

(No Model.)

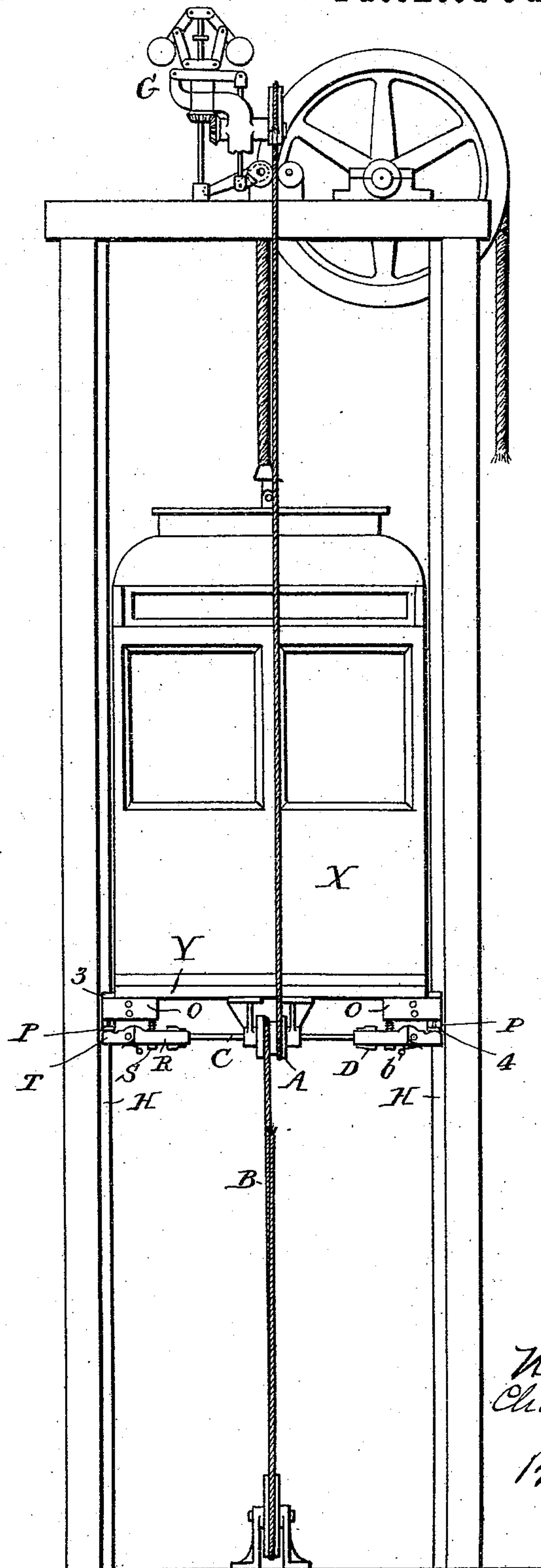
2 Sheets—Sheet 1.

C. E. BURROUGHS & N. P. OTIS.  
SAFETY DEVICE FOR ELEVATORS.

No. 543,641.

Patented July 30, 1895.

*Fig. 1.*



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Attorneys

(No Model.)

2 Sheets—Sheet 2.

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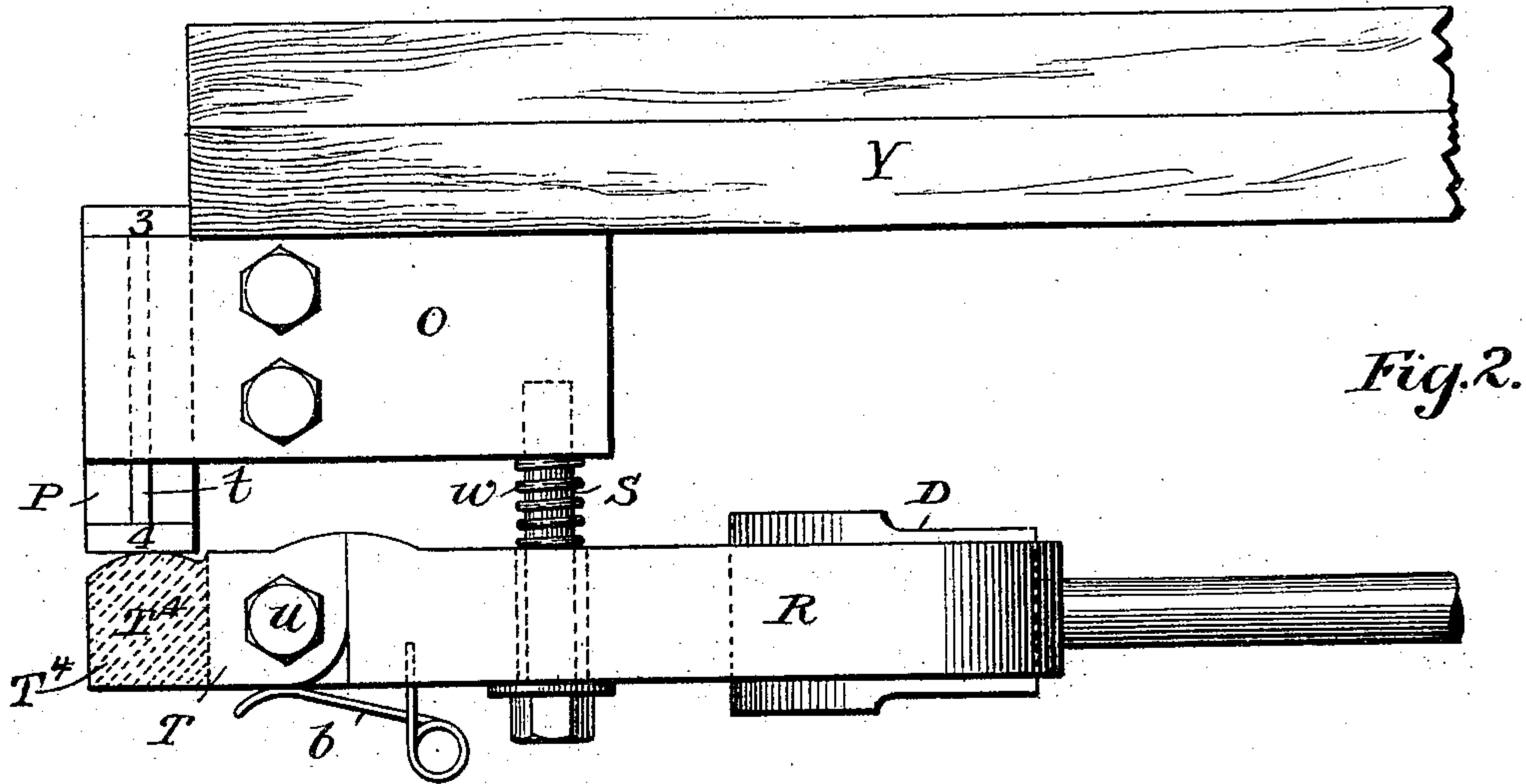


Fig. 2.

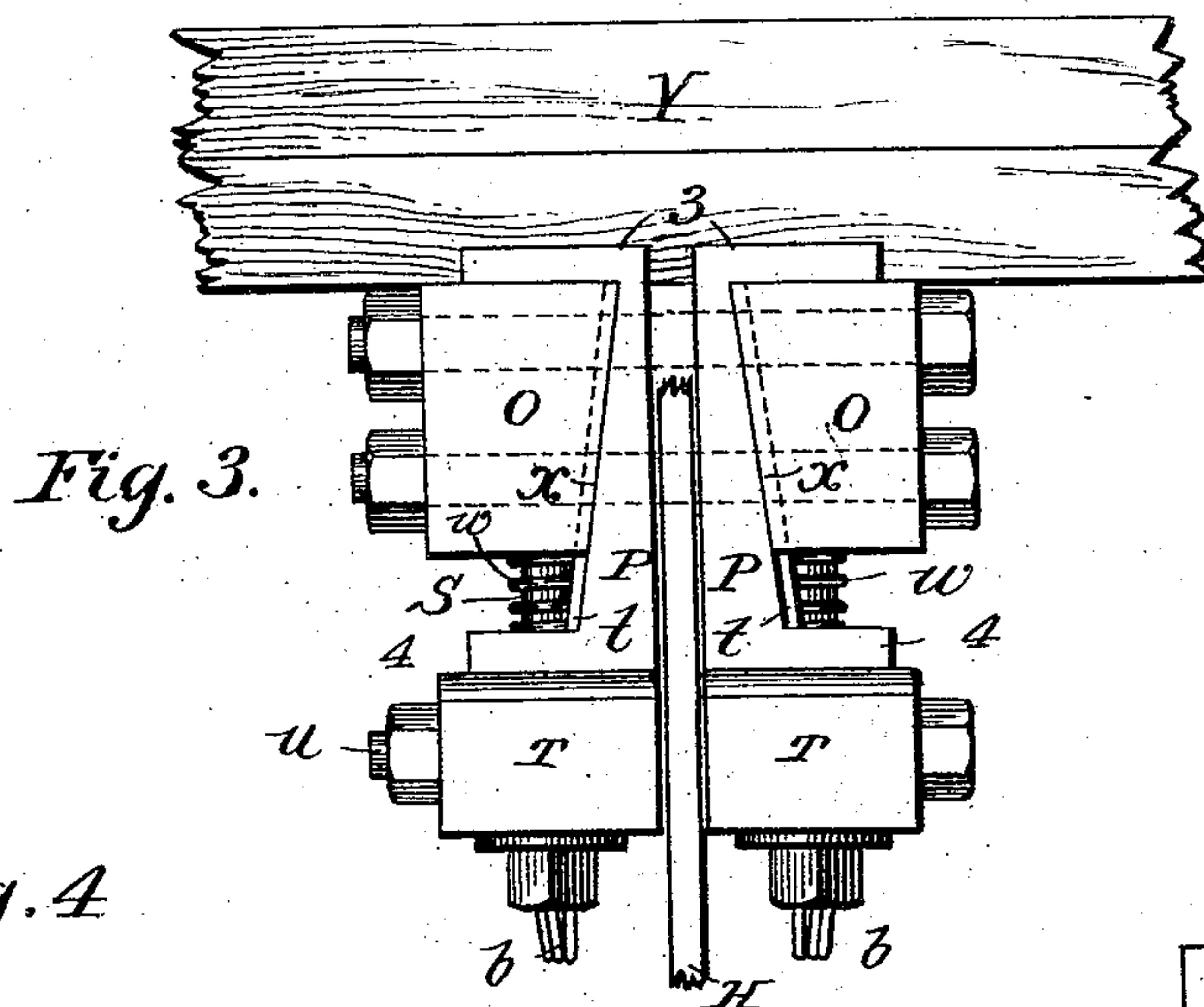
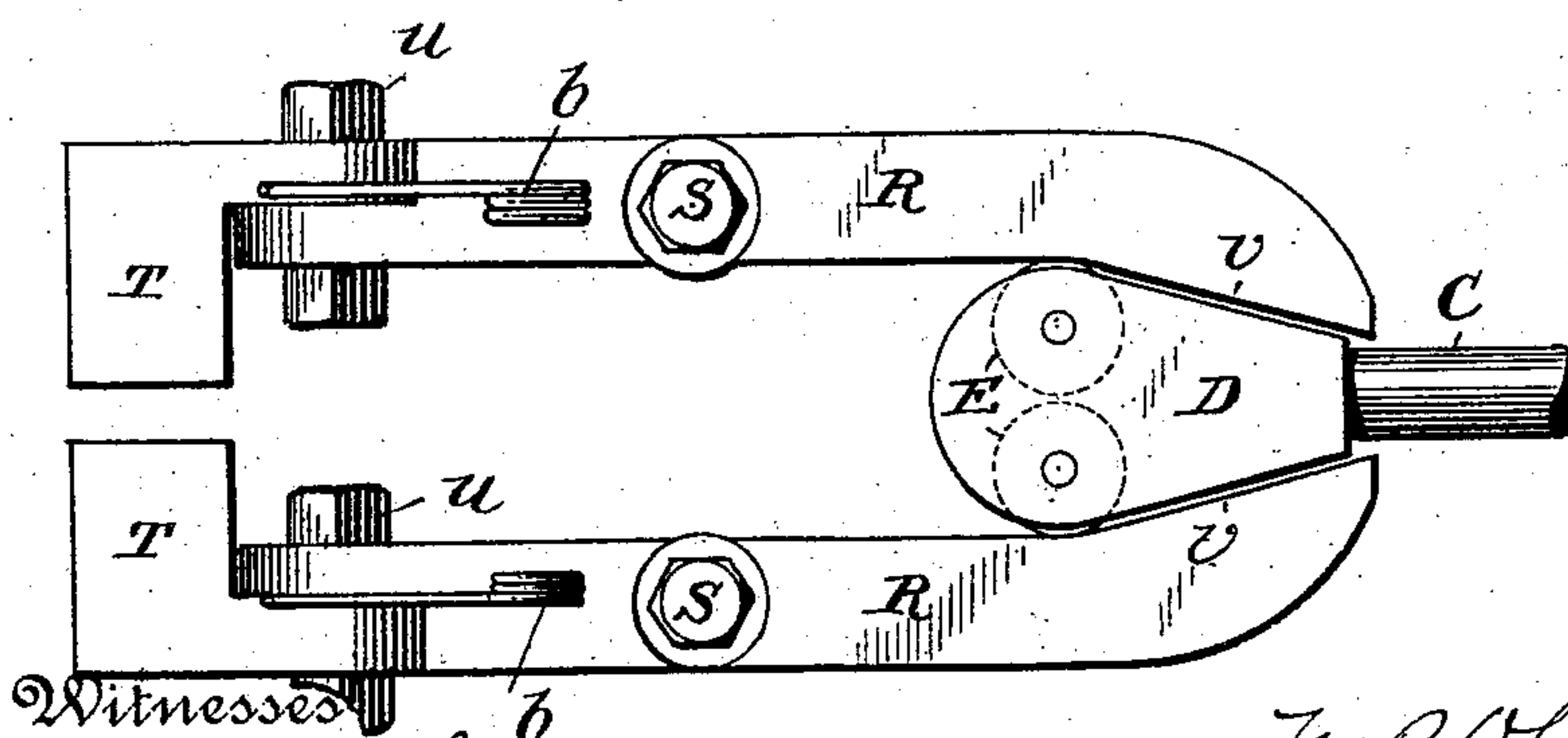


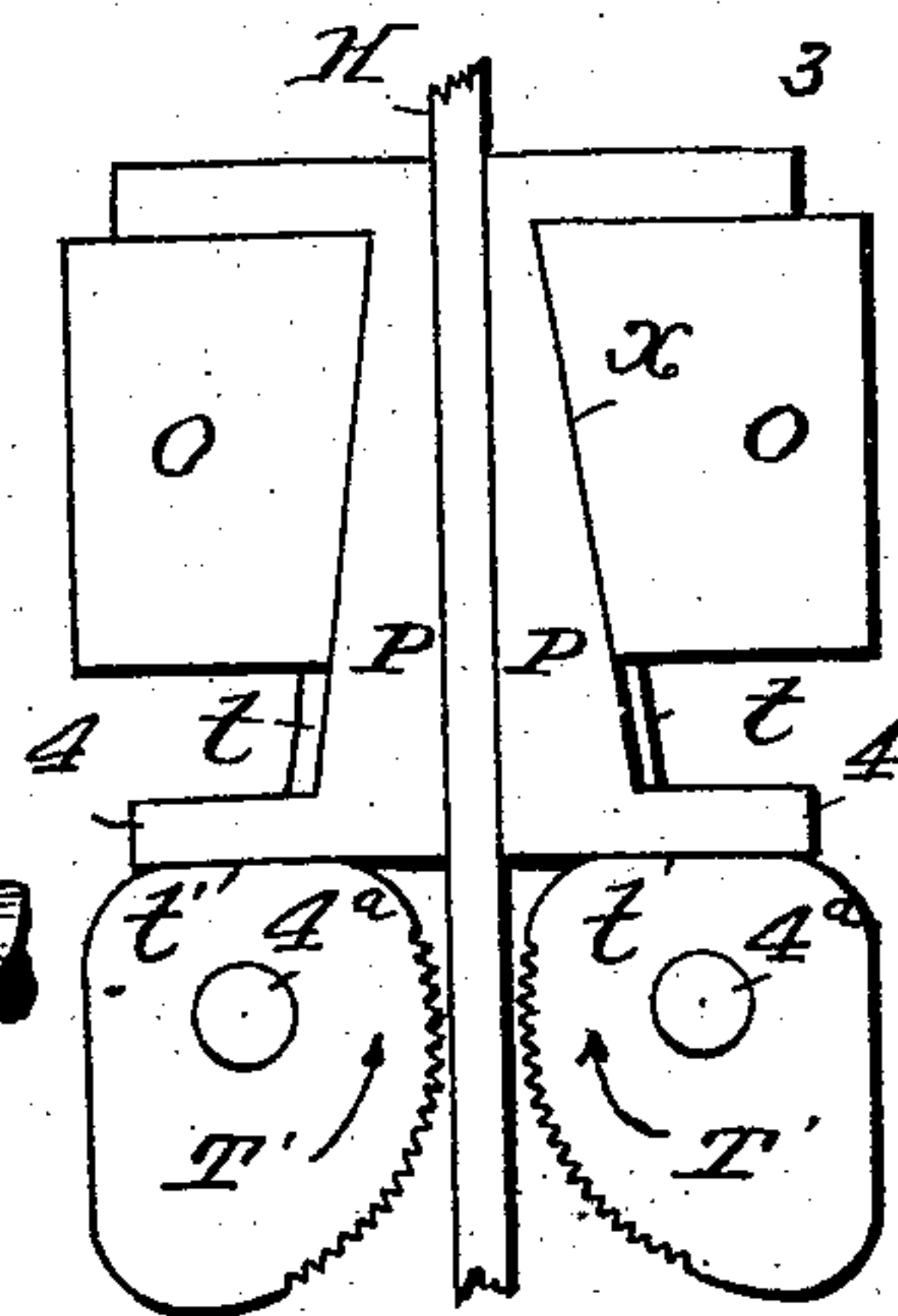
Fig. 3.

Fig. 4.



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Fig. 5.



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# UNITED STATES PATENT OFFICE.

CHARLES E. BURROUGHS AND NORTON P. OTIS, OF YONKERS, ASSIGNORS  
TO THE OTIS BROTHERS & COMPANY, OF NEW YORK, N. Y.

## SAFETY DEVICE FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 543,641, dated July 30, 1895.

Application filed November 17, 1894. Serial No. 529,156. (No model.)

*To all whom it may concern:*

Be it known that we, CHARLES E. BURROUGHS and NORTON P. OTIS, citizens of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Safety Devices for Elevators, of which the following is a specification.

Our invention has for its object to automatically arrest the motion of an elevator-cage in case said motion should be unduly accelerated; and to this end we make use of certain clamping-wedges and certain clamping-levers for clamping the guides and operating said wedges, as fully set forth hereinafter and as illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of an elevator apparatus, showing our improvement. Fig. 2 is a side view of the platform-beam and its connections; Fig. 3, an end view of the parts shown in Fig. 2. Fig. 4 is an inverted plan view of Fig. 2. Fig. 5 is a view showing a modification.

The cage or platform X of the elevator is constructed in any suitable manner, and is provided with the usual platform-beam Y, and beneath the latter, near each end, is a cast-steel block O, securely bolted in place, with a slot or recess in that portion which projects beyond the side of the cage.

The faces  $xx$  of each slot or recess are diverged toward the lower ends, as illustrated in Fig. 3, and are adapted to corresponding inclined faces of shoes or wedges P P, occupying positions upon opposite sides of the usual guide H, each wedge P having a flange 3 at the upper end, which limits its downward movement, and a flange 4 at the lower end.

A rib  $t$  upon the inclined face of each wedge P fits a corresponding groove in the opposite inclined face of the block O, which serves as a bearing for the wedge and serves to prevent it from moving in any except a vertical direction. If, when the cage is descending at too great a speed, the wedges P are lifted, they will be brought frictionally against the faces of the guide and will tend to adhere thereto, and as the cage descends the said wedges will be more and more tightly wedged between the

faces of the guide and the inclined faces  $x$ , so that the cage is gradually arrested. Normally the wedges occupy the position shown in Fig. 3, their flanges 3 resting upon the top edge of the block and their faces free from frictional contact with the guide H, and in order to lift the wedges when the cage attains an undue speed I make use of the appliances which I will now describe.

Beneath the flange 4 of each wedge extends one end of a lever R, which is pivoted so as to swing or vibrate laterally upon a bolt S, dependent from the block O, a spring  $w$  bearing upon the top of the lever R and tending to keep this in its lowest position in contact with the head of the bolt S.

Between the converging faces  $vv$  of each pair of levers R R intervenes a wedge D (or a block carrying two antifriction-rollers E E, which act as a wedge when drawn back) to spread apart the inner ends of the levers R R and cause their outer ends to be brought into frictional contact and clamp the guide H. It will be seen that just as soon as the outer ends or jaws of the levers R clamp the guide H they will tend to adhere thereto, and consequently the descent of the cage will bring the inclined faces  $x$  of the blocks O against the inclined faces of the relatively-stationary wedges P, which will thus be forced against and caused to also bind upon the guide with a force increasing as the cage descends.

While each lever R may consist of a single bar, we prefer to provide the end of each lever with a pivoted jaw T, connected to the other portion of the lever by means of a transverse bolt  $u$ , the jaw having a bearing against the end of the lever, which limits the extent to which the jaw can swing upward, while a spring  $b$  tends to maintain the jaw in its upward position, but permits it to swing downward when required. Preferably the end or face of the lever or jaw that makes contact with the guide H is serrated, and we prefer to make such serrations in the form of inclined ribs, as illustrated in dotted lines  $T^4$ , Fig. 2.

When the levers R are caused to clamp the guide, and the cage continues its descent, as described, the levers R adhering to the guide will, together with the wedges, remain relatively stationary and the further descent of



the cage will compress the springs *w* until the movement of the cage is arrested. When the cage is to be released it is only necessary to lift the same, when the wedges, as well as the levers *R*, will tend to adhere to the guide, and the upward movement of the cage will finally raise the inclined faces of the blocks *O* away from the inclined faces of the wedges *P*, leaving the latter free to fall, and the springs *w* will carry the levers to the limit of their lower position.

The releasing action is further facilitated when the levers are provided with pivoted jaws *T*, as described, and as the cage begins to rise these jaws, adhering at their clamping faces to the guide, will gradually tilt downward and release the wedges and permit the parts to quickly resume their original positions. Owing to the angular direction of the serrations upon the faces of the jaws the latter will more readily swing downward when the cage is raised than if the serrations were arranged otherwise.

While we have referred to the jaws *T* as being pivoted, as described, they may be in the form of cams turning upon studs or pivots *4<sup>a</sup>* at the ends of the levers *R*, as shown in Fig. 5. As shown, each cam or eccentric *T'* is serrated at the edge and of such a shape that there will be a gradually-accumulating biting action as the cam turns in the direction of the arrow after the levers have been swung toward the guide *H*, while the upper edge *t* of the cam, as the latter is turned, will bear against and elevate the wedge *P*.

Different means may be employed for separating the inner ends of the levers *R* or for swinging them in order to cause the outer ends to clamp or bite the guide.

As shown in Figs. 1 and 2, each wedge *D* is connected with a rod *C*, the two rods *C* having reversely-threaded ends which enter the threaded recess in a drum *A*, around which is coiled a cable *B*, that extends upward and over a pulley connected with a governor *G* and downward to the bottom of the well around a guide-pulley, the governor operating eccentrics when the speed of the cage is too fast, which eccentrics then clamp the cable and arrest it, so as to turn the drum, thereby drawing inward each wedge *D* and causing the levers *R* to clamp the guide. The arrangement of cable and governor above described is set forth fully in Letters Patent to C. R. Otis, No. 228,107, and need not be here more fully set forth; and we do not claim the arrangement of drum, wedges, and connecting-rod for operating the levers, as this constitutes the subject of a separate application for Letters Patent, Serial No. 529,157.

While we have referred to two vibrating levers *R R*, at each end of the platform bar, it will be evident that one of the said levers

may be stationary, constituting a part of the bracket or block *O*, as may also one of the wedges *P*, there being but one wedge and lever at each end of the bar, operating with like effect as if two were used.

Without limiting ourselves to the precise construction and arrangement of parts above described, we claim as our invention—

1. The combination with an elevator cage and the guides *H* therefor of blocks *O* having inclined faces, and wedges *P* having corresponding inclined faces and arranged to bear upon the sides of the guides *H*, levers pivoted to swing to and from the guide and capable of vertical movement to lift the wedges, and means for causing the levers to clamp the guides automatically when the cage attains an undue speed, substantially as set forth.

2. The combination with the vertically movable wedges carried by an elevator car at the sides of the guides, bearings for said wedges, pivoted levers adapted to move to and from the guide to clamp the same, and to move vertically to lift the wedges, substantially as described.

3. The combination with the cage or platform, of the vertically movable wedges *P* and bearings therefor, levers *R* extending beneath said wedges, vertical bolts to which said levers are pivoted and springs *w*, substantially as set forth.

4. The combination of the cage, vertically movable wedges and bearings therefor, levers *R* and jaws pivoted to said levers and arranged to engage with side faces of the guide and springs for maintaining the jaws in their upward positions, substantially as set forth.

5. The combination with the cage, wedges and levers *R* of jaws *T* pivoted by transverse bolts *U* and provided with inclined serrations, substantially as and for the purpose set forth, and springs *b* for moving the jaws in one direction, substantially as described.

6. The combination with the vertically movable wedges carried by an elevator car at the sides of the guides, bearings for said wedges, pivoted levers adapted to move to and from the guides to clamp the same, and to move vertically to lift the wedges, the vertically movable jaws pivoted to the levers and adapted to engage the guides, means for maintaining said jaws in their upward positions, and devices for causing the levers to automatically move toward the guides to throw the jaws in contact therewith, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

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NORTON P. OTIS.

Witnesses:

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GEORGE D. ROSE.