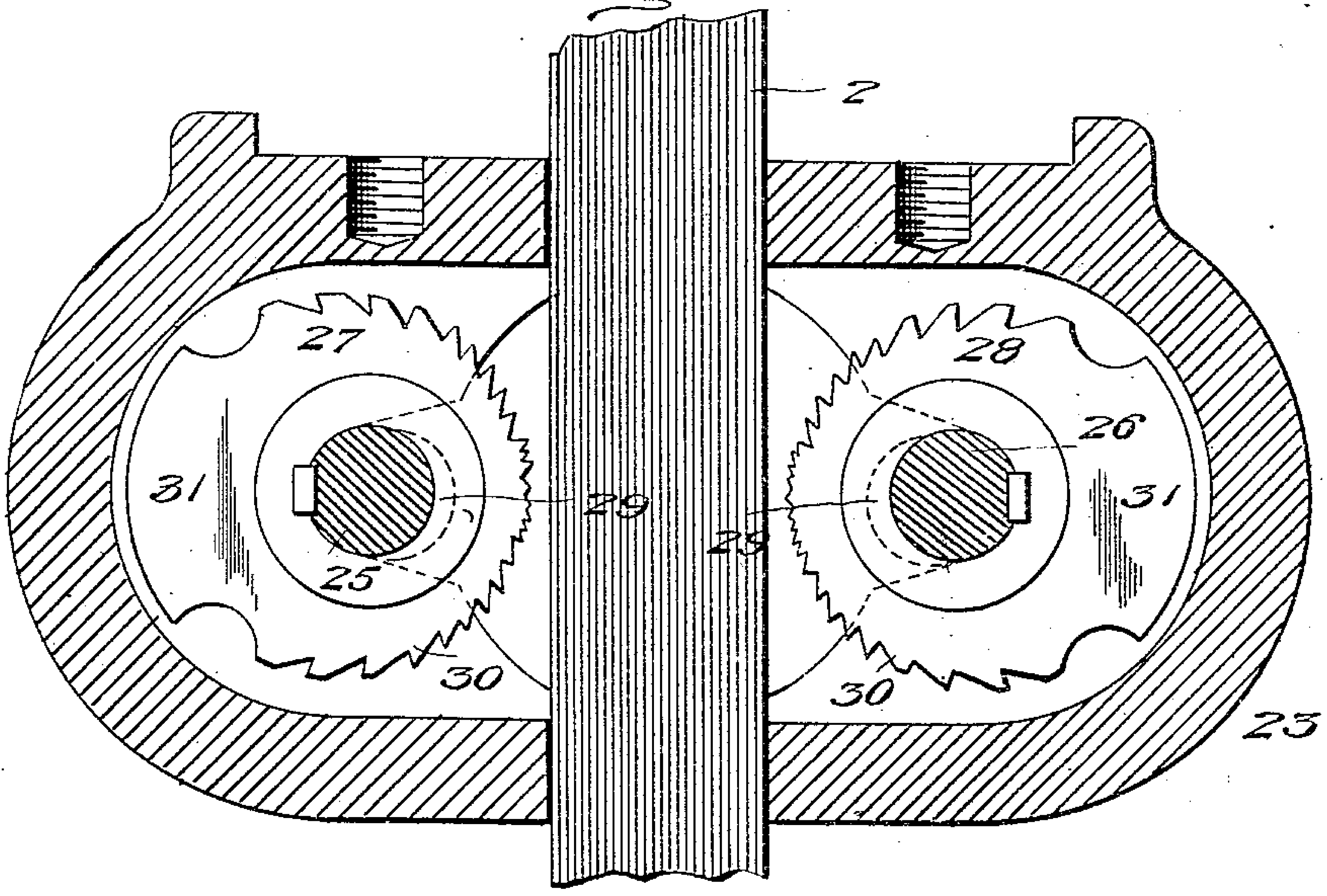
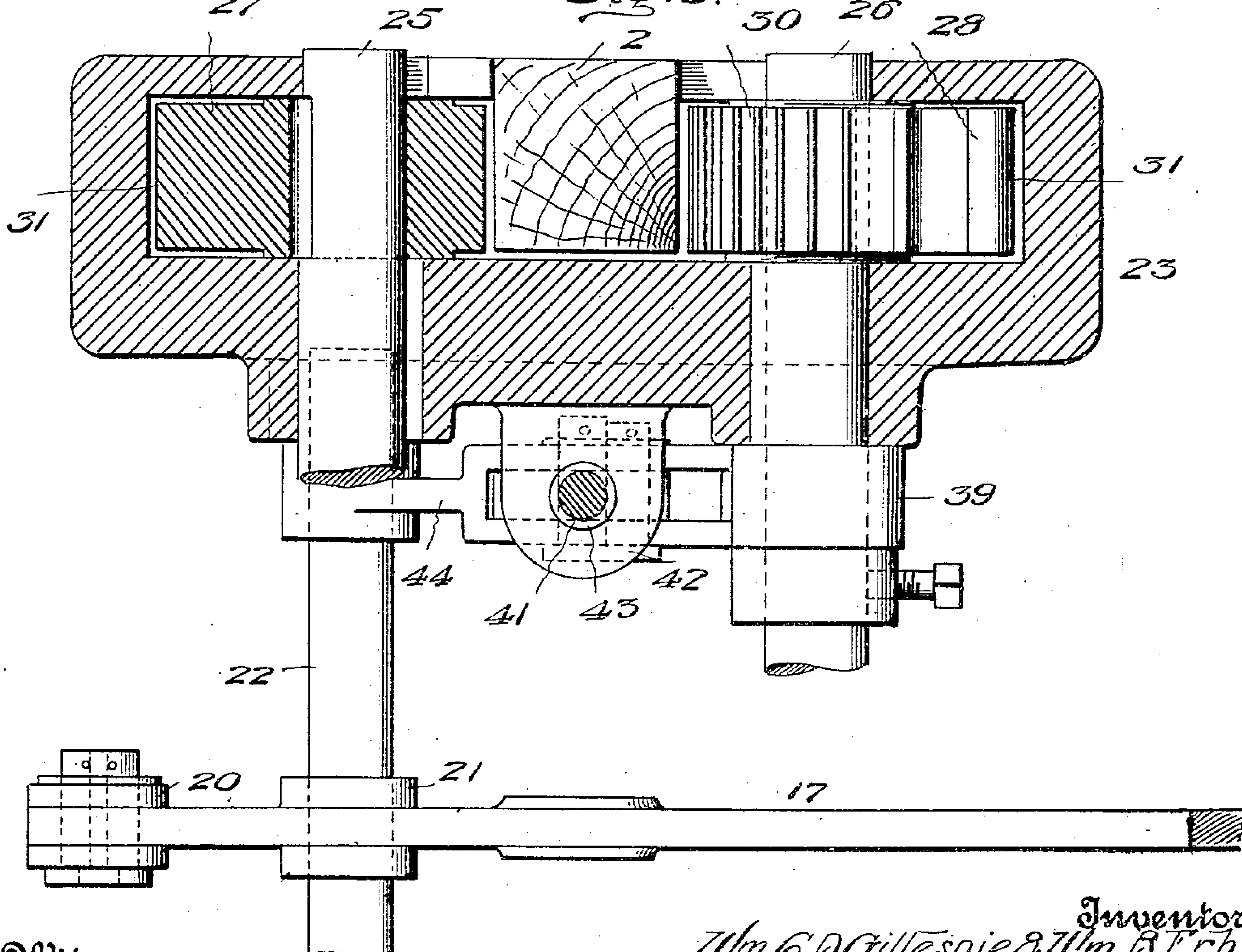


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM C. D. GILLESPIE AND WILLIAM B. ERB, OF CHICAGO, ILLINOIS.

AUTOMATIC AND EMERGENCY ELEVATOR-CAR SAFETY-BRAKE.

SPECIFICATION forming part of Letters Patent No. 601,340, dated March 29, 1898.

Application filed May 20, 1897. Serial No. 637,423. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM C. D. GILLESPIE and WILLIAM B. ERB, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic and Emergency Elevator-Car Safety-Brakes; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention has relation to automatic and emergency hand-brakes for elevator-cars; and the object is to provide a simple, reliable, and effective safety-brake for passenger elevator-cars that will act automatically or in an emergency may be operated by hand.

To these ends the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same reference characters indicate the same parts of the invention.

Figure 1 is a side elevation of a passenger elevator-car with our improved automatic safety-brake in position. Fig. 2 is a front elevation of the same. Fig. 3 is a plan view. Fig. 4 is a vertical section of the brake-cams, and Fig. 5 is a horizontal section of the same.

1 represents the car, and 2 2′ the guide-rails.

3 represents the governor-rope, the upper end of which is fixed to an eye 4 on the upper end of a rod 5, mounted in guide-brackets 6 and 7, fixed to the side of the car.

The governor-rope 3 extends upward, passing around a groove in the periphery of the governor-wheel 8, thence downward and around a grooved guide-pulley 9, and thence upward, where its end is fixed to the eye 10 on the lower end of the rod 5. 12 represents a lever fulcrumed in the bracket 13, fixed to the bottom of the car, and one end 14 of said lever loosely encompasses the lower end of said rod just above the eye 10, and 15 represents a spiral spring encompassing said rod, with its lower end resting on said lever and its upper end in contact with the guide-bracket 7. The opposite or outer end of said lever 12 is provided with a friction-roller 16, which rests upon the outer end of the longer arm of a brake-lever 17, fulcrumed in a depending arm 18 of a bracket 19, secured to the bottom of the car. The shorter arm of this lever 17 is pivoted to the upper end of a link 20, the lower end of which is pivoted to a lever 21, fixed on a transverse rod 22, the outer ends of which are journaled in the boxes 23 24, secured to the brackets 19 19′, fixed to the bottom of the car.

25 and 26 represent parallel horizontal shafts the outer ends of which are also journaled in said boxes, extending inwardly on each side of the guide-rails 2 2′.

27 28 represent the brake-cams, which are fixed to the contiguous ends of said shafts 25 26, one on each side of the guide-rails. The orifices 29 in said boxes 23 and 24, which form the bearings for the ends of the shafts 25 26, are slightly oblong, as shown in the dotted lines in Fig. 4, to permit the ends of the shafts to approach the guide-rail and facilitate the engagement of the cams. The face of each of these cams is provided with a series of transverse teeth 30 30, which are adapted to engage the parallel sides of the guide-rails and support the weight of the car.

31 represents a radial lug or jaw on each cam, and it is of greater radius than the "throw" of the cam to prevent the possibility of the cams turning too far.

32 33 represent crank-arms fixed about midway of the shafts 25 26 by the set-screws 34 34, and their outer ends are formed with eyes 35, to which are secured the lower ends of the spiral springs 36 36, the upper ends of which are secured to the bolts 37 37, adjustably secured to the bottom of the car by nuts 38 38. When the springs 36 36 are in the position shown in Fig. 1 with reference to their crank-arms 32 33, the cams 25 26 are in the position shown in Fig. 4 with reference to the guide-rail, so that the cams will be held clear of the rail, and should the cams be thrown into operation to engage the rail the springs will give in either direction to allow the upper or lower eccentric faces of the cams to bind on the rail, and when said cams are released the said springs will restore them to their normal position.

39 39 represent crank-arms fixed on each end of the shafts 25 26, and their inwardly-

projecting ends are pivoted to a V-shaped plate 40, formed with an integral stud 41, having a vertical bearing in the ear 42, formed on the inner side of the boxes 23 24, and 43 represents a spiral spring encompassing said stud, its lower end resting on the upper face of the ear and its upper end fixed in the stud, the tension of said spring being exerted to hold the cams out of contact with the guide-rails.

44 44 represent crank-arms fixed on each end of the rod 22, their outer ends pivoted to the lower ends of the V-shaped plates 40 40, so that when the rod 22 is operated through the medium of the lever 12 said crank-arms 44 44 will draw the V-shaped plates 40 downward and operate the shafts 25 26 to throw the cams 27 and 28 into engagement with the guide-rails and stop the car.

45 represents a hand-lever fulcrumed on a bracket 46 on the bottom of the car, its longer arm extending upwardly inside of the car, where it is provided with a hand-grip 47 for conveniently operating the same. The lower arm of said lever is provided with a lateral stud 48, and on which is mounted a roller-sleeve 49, which engages the upper edge of the brake-lever 17, and by throwing the upper end of said lever backward the lower arm rides over the curved face 49 of the brake-lever to depress the same and apply the brake.

The governor-wheel 8 is mounted on a suitable shaft journaled in the fixed bracket 55, and 50 50 represent pawls pivoted to one side of said wheel, and they are each provided with a retractile spring 53, which normally retains them against the lugs 54 54 in the position shown in Fig. 1.

52 52 represent lugs formed integral with the wheel, and they project into the path of the forward movement of said pawls to limit said movement. The outer end of each of said pawls terminates in a detent 51, which engages the transverse bar 56 of the bracket 55 to arrest the motion of the governor-wheel during the descent of the car whenever sufficient speed is imparted to it to cause the centrifugal force to overcome the tension of the springs 53 and project the arms outwardly to engage the fixed bar 56.

The operation of the safety-brake is as follows: The springs 53 of the governor-wheel are set at such a point as to hold the arms 50 against the lugs 54 when the car is traveling at its regulated speed. Should the elevator-rope part or the car attain an unusual speed, the arms 50 are thrown outward by centrifugal force, due to the increased speed of the governor-wheel, and one or the other of the pawls 51 engages the bar 56 and stops the governor-wheel. This action retards the motion of the governor-rope, and consequently the rod 5, compressing the spring 15 and drawing the inner end 14 of the lever 12 upward, throwing its free end downward, which in turn depresses the outer end of the brake-lever 17, which, through the medium of the bar 20 and lever 21, rocks the rod 22, and it in turn turns the shafts 25 and 26 to project the toothed faces of the cams into engagement with the parallel sides of the guide-rails to stop the car.

If from any cause it becomes necessary to apply the brake-cams in an emergency from the inside of the car, the lever 45 is thrown backward, which causes its lower end to ride forward on the outer end of the brake-lever 17, depress it, and apply the brake, as in the first instance.

Although we have specifically described the construction and relative arrangement of the several elements of our invention, we do not desire to be confined to the same, as such changes or modifications may be made as clearly fall within the scope of our invention without departing from the spirit thereof.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

An automatic safety-brake for elevator-cars, comprising the car, the rod 5 carried thereby, the governor-rope 3, connected to the upper and lower ends of said rod, a governor-wheel around which said rope passes and driven thereby, the lever 12 fulcrumed on the bottom of said car and having one end loosely encompassing said rod, the spiral spring 15 located on said rod between the lever and the bottom of the car, in combination with the boxes 23 24 fixed to said car, the parallel horizontal shafts 25 26, having their outer ends journaled in said boxes, the brake-cams 27 28, fixed on said shafts, the crank-arms 32 33 fixed to said shafts and provided with the springs 36, fixed at their upper ends to the bottom of the car, the crank-arms 39 39, fixed to said shafts, the V-shaped plates 40 pivoted to said arms 39 and provided with guide-studs 41, mounted in the ears 42 and the springs 43, encompassing said studs, the lever 17, fulcrumed on the bracket-arm 18, the transverse rod 22, the lever 21 fixed to said rod, crank-arms 44 also fixed to said rod, and having their outer ends pivoted to the lower ends of said plates 40, and the link 20, connecting said lever 21 with the shorter arm of the lever 17, substantially as shown and described.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

WM. C. D. GILLESPIE.
WM. B. ERB.

Witnesses:
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M. A. DEVINE, Jr.