K. TEICHMANN.

ELEVATING APPLIANCE FOR USE IN MINES AND THE LIKE.

APPLICATION FILED DEC. 28, 1907.

919,492.

Patented Apr. 27, 1909.

5 SHEETS—SHEET 1.

Fig. 2.

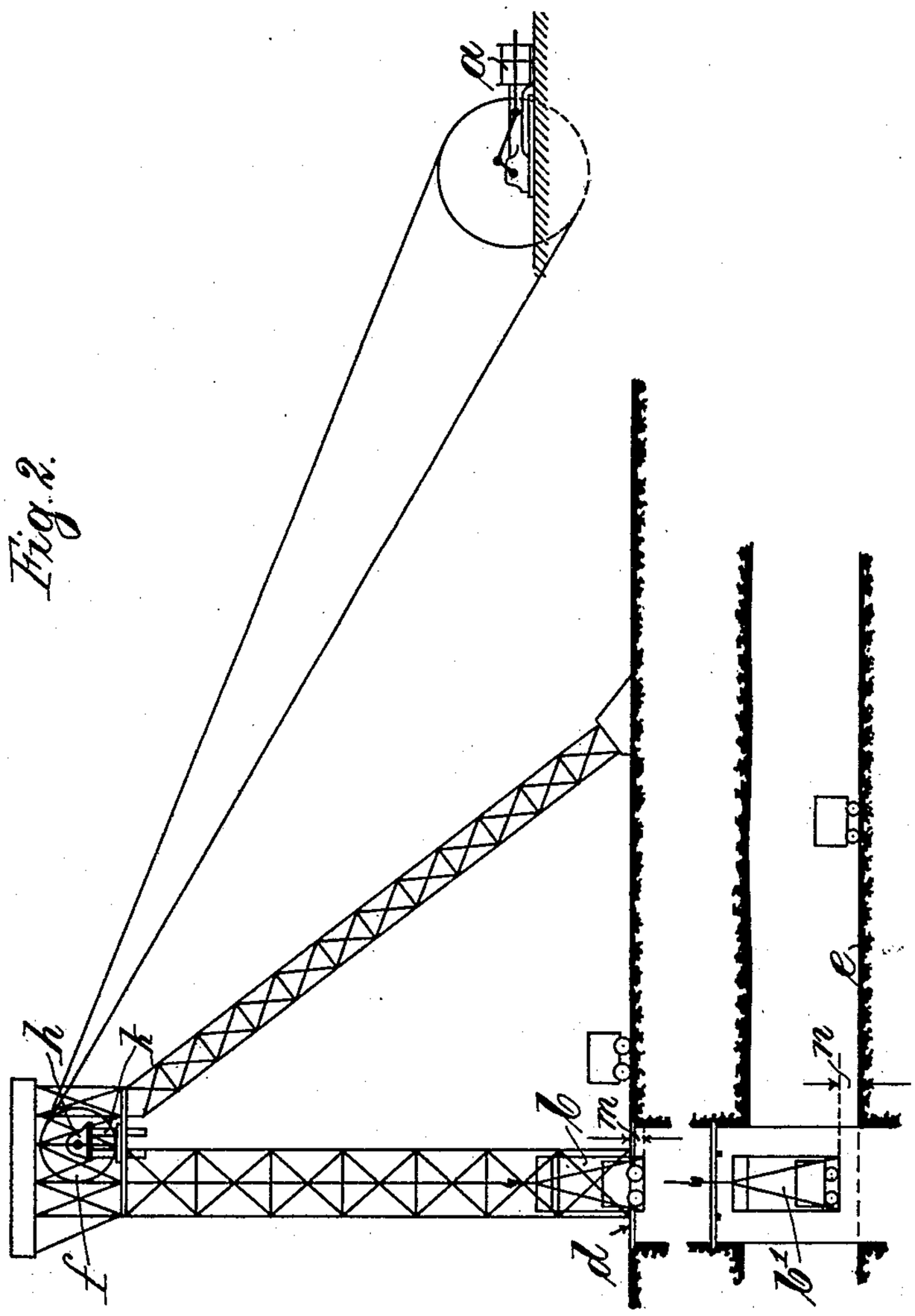
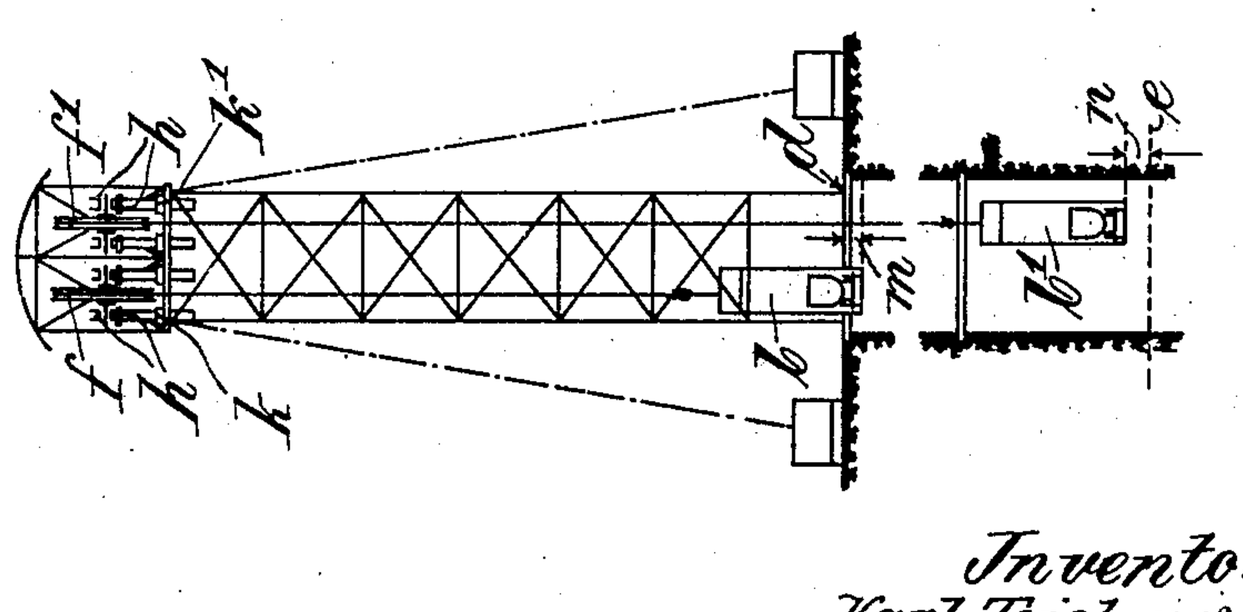


Fig. 1.



Witnesses:
Paul Hinkelmann.
Emil Kayser.

Inventor:
Karl Teichmann.
by: Pierce, Fisher & Pierce
Attorney.

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Fig. 4.

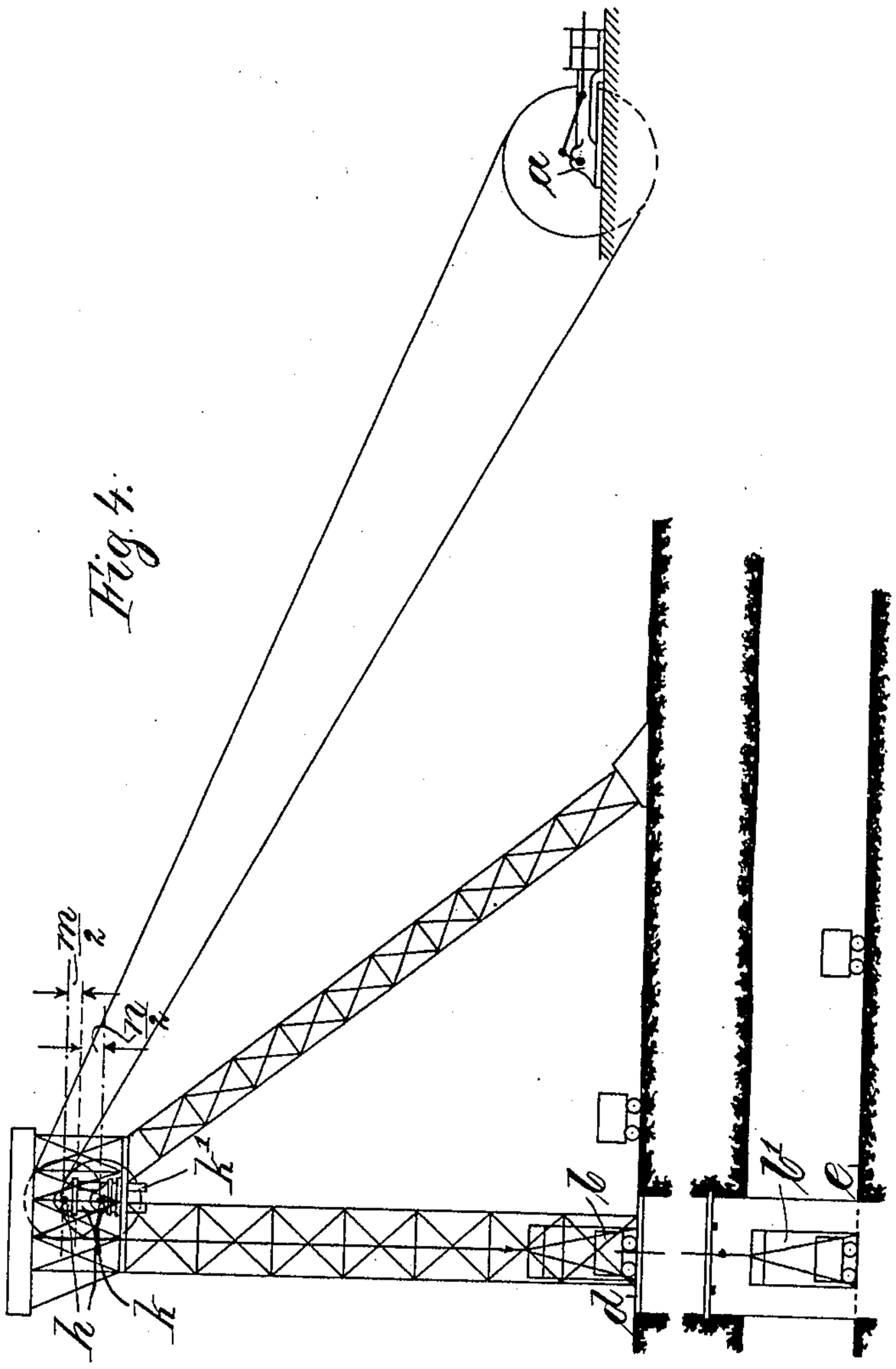
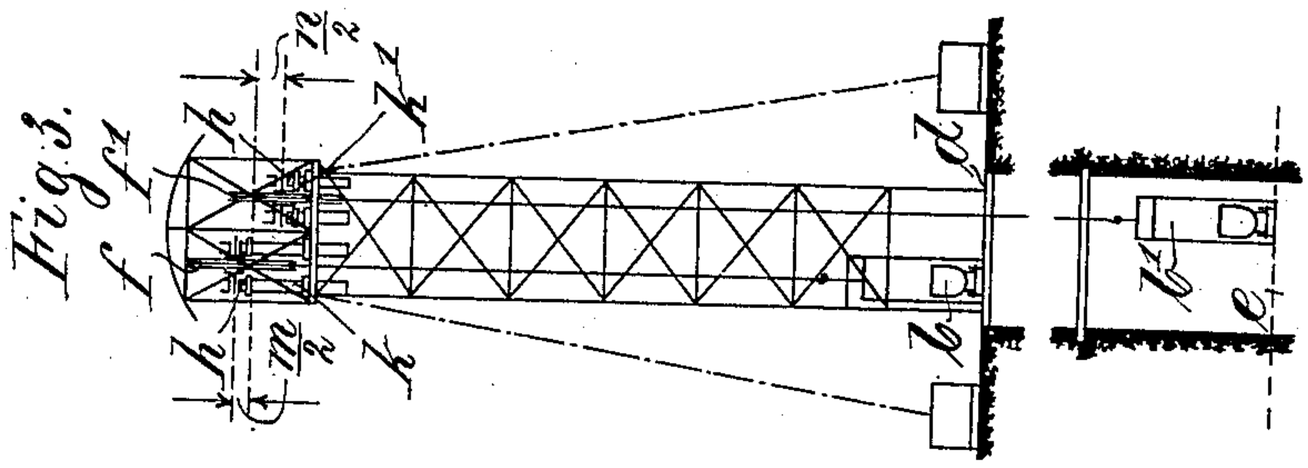


Fig. 3.



Witnesses:

Paul Hinkelmann.

Emil Kayser.

Inventor:

Karl Teichmann.

by: Peter Deuffler

Attorney.

K. TEICHMANN.

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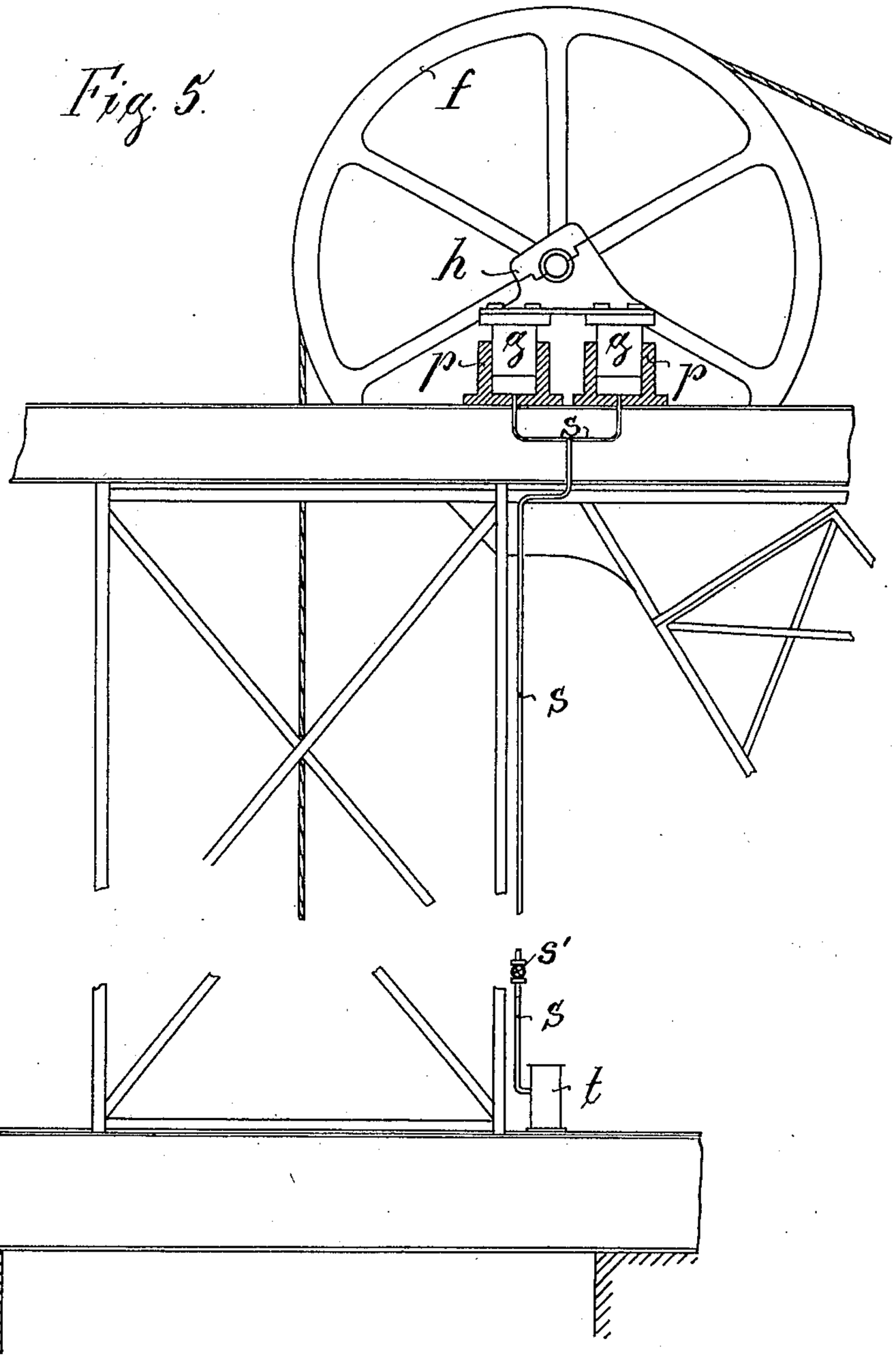
5 SHEETS—SHEET 3.

Fig. 5.



Witnesses:
Arthur Scholz
Paul Hinkelmann.

Inventor:
Karl Teichmann
by Rosenbeißer
Attorney

K. TEICHMANN.

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5 SHEETS—SHEET 4.

Fig. 6

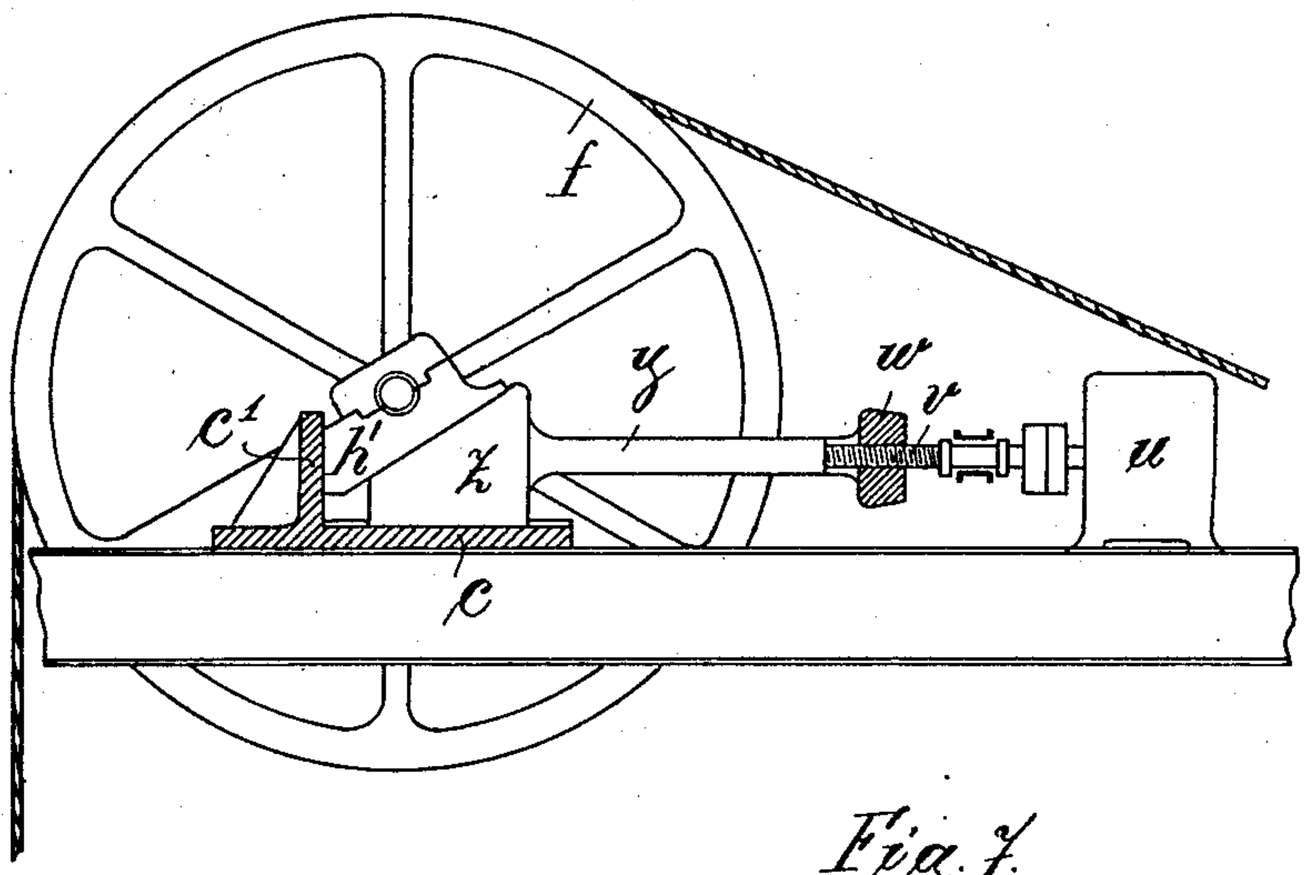
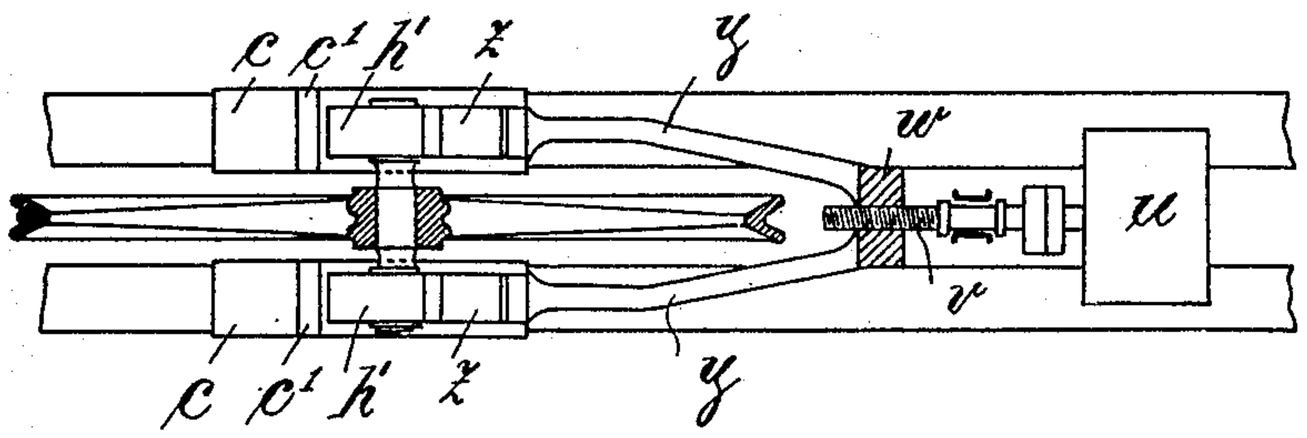


Fig. 7.



Witnesses:
Arthur Scholz
Paul Hinkelmann.

Inventor:
Karl Teichmann
by Robert Bäßler
Attorney

K. TEICHMANN.

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5 SHEETS—SHEET 5.

Fig. 8.

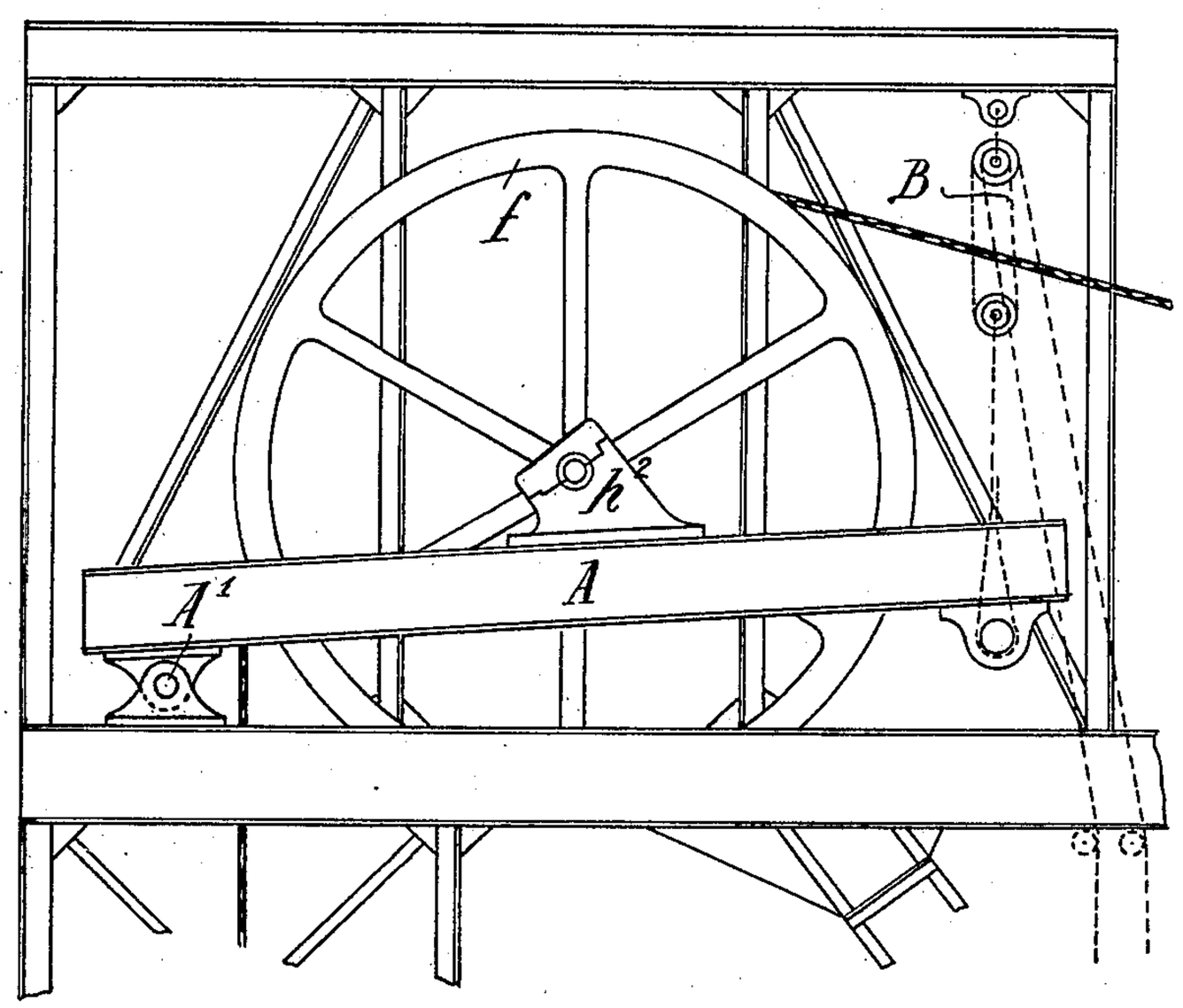
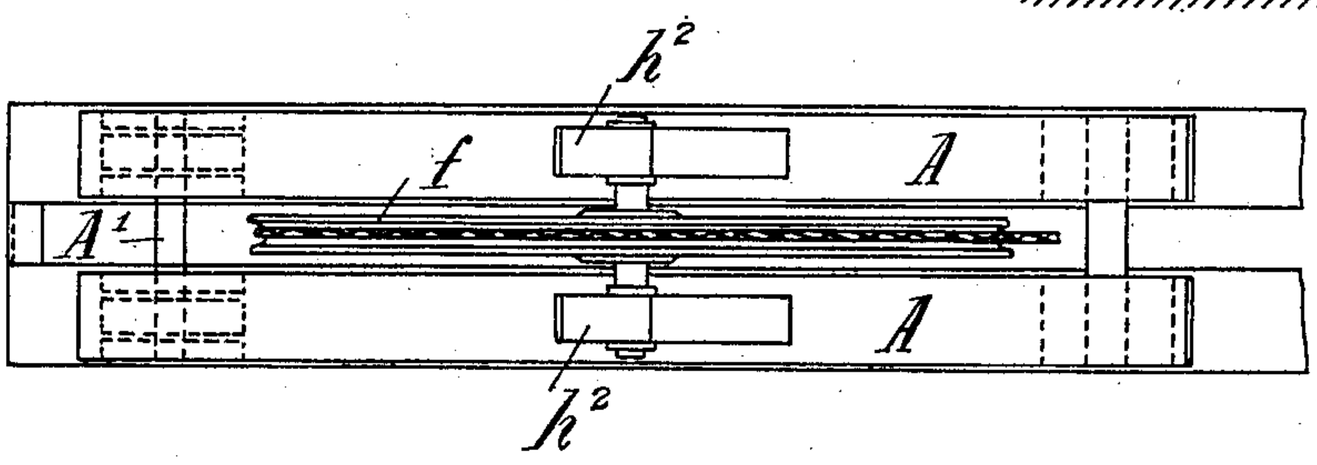


Fig. 9.



Witnesses:
Arthur Scholz
Paul Hinkelmann.

Inventor:
Karl Teichmann
by Rosenstiehler
Attorney

UNITED STATES PATENT OFFICE.

KARL TEICHMANN, OF SALZDETFURTH, NEAR HILDESHEIM, GERMANY.

ELEVATING APPLIANCE FOR USE IN MINES AND THE LIKE.

No. 919,492. Specification of Letters Patent. Patented April 27, 1909.

Application filed December 28, 1907. Serial No. 408,365.

To all whom it may concern:

Be it known that I, KARL TEICHMANN, engineer, a subject of the King of Würtemberg, and resident of Salzdetfurth, near Hildesheim, German Empire, have invented certain new and useful Improvements in Elevating Appliances for Use in Mines and the Like, of which the following is an exact specification.

This invention relates to the elevating appliances used in mines and the like. In such elevating appliances it is customary to pass the elevating rope or ropes from the winding engines over a number of pulleys mounted on an elevated platform. In such arrangements it has been necessary to effect the adjustment of the height or depth to which the cage, bogie or other receptacle or article was to be raised or lowered by means of the winding engine. This adjustment has proved exceedingly difficult in the case of deep shafts where long cables are necessarily employed. Thus the stretching of the cable under various loads could not be judged by the operator at the winding engine, and considerable delay was sometimes caused by the difficulty of bringing the cage or the like to a stand-still in exactly the correct position.

The object of this invention is to provide means for enabling this exact adjustment to be effected without employing the winding engine.

To this end the invention consists in providing the elevated pulleys over which the rope or ropes pass with means for moving the same as desired to effect the required fine adjustment. It is also preferable to provide means for controlling the elevating or lowering of the pulleys from a distance.

In carrying this invention into effect any convenient means may be employed for raising or lowering the elevated pulleys over which the ropes pass.

Referring now to the accompanying drawings Figure 1 is an end view and Fig. 2 is a diagrammatic side view of an elevating plant for use in mines according to this invention, Figs. 3 and 4 are views similar to Figs. 1 and 2 showing the range of control by means of the movable pulleys, Fig. 5 is an enlarged detail of the hydraulic device which I may employ for raising and lowering the pulleys, Fig. 6 is an elevation and Fig. 7 is a plan of a device for raising the block by means of a wedge, Fig. 8 is an elevation and Fig. 9 is a plan of a device for raising or lowering the pulley by means of a pivoted girder.

In carrying the invention into effect according to the form illustrated in Figs. 1–4 the ropes pass from the winding engine *a* over pulleys *f* and *f'* supported on an upper platform. The pulleys are journaled in brackets *h* supported on elevating devices *k* and *k'* hereinafter more fully described with reference to Fig. 5. The ropes connect with cages or bogies *b* and *b'* which are moved between the ground level *d* and various platforms in the mine such as *e*. By means of the winding engine *a* the cage *b'* for example is lowered to the position shown in the lower part of Fig. 2 that is to distance *n* from the level of the platform *e*. By bringing the device *k'* into operation the pulley *f'* is moved downward through a distance which is approximately $\frac{n}{2}$, if the rope is assumed to descend practically vertically from the elevated pulleys to the winding engine. In this way the cage or bogie *b'* is brought to the level of the platform *e*. Meanwhile the bogie or cage *b* has by means of the winding engine been brought into the position shown in Fig. 1, that is to say, at a distance *m* from the ground level *d*, the pulley raising device *k* is then brought into operation to raise the pulley *f* through a distance $\frac{m}{2}$ by which means the bogie *b* is brought to the level of the ground *d* as shown in Fig. 3.

In carrying this invention into effect according to the particular form shown in Fig. 5 the raising of the pulleys *f* and *f'* is effected by hydraulic means, that is to say, the pulley *f* is journaled in the block *h* which is supported by means of hydraulic cylinders *p p* to which there lead pipes *s* from a pump *t*. The pipes *s* are provided with cocks such as *s'* placed about or near the level of the ground *d* or the various platforms *e* in the mine. In the form shown adjustment of the height of the pulleys *f*, *f'* is effected by operating the pump *t* at the landing stage of the cage. In Fig. 5 the device is illustrated in side view and it will of course be understood that two hydraulic cylinders *p* and corresponding rams *g* are also provided on the other side of the pulley *f* as indicated in the diagrammatic Figs. 1 and 3.

According to the example shown in Figs. 6 and 7 I employ an electric motor for effecting the raising of the pulleys *f* and *f'*. It will be

understood, however, that any convenient motor may be employed. According to the form shown in Figs. 6 and 7 the blocks h' in which the pulleys are journaled rest in an inclined position on wedges z connected by rods y with a nut w. With this nut there engages a screwed rod v, adapted to be turned by means of the electric motor u. The wedges z rest on plates c provided with angle plates c' against which the blocks h' rest. It will be seen that by these means when the motor u is rotated in one or the other direction the wedge blocks z are moved toward or away from the plate c' and the raising and lowering of the bearing blocks h' is effected. In this case the motor u is controlled by switches placed at the desired positions.

According to the form of this invention shown in Figs. 8 and 9 the bearing blocks h^2 are mounted on girders A pivoted at A'. These girders A are adapted to be raised and lowered by means of a block and tackle B, the operating chain of which is carried to the various parts at which it is necessary to effect the adjustment of the cage.

I claim:—

1. An elevator for use in mines and the like having in combination with elevated pulleys, a carrying cable passing over said pulleys and a winding engine, a cage carried by the cable and means for bringing said cage to a stand still at the correct position independently of the winding engine comprising bearings for the elevated pulleys and means for moving said bearings up or down as required.

2. An elevator for use in mines and the like having in combination with elevated pulleys, a carrying cable passing over said pulleys and a winding engine, a cage carried by the cable and means for bringing said cage to a stand still at the correct position independently of the winding engine comprising bearings for the elevated pulleys and means operable from the landing point of the cage for moving said bearings up or down as required.

3. An elevator for use in mines and the like having in combination with elevated pulleys, a carrying cable passing over said pulleys and a winding engine, a cage carried by the cable and means for bringing said cage to a stand still at the correct position independently of the winding engine comprising bearings for the elevated pulleys, hydraulic rams supporting said bearings and means for supplying operating fluid to said rams from the landing point of the cage.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

KARL TEICHMANN.

Witnesses:
M. L. THOMPSON,
ROBERT V. BÜLERD.