

(No Model.)

3 Sheets—Sheet 1

D. TORREY.

CAR BRAKE.

No. 287,889.

Patented Nov. 6, 1883.

Fig 1.

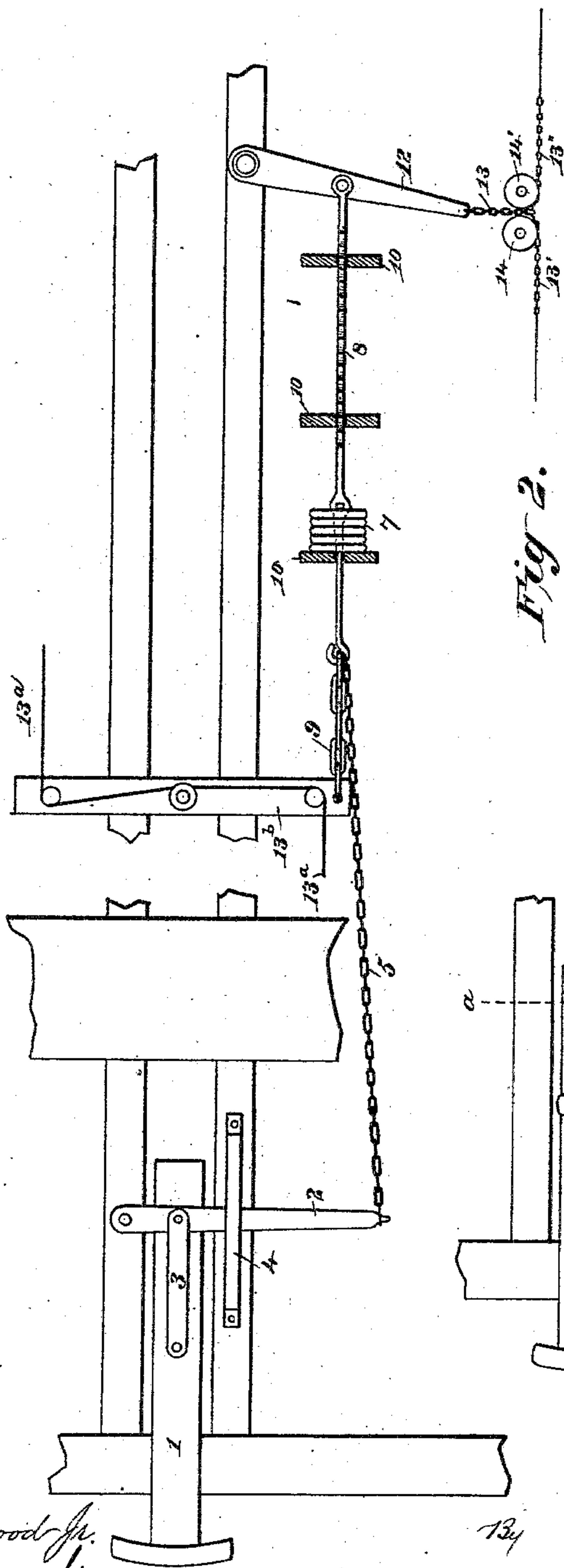


Fig 2.

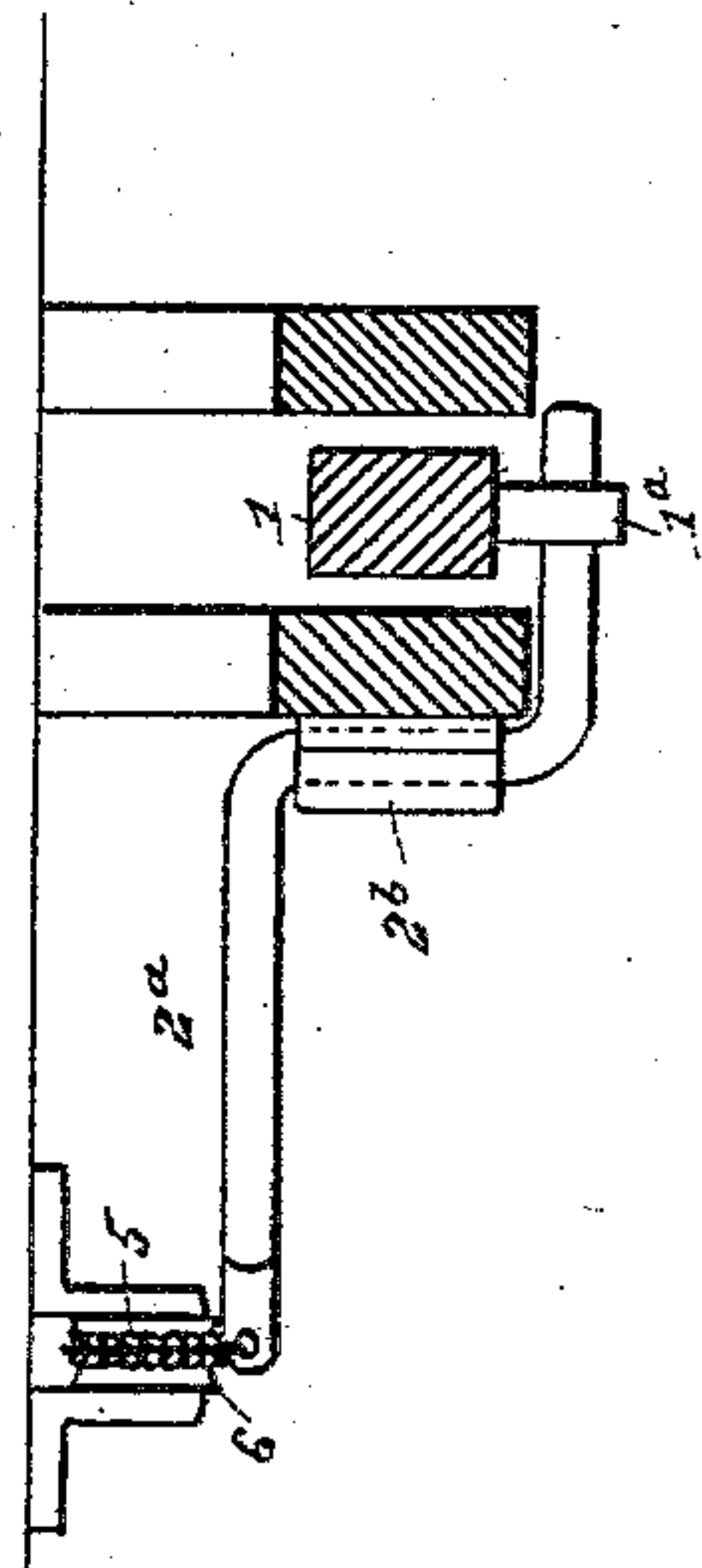
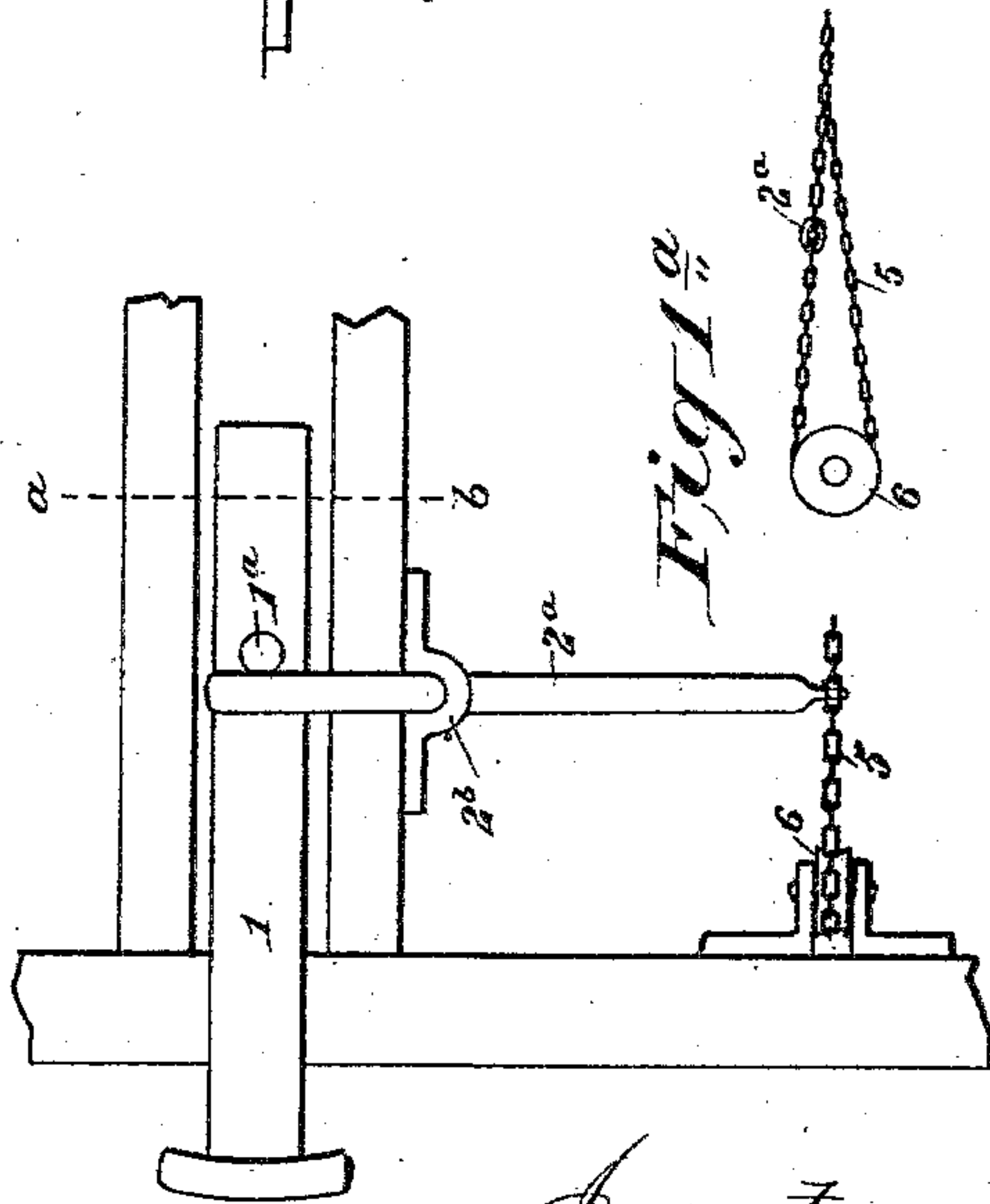


Fig 1<sup>a</sup>



Attest

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(No Model.)

3 Sheets—Sheet 2.

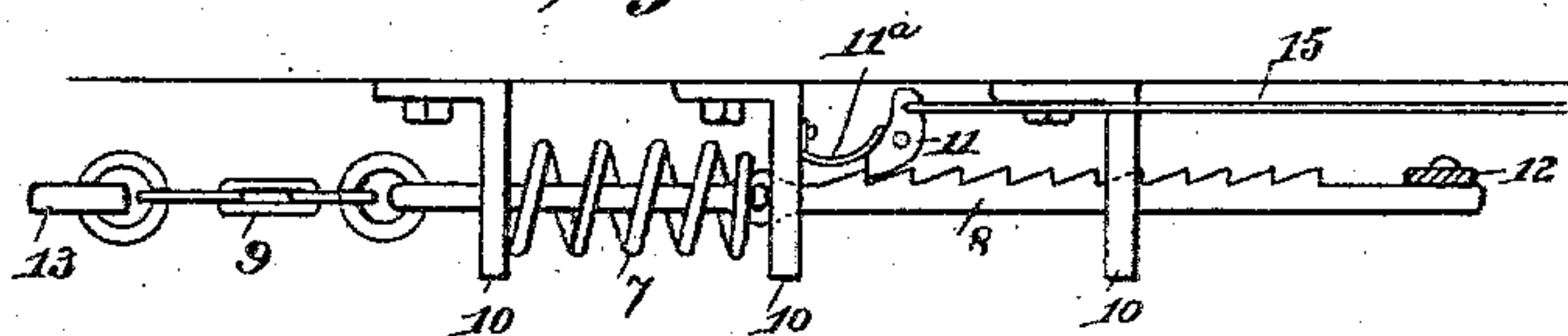
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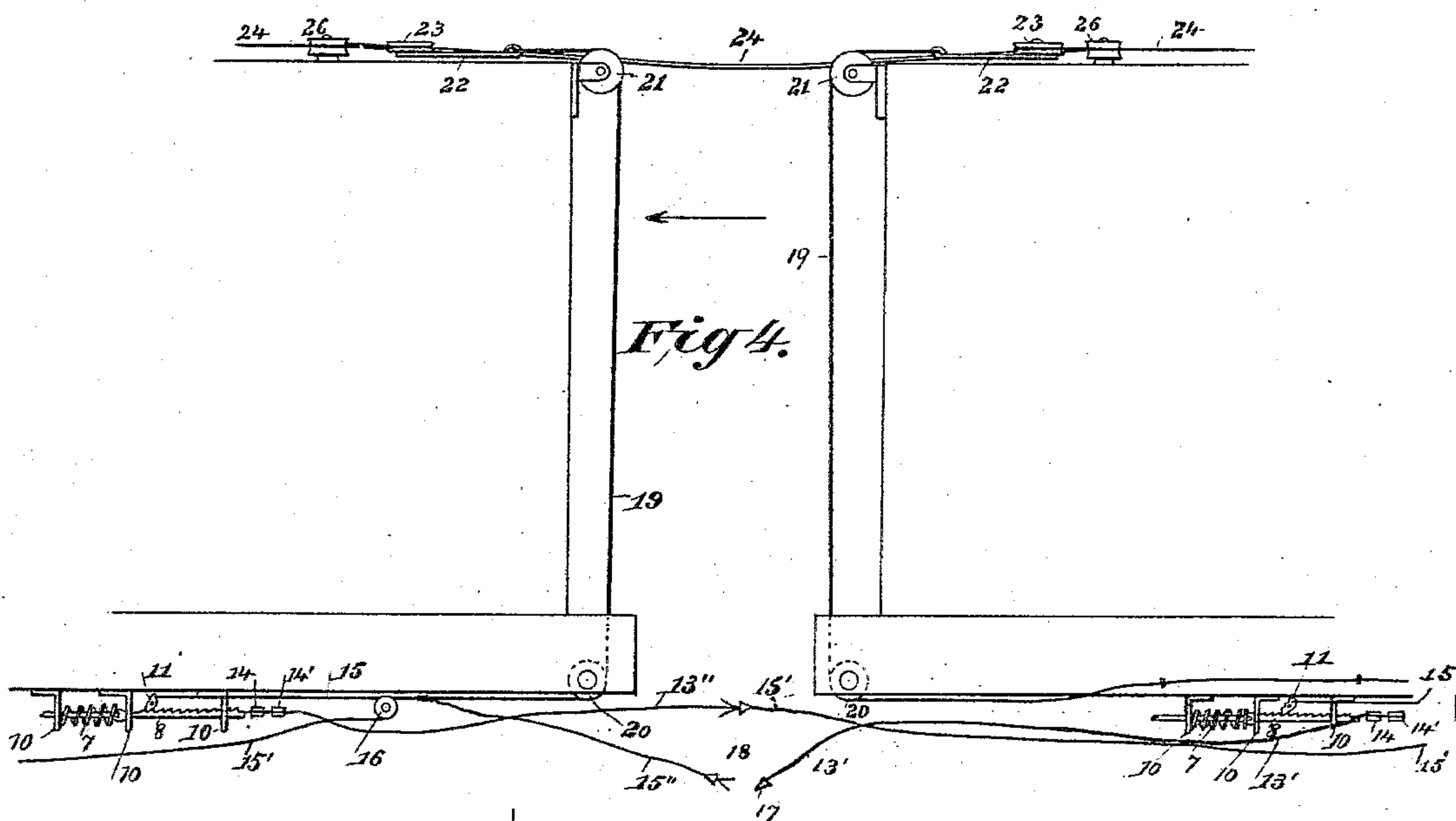
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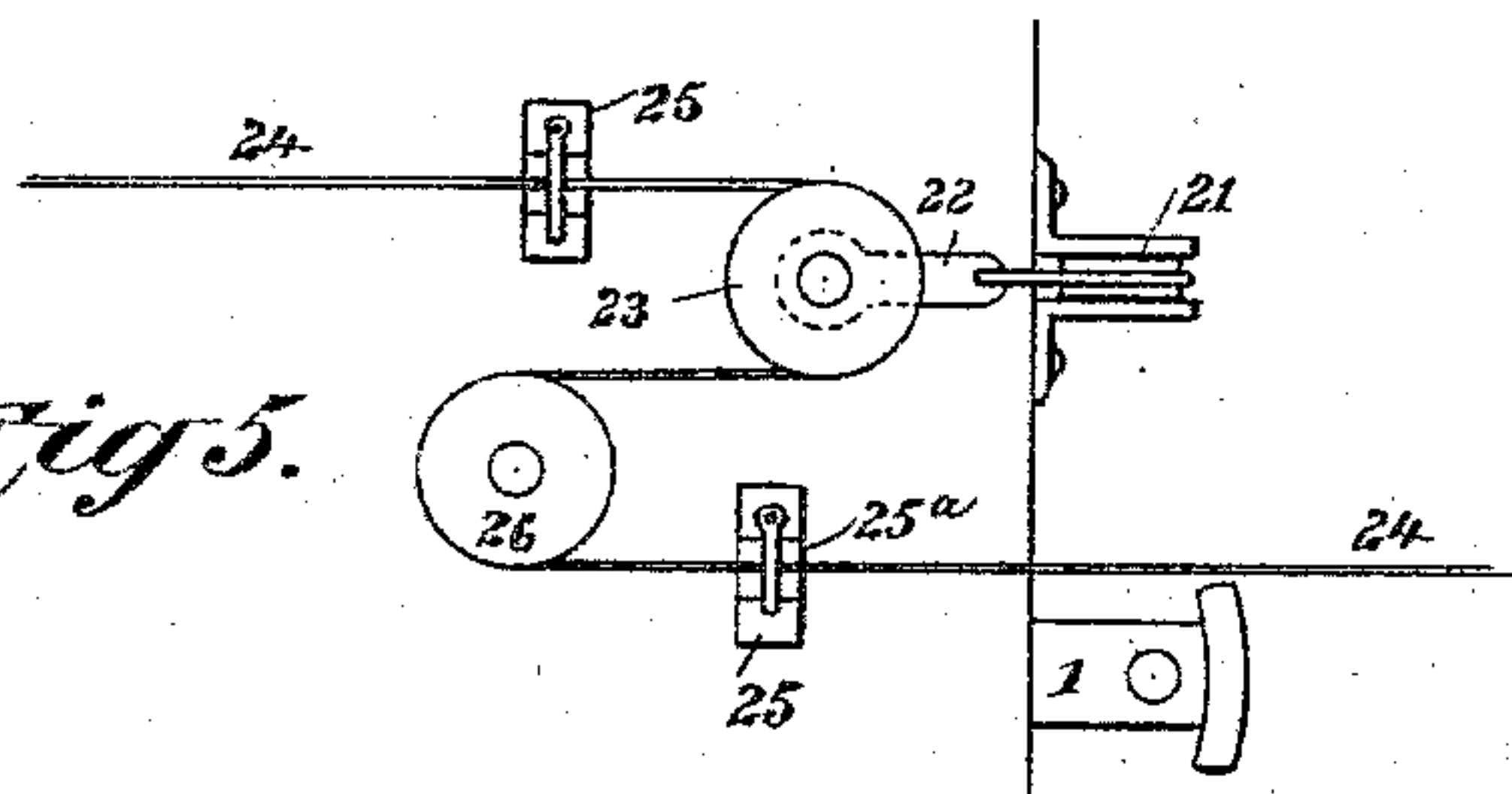
*Fig 3.*



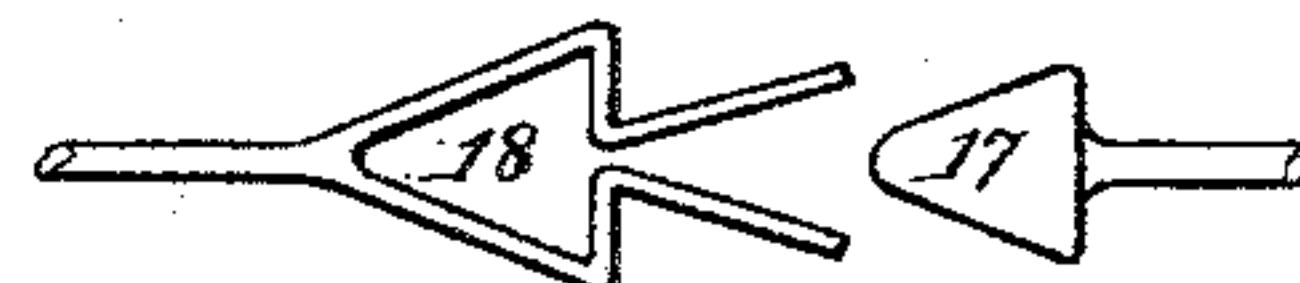
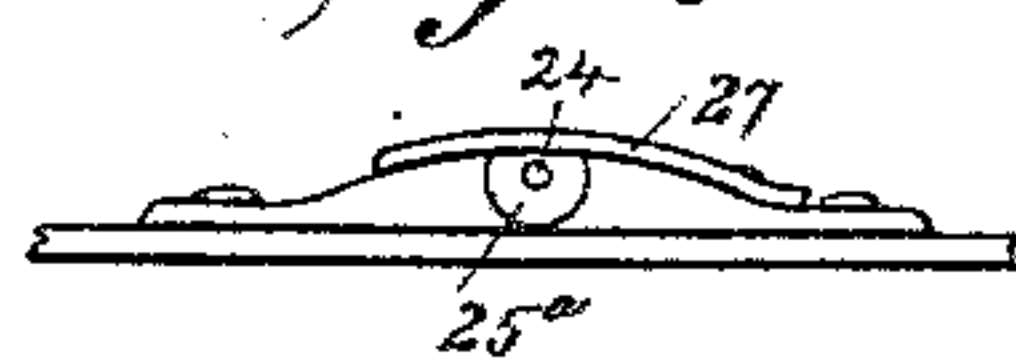
*Fig 4.*



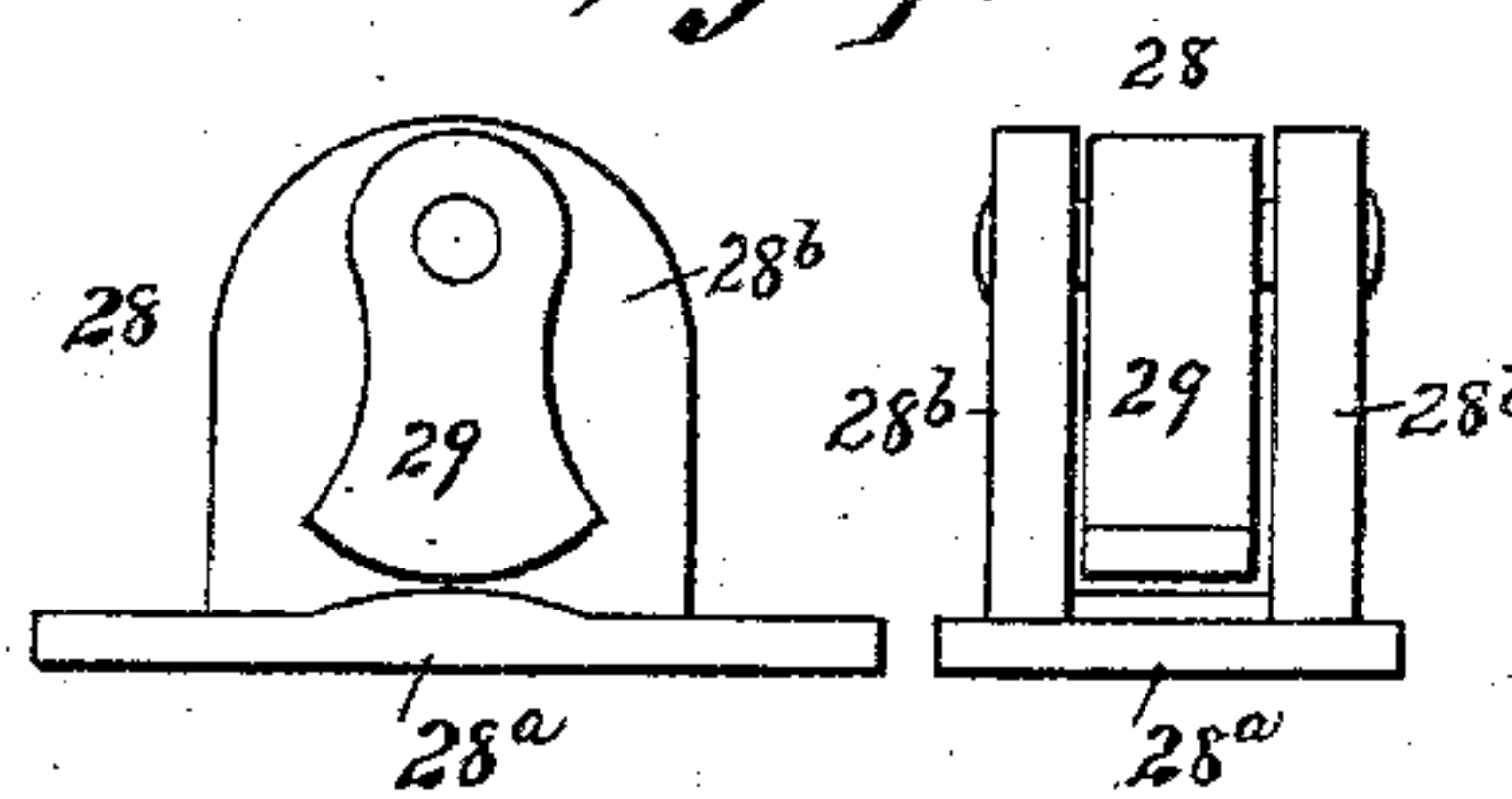
*Fig 5.*



*Fig 6.*



*Fig 7.*



*Fig 8.*

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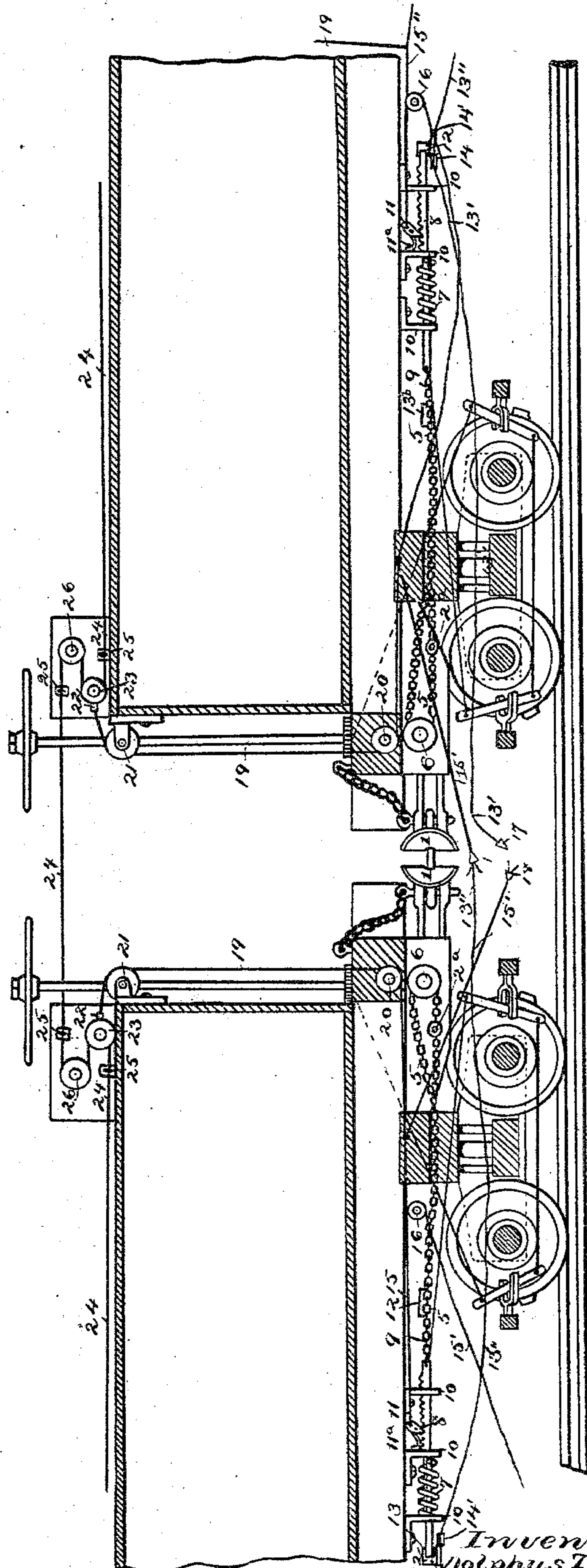
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Fig. 9.



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# UNITED STATES PATENT OFFICE.

DOLPHUS TORREY, OF NEW YORK, N. Y.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 287,889, dated November 6, 1883.

Application filed October 23, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, DOLPHUS TORREY, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Automatic Emergency Railway - Brake Apparatus, of which the following is a specification.

My invention relates to that class of brake mechanisms which are designed to produce an application of the brakes, upon an accidental severance of the train, to the wheels of the car or cars so severed.

My invention further relates to an arrangement of connections between the several mechanisms on the cars of a train, whereby when a severance of the train occurs the brakes are applied automatically upon all of the cars so severed.

My invention further relates to an arrangement of a train-cord connection with the brake mechanism, by means of which, also, an application of the brakes is effected upon a severance of the train.

To the above ends my invention consists, first, in the provision of an accumulator, the energy of which is stored by stress transmitted from the draw-bar, and which constitutes the motor element in applying the brakes, and also of a tripping device for preventing an expenditure of the energy of the said motor element excepting upon the occurrence of predetermined conditions.

My invention further consists in the provision of connections between the motor element of the mechanism of one car and the tripping element of the next succeeding car of the train, whereby upon a severance of the train the application of the brakes of the first car thus severed from the train shall produce an application of the brakes of all the following cars.

My invention further consists in the provision of a train-cord connected with the tripping device of the brake mechanism and acting to produce an application of the brakes upon a severance of the car from others of the train or by the pulling of the train-cord.

My invention further consists in certain devices, hereinafter described and claimed.

In order that my invention may be fully understood, I will describe it with reference to the accompanying drawings, in which—

Figure 1 is a plan view of part of the under side of the bed-frame of a car with parts of my improvements attached. Fig. 1<sup>a</sup> is a similar view of a car-bed frame, showing a modified form of transmitting-lever. Fig. 2 is a transverse vertical section on the line *a b* of Fig. 1<sup>a</sup>. Fig. 3 is a side elevation of the motor-spring and the tripping device with their accessories. Fig. 4 is a side elevation of parts of the contiguous ends of two cars with parts of my improvements attached. Fig. 5 is a plan view of the end of a car-roof, showing the arrangement of guiding devices for the train-cord. Figs. 6 and 7 are detailed views of a train-cord eye and chuck, respectively. Fig. 8 is a detached view of the devices for coupling the train-cord. Fig. 9 is a sectional view of two cars, showing the application of the several parts of the device.

In Fig. 1, 1 designates a draw-bar arranged to move longitudinally in bearings on the bed-frame. 2 is a transmitting-lever pivoted at one end to the bed-frame, and connected to the draw-bar by a pitman, 3, one end of which is pivoted to the draw-bar and its opposite end to the lever 2. The free end of the lever 2 is attached to one end of a chain, 5, which extends inwardly to a connection with the motor-spring, hereinafter described. The lever 2 is guided in its plane of rotation by a strap or bar, 4, attached to the bed-frame and passing beneath said lever. 8 designates a rack-bar mounted in hangers 10 beneath the car-frame. The outer end of this bar 8 is joined by a connection, 9, to one end of an equalizer, 13<sup>b</sup>, which carries guiding-sheaves, over which a chain, 13<sup>a</sup>, passes from one set of brakes to the other of the two trucks. A spring, 7, surrounds the outer end portion of the bar 8, one end of said spring being attached to the bar 8 and its opposite end resting against one of the hangers 10. 11 is a tripping-pawl controlled by a spring, 11<sup>a</sup>, and pivoted to the bed-frame of the car. One end of the pawl 11 engages with the teeth of the rack-bar 8, while its opposite end is connected with a cord, 15, for a purpose hereinafter set forth.

In Figs. 1<sup>a</sup> and 2, I have shown a modified form of transmitter, which I will now describe.

The draw-bar 1 is provided with a lug or pin, 1<sup>a</sup>. 2<sup>a</sup> is the transmitting-lever, which is of approximately Z shape, and turns in a box-



ing, 2<sup>b</sup>, upon the bed-frame. The inner member of the lever 2<sup>a</sup> extends across the draw-bar in front of its lug 1<sup>a</sup>. The outer member of the lever 2<sup>a</sup> at its free end is attached to the chain 5, which in this instance passes in the form of a loop over a pulley, 6, and thence inward to a connection with the rack-bar 8. Thus it will be seen that the outward movement of the draw-bar will result in a corresponding movement of the inner member of lever 2<sup>a</sup> and an inward movement of its outer end. The looped form of the chain 5 will cause the inward movement of the attached arm of lever 2<sup>a</sup> to be converted into a pull on the rack-bar 8. I prefer this form of transmitting-lever, for the reason that it meets the practical necessities of the mechanism in respect to the relatively-elevated position of the rack-bar and pulley 6 above the draw-bar.

From the above description it will appear that the outward movement of the draw-bar 1, acting upon the chain 5 through the lever 2 or 2<sup>a</sup>, as the case may be, will pull upon the rack-bar 8 and compress the spring 7. The spring-pawl 11, engaging with the teeth of bar 8, will prevent the spring 7 from expanding, and thus the power of said spring will be reserved for use until required.

It is to be understood that I do not confine myself to the precise form of spring here shown, nor, indeed, to the use of a spring, as I contemplate the use of a modified form of spring, or, in lieu thereof, a weight which is raised by the movement of the draw-bar, and which, in falling, applies the brakes, the purpose being to provide an accumulator which shall be capable of storing energy, and of expending the same at a proper time.

I will now proceed to describe the apparatus by means of which an automatic application of the brakes occurs, upon a severance of the train, to all of the cars thus severed.

To the inner extremity of the rack-bar 8 a lever, 12, is pivotally connected, said lever being fulcrumed at one extremity to the bed-frame of the car. To the free end of this lever 12 is connected a branched cord, 13. One branch, 13', passes over a pulley, 14, to the forward end of the car, (the car being considered as running to the left,) and the other branch, 13'', passes over a pulley, 14', to the rear end of the car. The pawl 11 at its free end is connected to a branched cord, 15, one branch, 15', of which passes over a pulley, 16, to the forward end of the car, and the other branch, 15'', passes to the rear end of the car, so that at the forward end of the car there are two cords—one, 13', from the spring, and the other, 15', from the trip—while at the rear end of the car there are also two cords—one, 13'', from the spring, and the other, 15'', from the trip. Now, the spring-cord 13'' at the rear end on one car is connected with the trip-cord 15' at the forward end of the following car, while the trip-cord 15'' on the forward car (first mentioned) and the spring-

cord 13' on the forward end of the rear car are not connected. This manner of coupling is the same for all the cars in the train. If the train is considered as moving to the right, the cords before connected will be disconnected and those before disconnected will be connected throughout the train. The manner of connecting these cords is by a separable coupling so constructed as that, upon a severance of the train, before the couplings at the point of severance become disconnected they will have transmitted the stress of the lever 12 to disengage the pawl 11. One form of this separable coupling is shown in Fig. 4; and it consists of a male member, 17, and a female member, 18, into which the male member enters. The jaws of the female member are of just sufficient strength to hold the coupling intact long enough to transmit the stress of the lever 12 and raise the pawl 11, after which the parts separate. When the pawl 11 is pulled out of engagement with the rack-bar 8, the spring 7 expands, throwing the rack-bar 8 inward. This swings the lever 13 and applies the brakes on that car. At the same time the inward movement of bar 8 swings the lever 12, and the latter pulls on the cords 13'' and 15' and raises the pawl 11 on the succeeding car. On this latter car the operation is repeated, and so on through all disengaged or severed from the train.

In connection with the devices above described I provide a train-cord connection, by which is produced an automatic or non-automatic application of the brakes. The arrangement of this apparatus is as follows: A cord, 19, is attached at one end to the free arm of the pawl 11, and passes beneath the car, around a pulley, 20, attached to the lower corner thereof, up over a pulley, 21, attached to the end of the roof, and thence along the roof to a connection with a bar, 22. This bar 22 constitutes a carrier for a movable pulley, 23, and moves longitudinally, so as to draw upon the cord 19. 24 designates the train-cord, which extends along the tops of the cars from end to end of the train, and passes through a guide 25, around the movable pulley 23, over a fixed pulley, 26, at a counter-tension to that upon pulley 23, thence through a second guide 25, and from thence to the next car, where it is passed in like manner through similar guides and over similarly-arranged pulleys, and so on throughout the train. By this arrangement, when a severance of the train occurs, the tension of the train-cord 24 pulls the bar 22, which draws the cord 19, lifting the pawl 11, and the brakes are applied. The advantage of the use of this train-cord is that it can be used to connect a number of cars provided with my automatic brake when other cars not so equipped are interposed among those thus equipped.

I do not confine myself to the precise arrangement of devices above described, as the number of pulleys may be increased more or less, and their relative positions may be



varied. The situation of the guides, pulleys, and train-cord may be upon other than the roof of the car.

The guides 25 are each composed of two parts—a body formed with a groove, 25<sup>a</sup>, and a spring, 27, attached to the body in such manner as to overlap the top of the groove 25<sup>a</sup>, and thus prevent the train-cord from getting out of the groove.

In Fig. 7 I have shown a gripper, 28, which is to be used in connection with the train-cord 24 in case it is desired that the said train-cord shall act only upon the cars detached. The gripper is composed of a base, 28<sup>a</sup>, having two vertical standards, 28<sup>b</sup>, cast thereon. Between the standards 28<sup>b</sup> is a pendent dog or latch, 29, which swings freely from a pivot-bearing at its upper end in the standards 28<sup>b</sup>. The distance between the lower edge of the latch 29, when hanging idle; and the upper face of the base 28<sup>a</sup> is enough less than the diametric measurement of the cord 24 to cause said latch to bind the cord between its lower edge and the base 28<sup>a</sup>, and thus grip said cord, preventing it from moving in one direction, while permitting its free movement in the contrary direction, as is determined by the operator. Thus upon a severance of a train the gripper upon the last car remaining attached to the train, if properly set, will prevent a backward pull on the cord ahead of itself; but those on the severed cars permitting a forward pull will not prevent an effective action of the train-cord. It will be seen that by means of this train-cord arrangement I am enabled also to produce an application of the brakes voluntarily, since if an attendant pulls upon said cord he will cause the brakes to be applied.

In order to prevent confusion in making the separable coupling-connection for the spring and trip cords, before described, the spring-cords at both ends of the car should have the same coupling element or member—say, for instance, the male member—while the trip-cords at both such ends should have the opposite member.

The description of my invention has been of its application to the brakes directly; but I contemplate its use instead to engage a friction-brake operated by axle rotation, as shown in my application filed October 14, 1882, and otherwise.

The special places and manner of attaching

the parts of the apparatus to the car herein described are not given as specific and exclusive, but only as illustrative, it being evident that mechanical convenience will suggest immaterial alterations in detail.

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

1. A car-brake operated, through mechanism substantially as described, by an accumulator the energy of which is stored by stress transmitted directly from a longitudinally-moving draw-bar adapted to slide in bearings of the car-frame, as set forth.

2. In a car-brake operating through an accumulator the energy of which is stored by stress transmitted directly from a longitudinally-moving draw-bar, as described, the connecting mechanism consisting of cords moving over pulleys, and having male and female termini, as described, in combination with the tripping mechanism, which will operate as set forth when the said cars are severed.

3. In combination with the tripping mechanism of a car-brake, operated through an accumulator the energy of which is stored by stress transmitted directly from a longitudinally-moving draw-bar, as described, a train-cord moving over pulleys, and adapted to operate as set forth when the cars are severed.

4. The combination of the draw-bar arranged in suitable bearings, a transmitting-lever connected to the bed-frame and to the draw-bar by means of a pitman, and an inwardly-extending chain connected to a rack-bar having a spring interposed between said hangers, and being pivoted at its rear end to a lever, for the purpose described, and having a pawl with tripping-cord, as and for the purposes set forth.

5. In combination with the accumulator-brake, as described, the equalizer 13<sup>b</sup>, having connecting-chain 9, as set forth.

6. In combination with the tripping mechanism, as described, the cord 19, the pulleys 20 and 21, the carrier-bar 22, bearing movable pulley 23, the train-cord 24, guides 25 25, and fixed pulley 26, to operate substantially as set forth upon the severance of the cars.

DOLPHUS TORREY.

Witnesses:

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WM. B. CARPENTER.