H. L. TURNEY & H. A. KALB.

PNEUMATIC SNUBBING MEANS.

APPLICATION FILED APR. 3, 1912.

1,051,291.

Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.

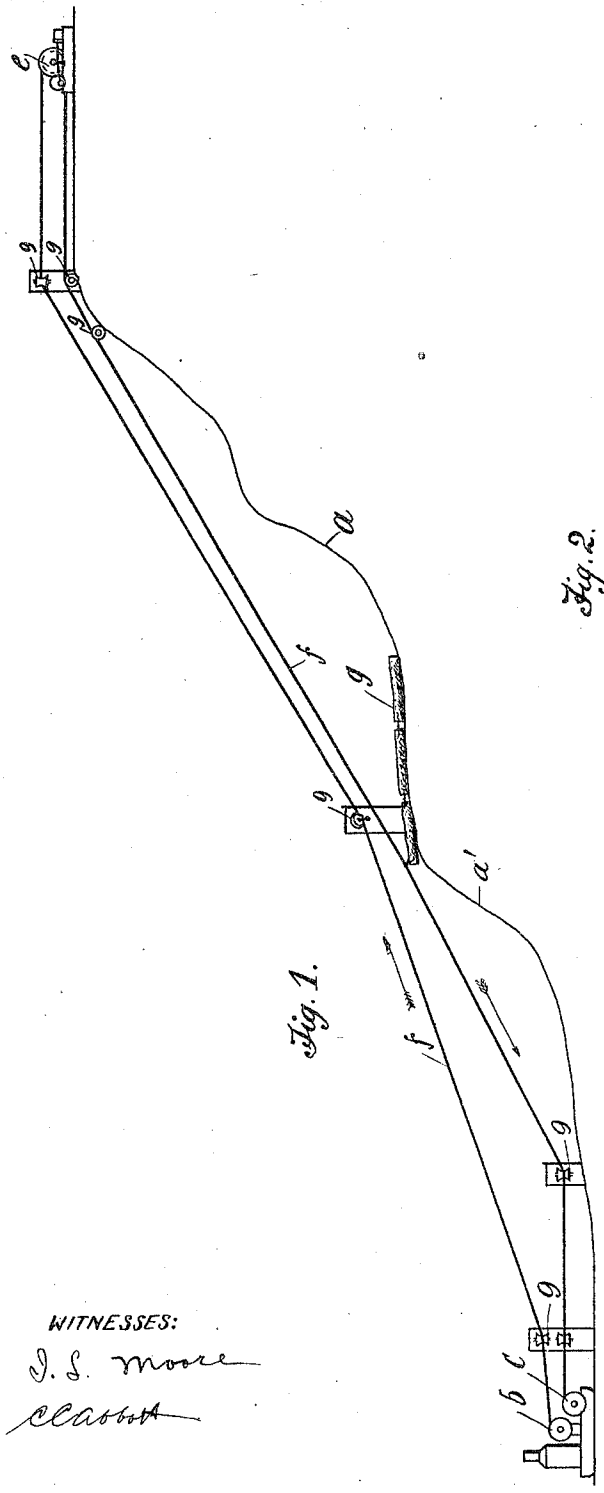

Fig. 1.

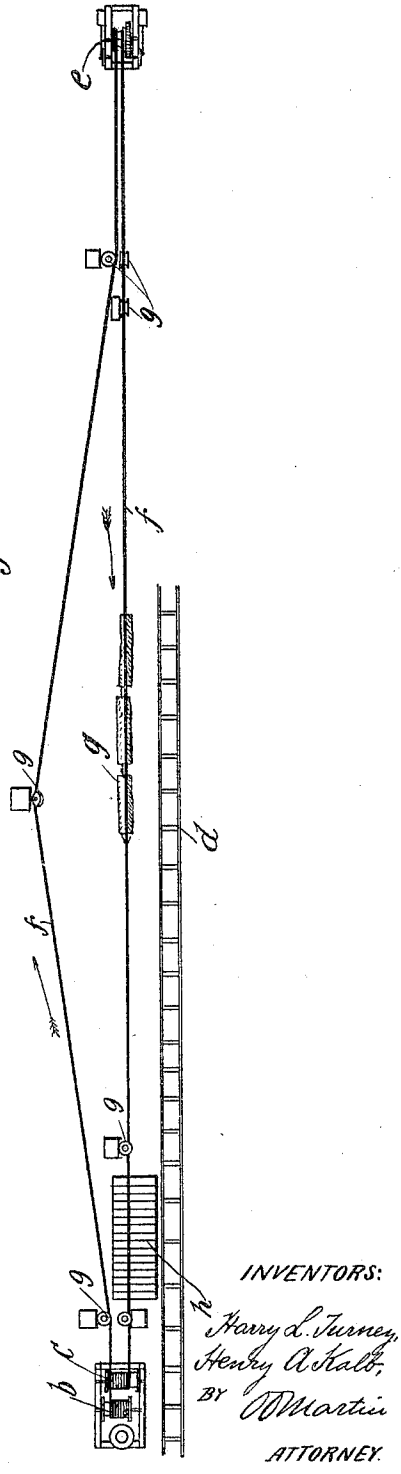

Fig. 2.

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Fig. 3.

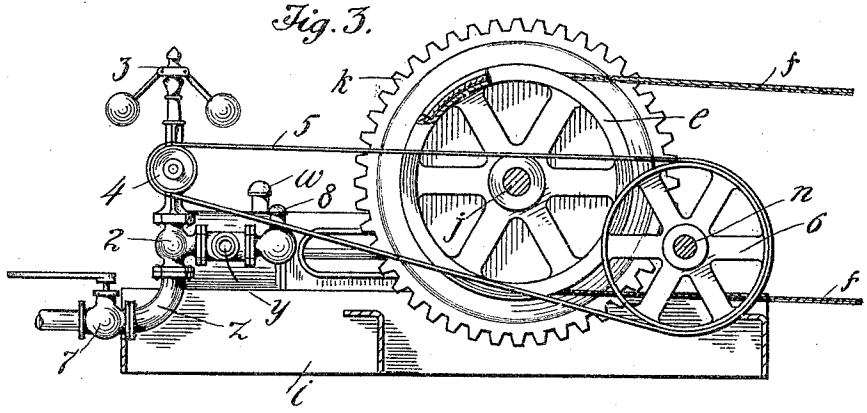
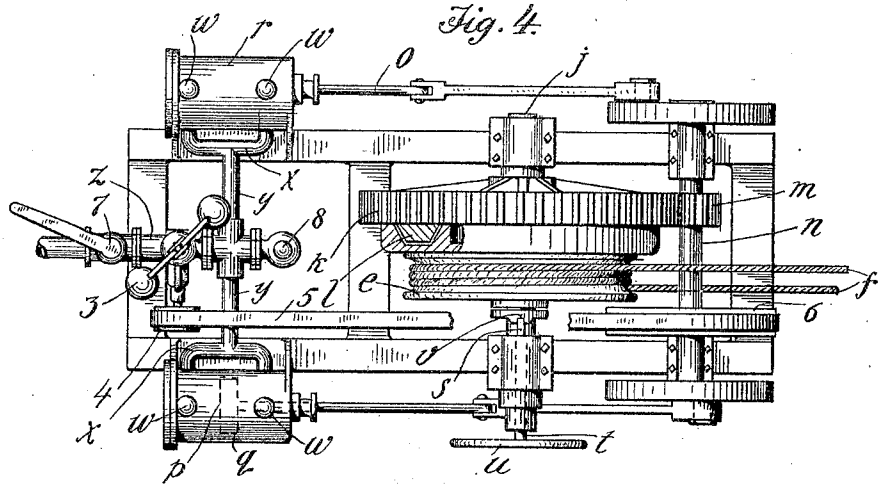


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY L. TURNEY, OF PORTLAND, OREGON, AND HENRY A. KALB, OF RAYMOND, WASHINGTON.

PNEUMATIC SNUBBING MEANS.

1,051,291. Specification of Letters Patent. Patented Jan. 21, 1913.

Application filed April 3, 1912. Serial No. 688,301.

To all whom it may concern:

Be it known that we, HARRY L. TURNEY and HENRY A. KALB, citizens of the United States, residing at Portland, in the county of Multnomah and State of Oregon, and Raymond, in the county of Pacific and State of Washington, respectively, have invented certain new and useful Improvements in Pneumatic Snubbing Means, of which the following is a specification.

Our invention relates to logging machinery and has particular reference to means for controlling the lowering or snubbing of logs from an elevated yarding station to a loading station on level with the track of a logging train.

Logging operations are usually performed in mountainous districts, in which steep terraced or broken hills are encountered, and the problem of lowering logs over the slopes of such hills is generally difficult. In some instances a track for a logging train is laid along steep winding grades to the top of a slope, but this construction is very expensive and necessitates the employment of powerful engines. A less expensive manner is to lay the track as nearly as possible on a level, as a rule along creeks or rivers, and to run cable-ways to the top of the slopes. A hoisting engine is placed in close proximity to said track, and from the drums of said engine extend cables to a drum-mechanism above. The logs to be lowered are attached to one of said cables, which is operated by said engine to drag said logs to the loading station.

The object of our invention is to provide means, coöperative with said drum-mechanism, for automatically governing the speed of the cables during the descent of the attached logs.

A further object is to simplify and improve the cable-mechanism itself by eliminating extra return cables and by introducing supporting and guiding means adapted to prevent the cables from becoming entangled.

Our invention furthermore consists in the combinations and features fully set forth in the following description and illustrated in the appended drawings, of which:

Figure 1 illustrates, in simple diagrammatic outline, the general arrangement of our device, Fig. 2 is a diagrammatic plan view substantially in agreement with Fig. 1, Fig. 3 shows, in side elevation, the speed controlling mechanism of our device, and Fig. 4 is a plan view in agreement with Fig. 3.

Referring in the first instance to Fig. 1, *a* represents the contour of a hillside, at the bottom of which the drums *b*, *c* of a suitable hoisting engine are positioned in close proximity to a railroad track, indicated by lines *d*. The controlling mechanism, which will be fully described later, is in this view and in Fig. 2 indicated by sheave *e*. A cable *f* has one end fixed on drum *b*, from which it extends to sheave *e*. It makes a few turns around said sheave and returns to drum *c*. The logs *g* are in any convenient, well known manner attached to the cable, and are supposed to be on their downward journey to loading station *h*. Suitable guide-rollers 9 are mounted to support the cable at intervals.

The controlling mechanism of our invention is constructed in the following manner. On a base *i* is journaled a shaft *j*, on which is rigidly mounted a large gear wheel *k*, while the above mentioned sheave *e* is journaled for independent rotation on the said shaft. Gear wheel *k* meshes with a gear pinion *m*, rigid on a crank shaft *n*, and the latter is through the medium of piston rods *o* and pistons *p* operatively connected with air-cylinders *q*, *r*. A clutch-mechanism *l* of any suitable and well known construction is interposed between gear *k* and sheave *e*. For throwing said sheave into operative connection with the shaft and gear *k*, a well known mechanism is indicated in Fig. 4. A key or pin *s* is mounted in the shaft for engagement with a notch of a collar *v*, and said pin is manually operated by means of screw rod *t* and handle *u* to force the sheave and gear-clutch into engagement.

When the sheave and gear are interconnected and revolving, pistons *p* are caused to reciprocate in cylinders *q*, *r*. A series of check valves *w* permit air to enter said cylinders, and the air thus drawn into the cylinders is exhausted through pipes *x*, *y*, *z* and into the atmosphere. A valve 2 is interposed between pipes *y* and *z* and the opening and closing of this valve is controlled by a governor 3, which by pulleys 4, 6 and belt 5 is positively driven from crank shaft *n*.

When the machine runs at low speed, valve 2 remains open and the pistons re-

ciprocate freely in the cylinders, but as the speed of the machine increases, said valve gradually closes, thus causing the air drawn into the cylinders to become more and more compressed, and to oppose the motion of the pistons proportionally. By closing valve 7 of exhaust pipe *z* the escapement of air is entirely cut off, and the movement of the pistons stopped. A safety valve 8 may conveniently be introduced, and adjusted to blow off at a predetermined degree of compression, so as to prevent injury to the machinery due to a too severe strain.

The operation of our device is as follows: As shown in Fig. 1, the logs *g* are on their downward journey, and are at the moment passing a comparatively level spot, over which they are dragged by the hoisting engine, indicated by drums *b*, *c*. The instant the logs reach the steep incline *a'*, they will practically drop by gravity, and their weight pulling on the cable will instantly tend to increase the velocity of the entire device. But the governor 3, see Figs. 3, 4, speeds up simultaneously, thereby cutting down the exhaust and retarding the motion of the controlling mechanism. In other words, our device is perfectly balanced, and the governor is adjusted according to the weight of the load. If it is desired to stop the movement of the logs at any point for a space of time, valve 7 is closed, and if, through accident, the strain on the machinery becomes so great, that there is danger of the cable parting or the machinery giving out, the safety valve 8, being adjusted for such emergency, will open and relieve the tension. When the logs, on reaching the loading station *h*, are detached, the motion of the engine is reversed and the cable returned to its initial position. During this reverse motion sheave *e* is disconnected from gear *k* by turning handle *u*, thus permitting said sheave to run idle and the entire controlling mechanism to remain stationary.

It is important to note, that we employ only one cable, and as the forward and return ends of said cable are guided and kept separated by means of the rollers *l*, we not only provide the simplest mechanism to be conceived of, but we also successfully prevent the cables from becoming entangled, which is impossible where more than one cable is used. Furthermore, that the cable remains taut during the entire snubbing operation and that the load carrying strand of the cable extends in a straight, direct line from the controller sheave to the hoisting engine.

We claim:

1. In a snubbing device, the combination with the two drums of a hauling engine; of a pneumatic means for controlling the speed of the device; and a single hauling cable having one end fixed on one of said drums, from which it extends to a sheave of said controlling means, making a few turns around said sheave and thereupon returning to the second drum of said hoisting engine.

2. In a snubbing device, the combination with the two drums of a hauling engine; of pneumatic means for controlling the speed of the device; a single hauling cable having one end fixed on one of said drums, from which it extends to a sheave of said controlling means, making a few turns around said sheave and thereupon returning to the second drum of said hoisting engine; and a series of guide rollers directing and separating the two ends of said cable.

3. In a snubbing device, the combination with the two drums of a hauling engine; of a pneumatic speed controlling means; a single hauling cable having one end fixed on one of said drums, from which it extends to a sheave of said controlling means, making a few turns around said sheave and thereupon returning to the second drum of said hoisting engine; said speed controlling means including air cylinders positively operated by said sheave, a governor for controlling the flow of air through said cylinders and means for operatively disconnecting said cylinders from said sheave.

4. In a snubbing device, the combination with the two drums of a hauling engine; of a pneumatic speed controlling means; a single hauling cable having one end fixed on one of said drums, from which it extends to a sheave of said controlling means, making a few turns around said sheave and thereupon returning to the second drum of said hoisting engine; said speed controlling means including air cylinders positively operated by said sheave, a governor for controlling the flow of air through said cylinders, means for operatively disconnecting said cylinders from said sheave, a valve for entirely cutting off the flow of air and a safety valve adjusted to blow off at a predetermined degree of compression.

5. In a snubbing device, the combination with the two drums of a hauling engine; of a pneumatic speed controlling means; a single hauling cable having one end fixed on one of said drums, from which it extends to a sheave of said controlling means, making a few turns around said sheave and thereupon returning to the second drum of said hoisting engine; said speed controlling means including air cylinders positively operated by said sheave, a governor for controlling the flow of air through said cylinders, means for operatively disconnecting said cylinders from said sheave, a valve for entirely cutting off the flow of air and a safety valve adjusted to blow off at a predetermined degree of compression; and a

series of guide rollers directing and separating the two ends of said cable.

6. In a snubbing device, the combination with the two drums of a hauling engine; of a pneumatic speed controlling means; said speed controlling means comprising a cable sheave, a gear wheel, manually operated means for operatively connecting and disconnecting said sheave and gear, a pinion driven by said gear and fixed on a crankshaft, air cylinders, pistons operated by said crankshaft to reciprocate in said cylinders, intake valves in said cylinders, exhaust pipes leading from said cylinders, a governor operatively connected with said crankshaft and controlling the flow of air through said cylinders, a valve for entirely cutting off the flow of air and a safety valve adjusted to blow off at a predetermined degree of compression; a hauling cable extending from one of said engine drums, making a few turns around said sheave and returning to the other engine drum; and a series of guide rollers directing and separating the two ends of said cable.

In testimony whereof, we have hereunto affixed our signatures in the presence of two witnesses.

HARRY L. TURNEY.
HENRY A. KALB.

Witnesses:
ETHYLE THORPE,
OZRO LATSHAW.