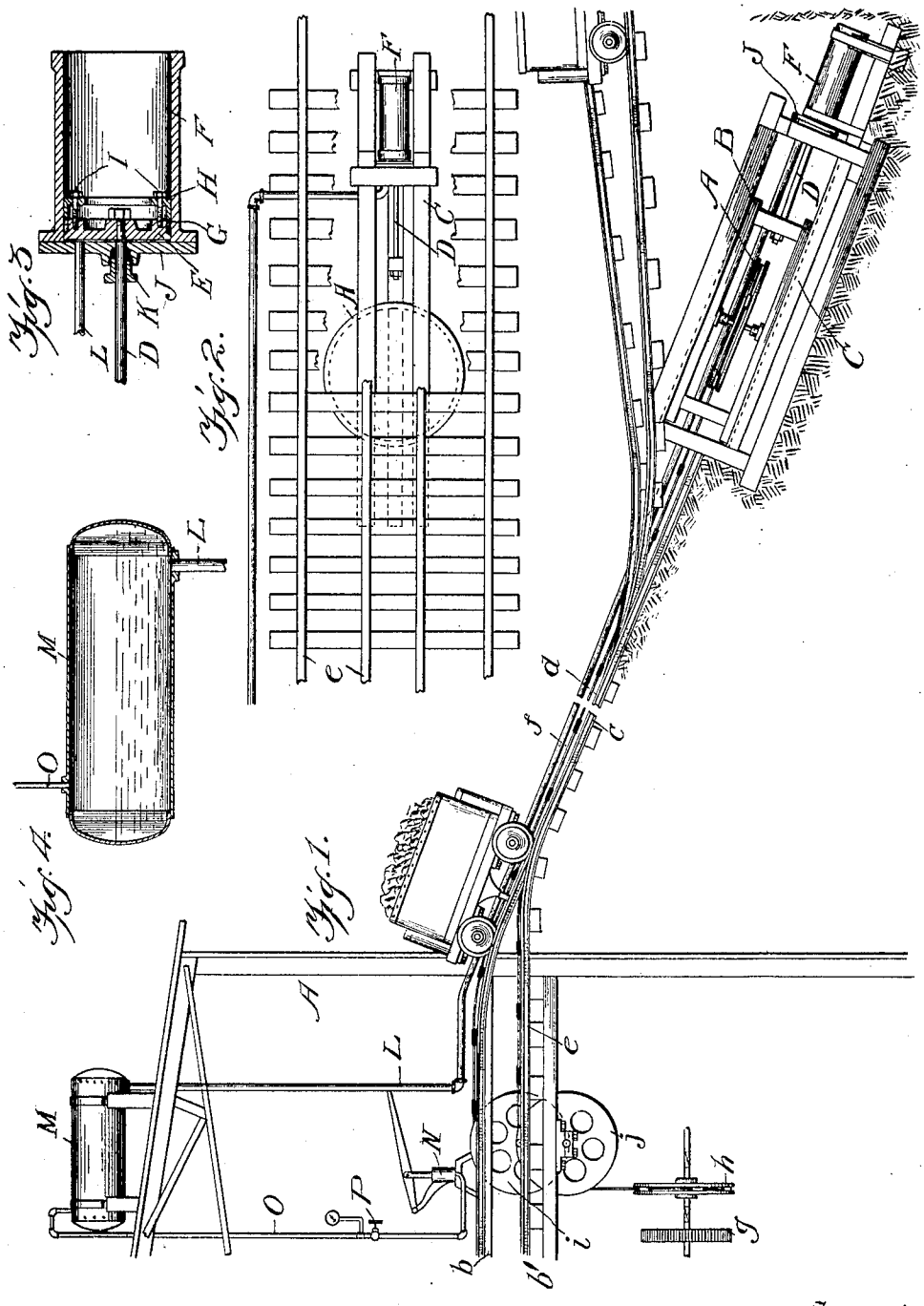
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M. HIBBARD.

TENSION DEVICE FOR CABLE CAR HAULS.

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TENSION DEVICE FOR CABLE-CAR HAULS.

No. 888,439. Specification of Letters Patent. Patented May 19, 1908.

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To all whom it may concern:

Be it known that I, MERRILL HIBBARD, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Tension Devices for Cable-Car Hauls, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in cable car hauls and similar apparatus wherein use is made of long sections of wire cable. Generally these cables are heavy and move continuously. It has been found necessary to use some sort of a "take-up" device so that the cable will always be maintained under uniform tension. Not only does the load upon such a cable frequently vary, more or less, but the length varies from time to time because of a stretch in the fibers or wires of which it is composed and because of variations in temperature and moisture. The take-up device generally employed for this purpose comprises a frame or holder in which is supported one of the sheaves or guide wheels of the cable, this frame being adjustable toward and from the normal path of the cable. Tension is ordinarily exerted on this frame either by means of one or more screws or by means of sufficiently heavy weights free to travel vertically and acting through a rope, cable or chain, passing over a pulley. In those systems where use is made of adjusting screws the personal attention of an operative is required to vary the tension to meet the varying conditions; and consequently devices of this kind are troublesome and inferior to the apparatus which is automatic in its action. A system of the other class requires for the proper action of the weight a well or shaft below the ground or a special chamber when arranged above the ground.

The object of this invention is to provide a tension take-up mechanism which shall be automatic and of such character that it will require but limited space and can be arranged above ground, obviating the necessity of any special chamber or well to receive it.

In the drawings, Figure 1 is a view of an apparatus embodying my improvements, some of the parts being shown in elevation and some in vertical section, it being more or less conventional in character. Fig. 2 is a plan view, also more or less conventional, showing the tail end or lower end of the apparatus. Fig. 3 is a section through the cylinder and piston. Fig. 4 is a section through the fluid reservoir.

In the drawings, I have indicated enough of the parts of a wire rope haulage system to illustrate one method of carrying out my invention. The apparatus here presented is adapted for elevating loaded mine cars from the mouth of the mine or from points adjacent thereto, to the platform of the tipple-house where the coal or other material is discharged over the screens to the cars below.

a indicates the frame structure of the tipple-house, it having floors or platforms at *b*—*b'*. At *c* is shown the inclined way upon which are arranged the car tracks, the track at *d* being that over which the loaded cars move as they travel upward and that at *e* being the one upon which they return downward.

It will be understood that in an apparatus of the kind indicated in the drawings the loaded cars that pass up the inclined way at *d* are first received upon the platform or floor *b;* that after the loads have been discharged from the cars the latter are permitted to move forward, under the action of gravity, to a switch which guides them to the platform *b'*, and that from this they move downward over the track *e* to the place from which they are again taken into the mine. It will be understood however that the parts more particularly constituting the improvements herein presented can be combined with haulage systems of other sorts, and therefore the details of the one here indicated need not be fully illustrated or described.

The cars are positively hauled upward, and are controlled in their descent, by an endless chain, wire rope or cable *f*. Here, too, there can be many modifications, as chain hauls or rope hauls of numerous forms are well known for this, and similar purposes.

As illustrated, the cable or chain is actuated by the power devices at *g*, these including the drive sheave *h* to which the cable comes from the wheel *i* at the upper end of the up-run and from which it goes to the rope wheel *j* at the upper end of the down-run.

At the lower end of the apparatus is situated the take-up mechanism. This, in the structure shown comprises the sheave A mounted in the frame B, which slides in a holding and guiding frame, C, rigidly fastened in place.

F indicates a cylinder mounted at a suitable place adjacent to the frame B. This cylinder is closed at one end by a head J, the other end being left open. In the cylinder is the piston E, which preferably is of a diameter such that the piston will be somewhat loose in the cylinder but there is a tight fit provided by the packing G held tightly in place by the gland H which is drawn snugly to place by the stud-screws I. The packing is formed of hemp or similar fibrous material.

D is the piston rod which passes through the head J and is secured to the piston E, the rod being tightly packed by the stuffing box K.

L is a pipe extending from the head J to the tank M. This tank carries a store of suitable fluid, such as oil, which can be carried through the pipe L to the space in the cylinder F between the piston E and the head J. To get the proper fluid pressure from the tank it may be either located at such an elevation as to cause the desired pressure in the cylinder or it may have combined with it a pressure apparatus such as an air pump. Or both these plans can be followed. As shown in the drawings, this tank M is arranged upon a super-structure extending above the platforms *b*—*b'*. To increase the pressure resulting from the elevated position of the tank there are shown as combined with it an air pump at N with the connecting pipe O provided with valve P and a pressure gage. The pump N can be of simple character and adapted to be operated by hand so that the attendant at the tipple can at any time increase the pressure as found necessary. After storing sufficient air in the tank N the valve P should be closed.

By combining with the volume of liquid a body of air under pressure not only will the efficiency of the fluid be increased in its action on the piston but, because of the elasticity of the air, compensation is made for fluctuations in pressure which thus may be held within any required limits.

The hydraulic cylinder F may be placed above the slide frame B and the sheave A, in which case the tendency will be for the frame to be pushed instead of pulled. When so arranged the piston rod will be reversed in the piston, the head J will be tight and the piston rod will project through the open end of the cylinder.

It will be seen that with a tension take-up apparatus of this sort, I avoid the necessity of providing a well or shaft for the weight which is required when the common form of automatic take-up is employed, and also avoid the necessity for the constant supervision of an attendant which is required when adjusting screws or threaded rods are employed such as are used in some forms of cable take-up.

What I claim is:

1. In a take-up mechanism for a cable haul, the combination with a bodily movable cable sheave or guide, and a movable holder therefor, of a cylinder, a piston therein connected with the movable holder, and means for supplying fluid pressure constantly in the cylinder against the piston, substantially as set forth.

2. In a take-up mechanism for a cable haul, the combination with a cable support or guide, and a movable holder therefor, of a cylinder, a piston therein connected with said movable holder, a tank adapted to contain a body of fluid and communicating with the interior of the cylinder whereby pressure can be constantly transmitted from the tank, to the piston, substantially as set forth.

3. In a take-up mechanism for a cable haul, the combination with a cable support adapted to move toward and from the normal path of the cable, of a cylinder, a piston therein connected with the cable support, and means for constantly supplying a pressure agent to the said cylinder against the piston.

4. In a take-up mechanism for a cable haul, the combination with a cable support or guide, and a movable holder therefor, of a cylinder, a piston therein connected with the said movable holder, an elevated fluid tank, and a duct extending from the tank to the cylinder, substantially as set forth.

5. In a take-up mechanism for a cable haul, the combination with a cable support, and a holder therefor adapted to bodily move by the cable, of a cylinder, a piston therein connected with the holder, a fluid receptacle, a duct connecting said receptacle with the interior of the cylinder, and means for increasing at will the pressure exerted by the fluid in the cylinder, substantially as set forth.

6. In a take-up mechanism for a cable haul, the combination with the cable guide and a movable holder for said guide adapted to be moved by the cable, of a cylinder, a piston therein connected with the holder, the elevated fluid receptacle, the duct connecting the fluid receptacle with the cylinder and the pump for storing air under pressure, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

MERRILL HIBBARD.

Witnesses:

F. H. CHURCH,

E. E. ROCKFIELD.