C. P. ROSS.

AUTOMATIC TRACTION HOIST.

APPLICATION FILED JULY 24, 1919.

1,352,632.

Patented Sept. 14, 1920.

2 SHEETS—SHEET 1.

Fig. 2.

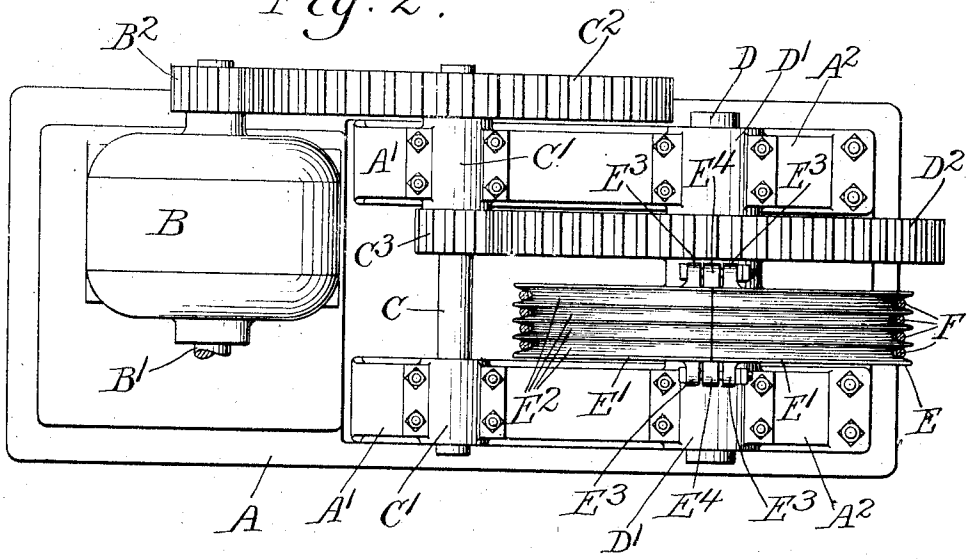
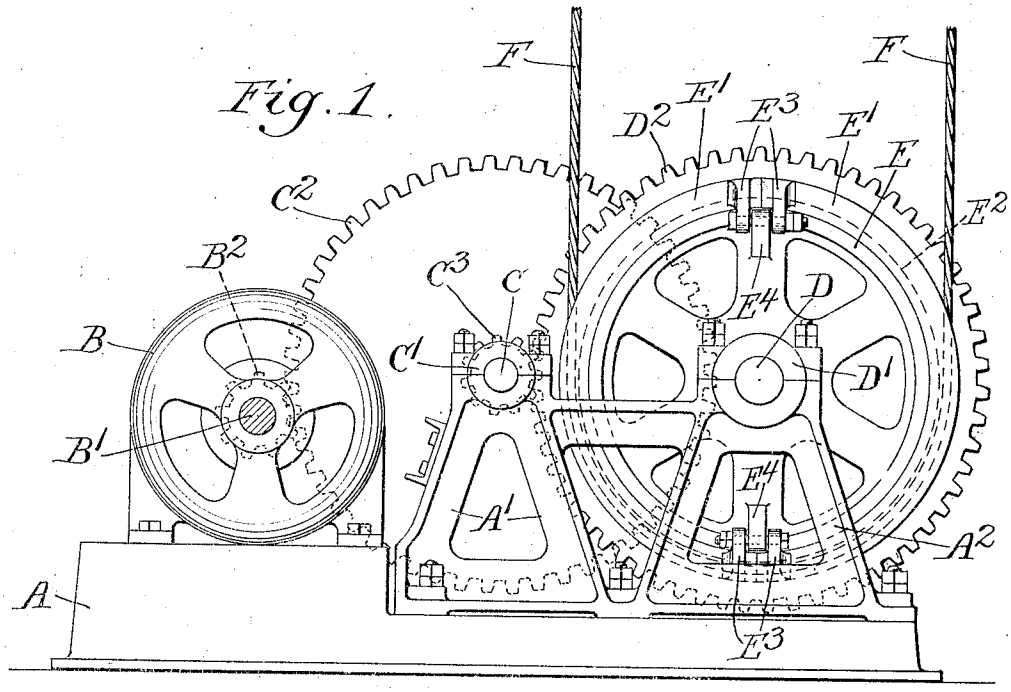


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 4.

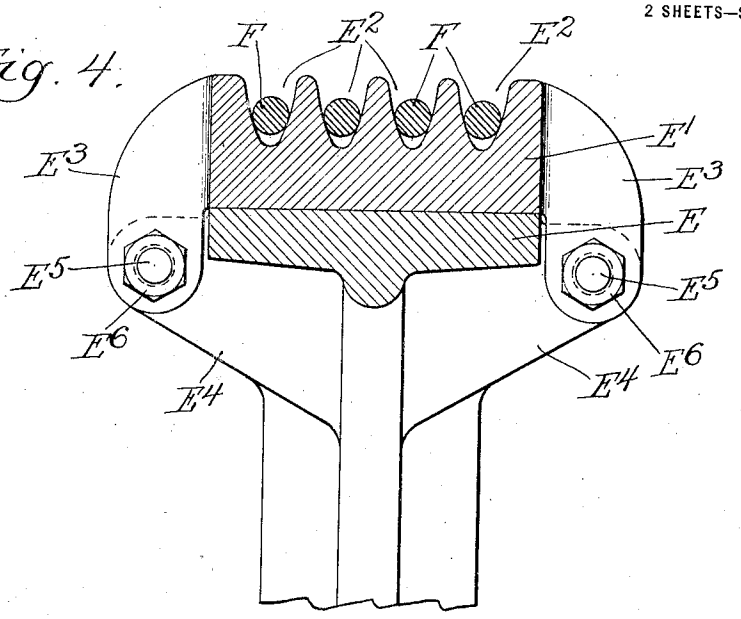
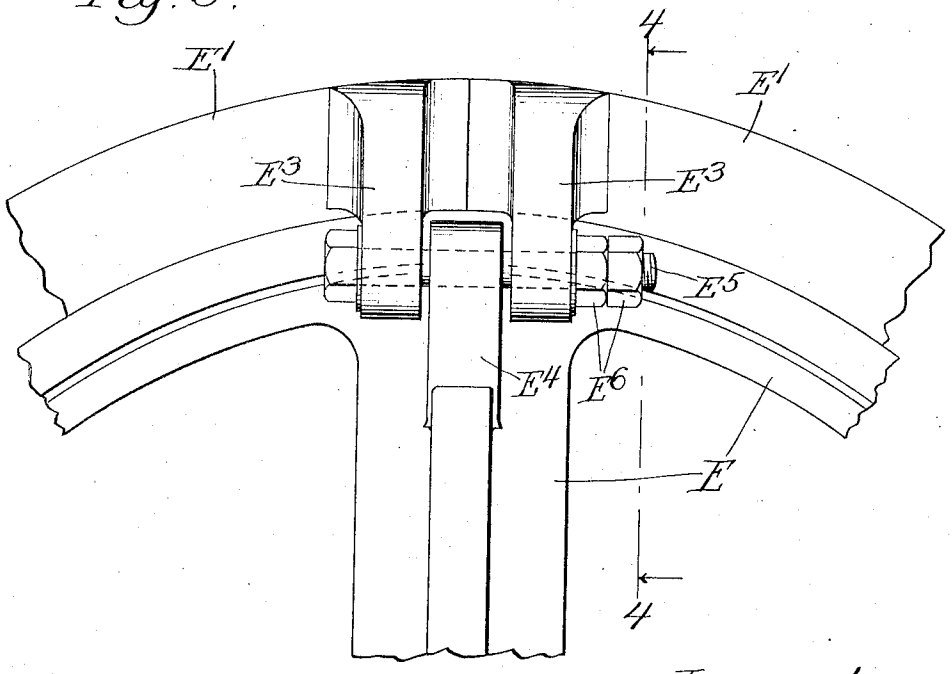


Fig. 3.



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UNITED STATES PATENT OFFICE.

CLYDE P. ROSS, OF KENILWORTH, ILLINOIS, ASSIGNOR TO ROBERTS & SCHAEFER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC TRACTION-HOIST.

1,352,632. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed July 24, 1919. Serial No. 312,979.

To all whom it may concern:

Be it known that I, CLYDE P. ROSS, a citizen of United States, residing at Kenilworth, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Automatic Electric Traction-Hoists, of which the following is a specification.

My invention relates to an improvement in automatic traction coal hoists and has for a general object the prevention of overwinding of such hoists when the carriage reaches its limit. This object I obtain by the application to a coal handling plant, of a drum operating on the traction principle, passing the hoisting cable under the hoisting drum, and maintaining this traction on the drum by means of a counterweight or second carriage attached to the end of the cable. When the counterweight grounds, the cable slacks the traction is reduced, the cable slides on the hoisting drum and the carriage ceases to move. Another object is the provision of a removable tire for the hoising drum, which may be easily removed when worn out without removing the cable or dismantling the hoist. Other objects will appear from time to time in the specification.

I illustrate my invention diagrammatically in the following drawings wherein.

Figure 1 is a side elevation of my hoist;

Fig. 2 is a plan view of my hoist;

Fig. 3 is a detail of the hoisting drum on an enlarged scale;

Fig. 4 is a section on lines 4—4 of Fig. 3;

Like parts are represented by like characters in all the figures.

A is an integral base plate on which the hoisting machine is mounted. It carries secured to it the connected supporting frames A^1, A^2 and adjacent them, secured to the base, the motor B. The motor drives the motor shaft B^1 which carries keyed to it the pinion B^2. Mounted on the frame A^1 is the shaft C supported in the bearings C^1, C^1. It has keyed to it the gear C^2 in mesh with the pinion B^2. Intermediate the ends of the shaft is keyed the pinion C^3. Mounted on the frame A^2 is a shaft D which rotates in the bearings D^1, D^1. Keyed to it is the gear D^2 in mesh with the pinion C^3. Keyed to the same shaft is the hoisting drum E. This drum is provided with a removable tire preferably although not necessarily, constructed in two sections E^1 E^1. The periphery of the tire is surrounded by a plurality of deep V-shaped grooves E^2. The removable tire sections adjacent their meeting point one with another have laterally and inwardly extending lugs E^3, engaging, each pair between them, the lugs E^4 on the web of the hoisting drum. These lugs are all perforated to receive a bolt E^5 which passes through each pair of lugs on the removable rim and the lug on the drum web which lies between them. The bolts E^5 and nuts E^6 when locked in place firmly hold the assembly together. The lugs E^3 being offset toward the center of rotation of the drum, are adapted to prevent displacement of the tire sections on the drum. The cable F, one end of which is attached to the hoisting carriage and the other to the counterweight or to a second carriage, passes over pulleys not shown, and is looped around the hoisting drum engaging it about the lower half of its periphery. My hoisting drum is to be used with an automatic controller which determines the length of excursion of the cable, the length of its rest and automatic reverse. This controller is not illustrated, since it may be of a number of types and its details form no part of this invention.

It will, of course, be understood that this showing is largely diagrammatic and that while an operative device has been illustrated, many variations in shape, disposition of parts and in setting up of the system could be made without departing from the spirit of my invention, and for this reason I wish my drawings to be taken as largely diagrammatic.

The use and operation of my invention are as follows:

My hoisting drum is driven in any suitable way from driving means adjacent thereto. It is the usual practice in hoisting drums for heavy work such as in coaling plants for raising, lowering, or storing coal, to wind the cable about the drum and secure one end of it to the drum. There are many disadvantages to this method including the risk of overwinding, if the timing and limiting device, automatic or otherwise, fail to func-

tion. The result may be disastrous to the hoist. Such practice has, however, been universal in heavy hoisting and particularly in hoisting work for handling such heavy material as coal and the like, which is raised and lowered in great bulk and in continuous operation. I obviate the risks of this method, regardless of any control, automatic or manual, of the hoisting means, by applying to a heavy coal hoist the traction system. The hoisting cable is carried about the hoisting drum and engages it on only half of its periphery. Obviously, the hoisting drum may be placed at the top or at the bottom of the hoisting excursion, or anywhere else, depending on the arrangement of a cable and the needs of the particular installation. In any case, the cable will normally engage the hoisting drum about half or less of its periphery, and in the figures herein shown, the form wherein the cable engages the drum about the lower half of its periphery is illustrated.

When the hoisting carriage and the counterweight or second carriage are both hanging free, the tension on the cable is sufficient to compress it within the V-shaped slot and hold it against the drum with sufficient power to prevent its moving with relation to the periphery of the drum. When the drum is revolved the cable moves with it. When the counterweight or the carriage grounds, however, the tension on the cable is reduced and the whole cable is slacked. This so reduces the tension between the cable and the drum that the cable slides with relation to the drum and the drum is no longer able to hoist. Thus, no matter whether or not the rotation of the drum continues, the traction has ceased and the carriage remains stationary. Any possibility of overwinding is thus absolutely prevented. It is hardly necessary to emphasize the importance of such a provision for a coaling hoist where the weights handled are great and the damage which can be done by overwinding is enormous. To remove the rim of the drum of this hoist, all that is necessary is to rotate the drum to allow one of the segments to occupy that upper part of its periphery which is not engaged by the cable, then the operator removes the holding bolts and lifts the upper segment off and replaces it with a new one. Then the drum is rotated and the same process repeated with the other segment or segments. This prevents the necessity of unshipping the cable a complicated, long and expensive operation. It prevents the necessity of any dismounting of the machinery, and permits the whole operation to be performed with simplicity and despatch. When the drum surface wears out, the tire can thus be quickly and easily replaced by an unworn set of segments.

It will be understood that in a device such as this under constant heavy duty the need of easily removable segments is great because they frequently wear out when as here the traction system is used and in fact it would probably be commercially impossible to use the traction type of hoist without some such provision for readily renewing the drum face.

I claim:—

1. In a hoisting drum, a radially thin removable hoisting drum rim comprising a plurality of engaging rim sections and means for separately removing them.

2. In a hoisting drum a radially thin removable drum rim comprising a plurality of radially thin removable rim sections, said sections adapted to be removably secured to each other and to the drum.

3. The combination with a hoisting drum of a radially thin removable tire comprising a plurality of engaging tire segments and means adjacent their engagement with each other for securing them at the same time to each other and to the drum.

4. The combination with a hoisting drum of a removable tire comprising a plurality of engaging tire segments and means adjacent their engagement with each other for securing them at the same time to each other and to the drum, comprising lugs on the opposed ends of the tire segments in line with each other and lugs on the drum rim in line with and between said tire lugs, together with securing means for securing together each such set of lugs.

5. In a hoisting drum adapted for use with a hoisting cable, a removable rim and means for removing and replacing it without dismounting the cable from the drum.

6. In a hoisting drum adapted for use with a hoisting cable engaging the drum only about part of its periphery, a removable rim comprising a plurality of removable segments, each of said segments adapted to be removed and replaced in turn during the engagement by the belt of the other segments.

7. In a hoisting drum adapted for use with a hoisting cable engaging the drum substantially about the lower half of its periphery, a removable rim adapted to be removed without the dismounting of the cable from the drum, said rim comprising a plurality of removable segments each in turn adapted to be removed and replaced while lying on the upper periphery of the drum, the other segments being supported in place on the drum by the tension of the hoisting cable.

8. In a hoist adapted for the handling of heavy weights, a hoisting drum and means for driving it, a hoisting cable frictionally driven thereby and a radially thin removable drum rim comprising a plurality of removable rim sections.

9. In a hoist adapted for the handling of heavy weights, a hoisting drum and means for driving it, a cable frictionally driven thereby and a removable drum rim adapted to be removed from the drum and replaced without interrupting the frictional engagement of the cable with the drum.

In testimony whereof, I affix my signature in the presence of two witnesses this 21st day of July 1919.

CLYDE P. ROSS.

Witnesses:
AGNES C. JOHNSON,
EDITH L. PORTER.