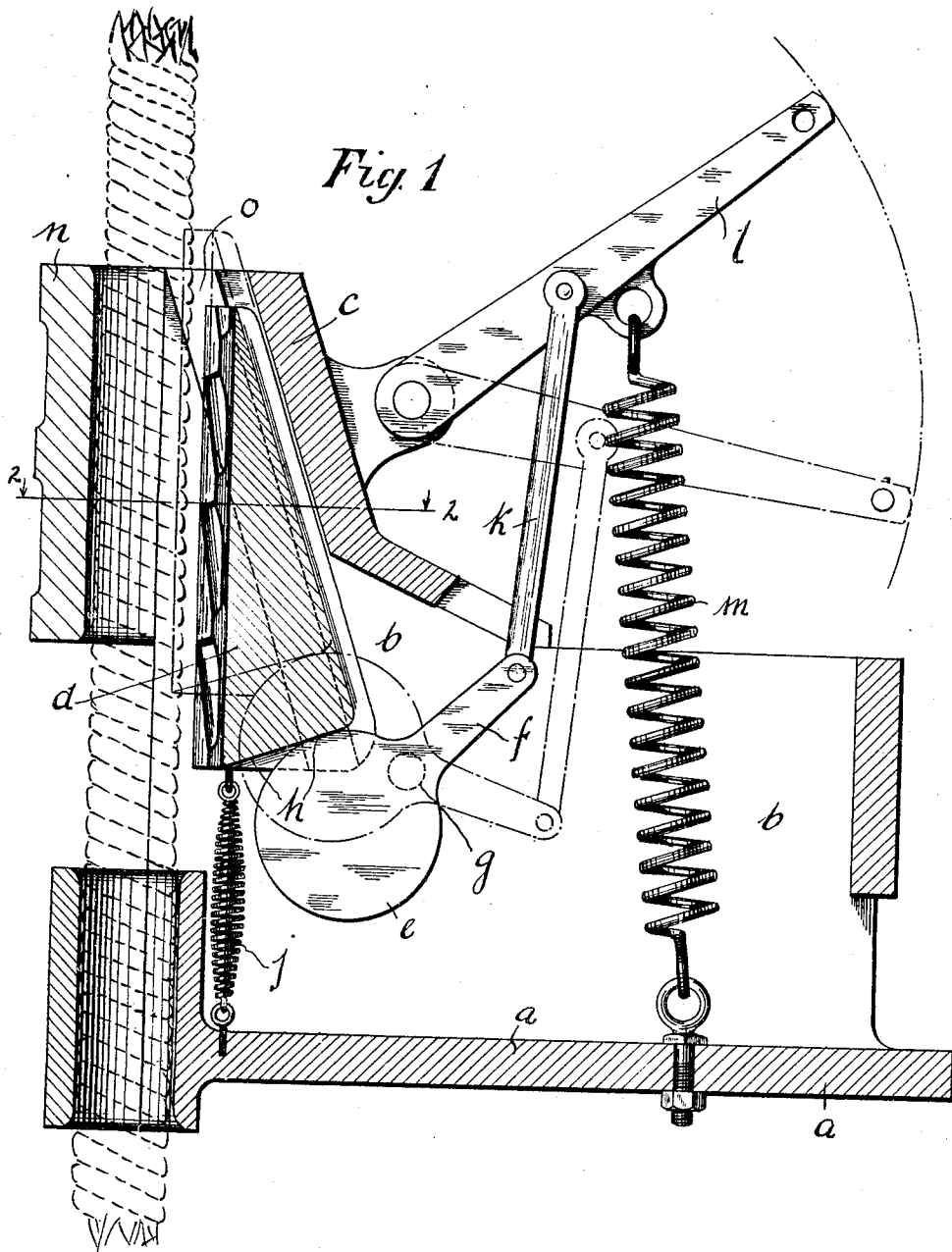


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SAFETY DEVICE FOR MINE CAGES, LIFTS, AND THE LIKE.
APPLICATION FILED MAY 2, 1919.

1,389,867.

Patented Sept. 6, 1921.
3 SHEETS—SHEET 1.



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By:- B. Singer, Atty.

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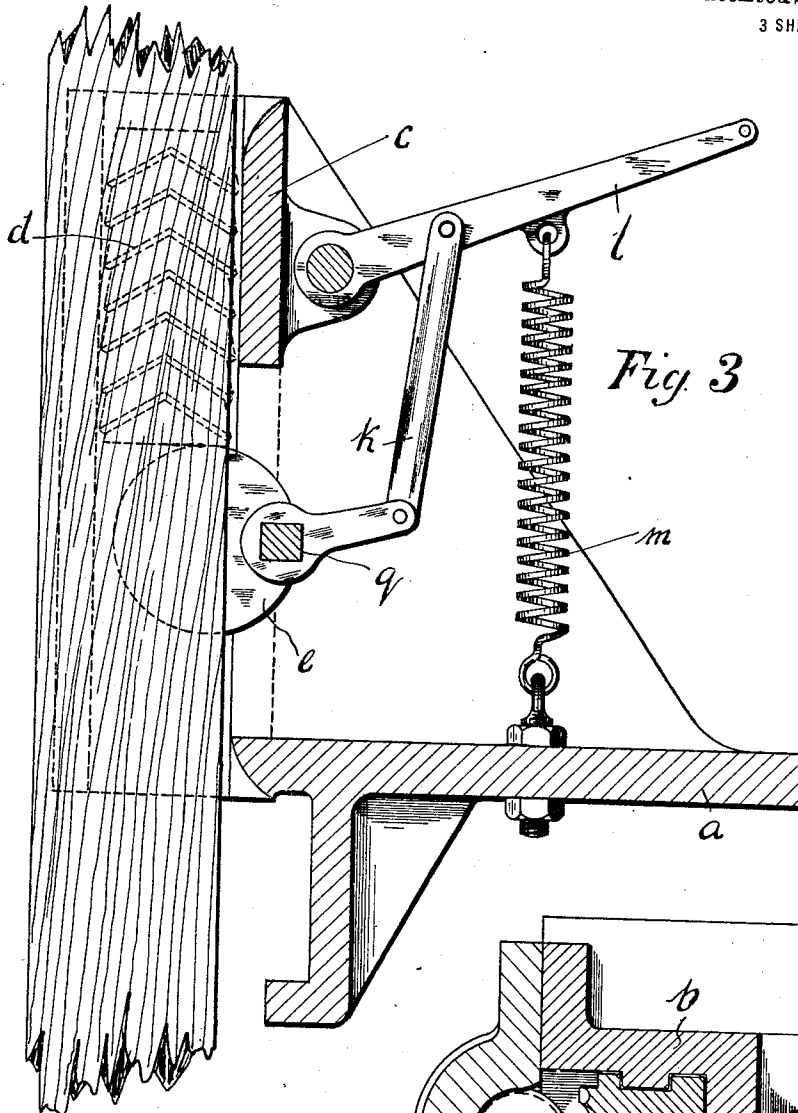


Fig. 3

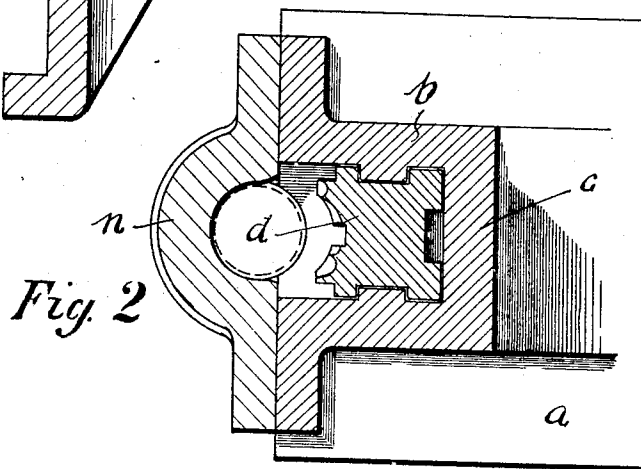


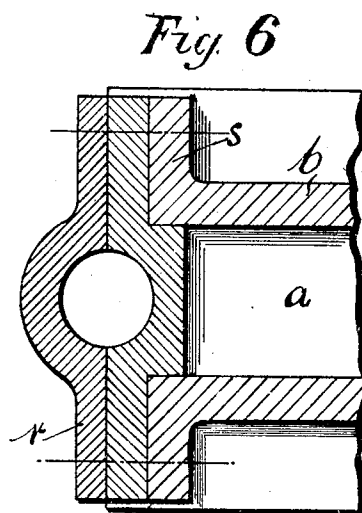
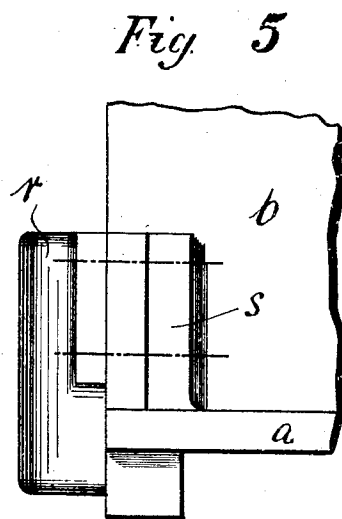
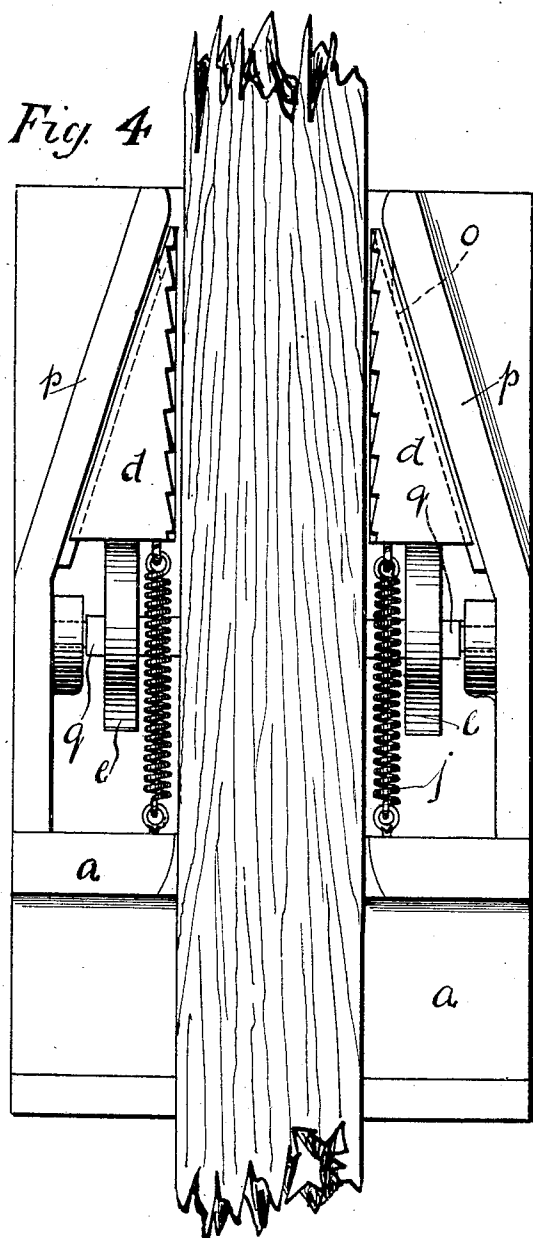
Fig. 2

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UNITED STATES PATENT OFFICE.

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SAFETY DEVICE FOR MINE-CAGES, LIFTS, AND THE LIKE.

1,389,867.

Specification of Letters Patent.

Patented Sept. 6, 1921.

Application filed May 2, 1919. Serial No. 294,276.

To all whom it may concern:

Be it known that I, WILLIAM GRIFFIN, subject of the King of Great Britain, residing at 27 Parson street, Wilnecote, near Tamworth, England, have invented certain new and useful Improvements in Safety Devices for Mine-Cages, Lifts, and the like, of which the following is a specification.

This invention comprises improvements in safety devices for mine cages, lifts, and the like of the type in which wedge gripping devices are actuated by levers or eccentrics to act upon the guides and has for its object to provide an improved arrangement which can be mounted on the top of the cage, so that it is applicable to existing cages; and further has its operating means disposed away from the outer sides of the cage so as to be easy of access for attention, and so as to be clear of the walls or sides of the shaft in which the cage travels.

Characteristic features of the invention are—(1) the operation of the wedges by eccentrics which are not connected to the wedges so that the movement of the block is not limited and the retraction of the block is effected independently of the lifting or hauling means for the cage to which the eccentrics are connected and by which they are normally held in an inoperative position; (2) the arrangement of the eccentrics and the lever to operate same so that they work in planes perpendicular to the side of the cage which is toward the guide on which the cage travels.

The advantage of this construction is in addition to its being applicable to existing or new cages, that the wedge blocks will grip the guides even if the latter are worn and considerably reduced in thickness. Another advantage is that the grip is not released by pulling the blocks downward, but by the lifting of the cage which prevents a sudden fall if there is a failure in the lifting means directly after the pull has come upon the lifting cable.

To enable the invention to be understood and easily carried into practice I have appended hereunto three sheets of explanatory drawings.

Figure 1 is a sectional view of an embodiment of the invention.

Fig. 2 is a cross section thereof on line 2—2 of Fig. 1.

Fig. 3 is a similar view to Fig. 1 but showing a modification.

Fig. 4 is a view looking from the left at Fig. 3.

Figs. 5 and 6 illustrate a constructional detail.

I arrange the safety devices upon the top of the cage or the like and the number of devices employed may vary with the number of guides on which the cage or the like works. For example with two guides I provide two gripping devices, but with four guides I may use only two oppositely disposed devices, or may employ four as desired.

As shown at Fig. 1 each device is provided with a stout attachment plate *a* for bolting on to the top of the cage, and upstanding cheeks or side plates *b* project from this plate in a position which will be adjacent to one of the guides. The side margins of the plates which are toward the guides may be vertical but the rear margin near the top of the plates may taper practically to a point so that at this part the rear edge is inclined at a small angle say for example at 20° to 30° to the vertical and at these inclined edges is a stout inclined cross piece or thrust plate *c* the inner face of which is toward the guide and forms the inclined plate on which the wedge for gripping the guide is to work. The attachment plate *a* upstanding portions *b* and inclined cross member *c* may form one single casting suitably webbed and strengthened where required. At the upper part a pocket is thus formed in which the loose wedge *d* works and below same is a housing or space for an eccentric roller, or eccentric *e* on an arm *f* and a fulcrum *g* for a lever or arm to rock the eccentric to lift the wedge when required.

Suitable guiding projections and grooves between the wedge *d* and its housing may be provided while at the bottom portion the wedge is recessed as at *h* to straddle over the eccentric and provide a plane for the latter to act upon. The wedge is normally retracted by the lifting of the cage and the attachment plate and like parts so that gravity helps the block on to its eccentric, but a spring or springs such as *j* may be used to

assist this action and keep the block in position.

The eccentric and operating lever may be mounted by trunnions *g* working in recesses 5 in the side plates of the device, or by an axle secured in holes or bearings in the said side plates. The lever *f* may be prolonged and operated direct but in some cages it is necessary to provide space for parts of the cage 10 gear and therefore the lever *f* is shown as connected by a link *k* to a lever *l* mounted for example on the plate *c*. To the lever *l* a spring or springs *m* may be connected, which may be assisted by weights if desired, tend- 15 ing to draw the lever down and throw the wedge into action, but normally the end of the lever is held up by being attached by a bridle chain or the like to the ring or the like by which the cage is connected to the 20 hauling cables.

In use as stated, two or more devices are mounted on the cage to engage opposite guides and as the hauling cable is taut the 25 bridle chains pull up the ends of the levers *l* and the wedges *d* are out of action as stated above. In the case of a breakage of the rope or slacking of the cable through any cause the levers *l* are instantly pulled down thus throwing the loose wedges *d* into 30 action simultaneously so that the cage is held to the guides before it can acquire any momentum due to gravity.

It will be understood that the faces of the wedges will be adapted in shape for the 35 particular guides on which they are to act; also they are roughened or serrated for the better gripping of the guides. In the case of cable guide ways I provide for bolting or otherwise attaching to the device a shaped 40 abutment plane *n* for traveling at the back of the guide so that the cable is backed by a rigid support against which the wedge clamps the cable when the device comes into operation.

To relieve the plates *c* of some of the thrust of the wedge *d* I may groove the 45 sides of the wedge and provide the side plates *b* with stout ribs *o* (Fig. 2) in engagement therewith.

The device may be applied on similar 50 lines to guides of timber and if the wedge works upon the face of the guide which is toward the cage the side plates *b* preferably have projecting lugs for riding on the 55 sides of the guide.

I prefer in the case of timber guides to arrange the wedges to work on the sides to avoid the sudden load bursting out of the 60 guide.

Figs. 3 and 4 show two wedges *d* arranged in side extensions or pockets having 65 inclines or thrust plates *p* with two eccentrics *e* on a single cross shaft *q* and in the center of this shaft *q* the lever or arm *f* is

secured and connected by a link *k* with the 65 lever *l*.

The gripping face or faces of the wedge or wedges should be extensive to provide 70 substantial bearing surfaces between it and the guide when they come in contact and in the case of a wood guide the face of the 75 wedge is provided with ratchet like teeth or other gripping means. I prefer teeth of inverted V form, as shown at Fig. 3, extending right across the face of the wedge 80 so as to avoid splintering of the face of the guide outwardly which would render the sliding of the cage on the guide difficult after the safety device had been in use. In the case of cable guides I prefer to secure 85 on the attachment plate *a* a guide *r* both halves of which are bodily removable from, or attachable to, the lugs *s* in the plate *a* as shown in Figs. 5 and 6 on Sheet 3 of the 90 drawings.

I claim:—

1. A safety device for mine cages having in combination, an attachment plate for securing on the top of the cage, a pocket part 95 rigid with said plate and sliding on the cage guide as the cage travels, an inclined wall to said pocket, a loose wedge in said pocket with a face toward the guide, an eccentric below said wedge for operating 100 same, independent means for withdrawing said wedge, and means connected to the supporting means for the cage for operating said eccentric, all of said parts being carried on said attachment plate.

2. A safety device for mine cages having 105 in combination an attachment plate for securing on the cage, said plate carrying a pocket part traveling on the cage guide, an inclined wall to said pocket, a loose wedge in said pocket with a face toward the guide, 110 an eccentric below said wedge, a lever on said pocket part, a spring for depressing said lever, a link between said lever and an arm actuating said eccentric, and means 115 connecting said lever to the means for supporting the cage and thus normally holding up the lever against the action of said spring.

3. A safety device for mine cages, comprising an attachment plate carrying a part for 120 moving on the cage guide, a loose wedge housed in said part, and eccentric means for actuating said wedge, said eccentric means working in planes perpendicular to the side of the cage which is toward the 125 cage guide.

4. A safety device for mine cages comprising in combination an attachment plate for securing to the top of the cage, a part on 130 said plate embracing the cage guide, and having inclined slots between said part and the sides of the guide, loose wedge blocks in said slots, an eccentric below each block,

and means connected to said eccentrics and to the means for supporting the cage for operating said eccentrics. in said slots, an eccentric below each block, 10
a lever on said part embracing the guide, means for depressing said lever and a connection from the lever to said eccentrics, and from said lever to the means for supporting the cage. 15

5 5. A safety device for mine cages comprising in combination an attachment plate for securing to the top of the cage, a part on said plate embracing the cage guide, and having inclined slots between said part and the sides of the guide, loose wedge blocks

In testimony whereof I affix my signature.

WILLIAM GRIFFIN.