

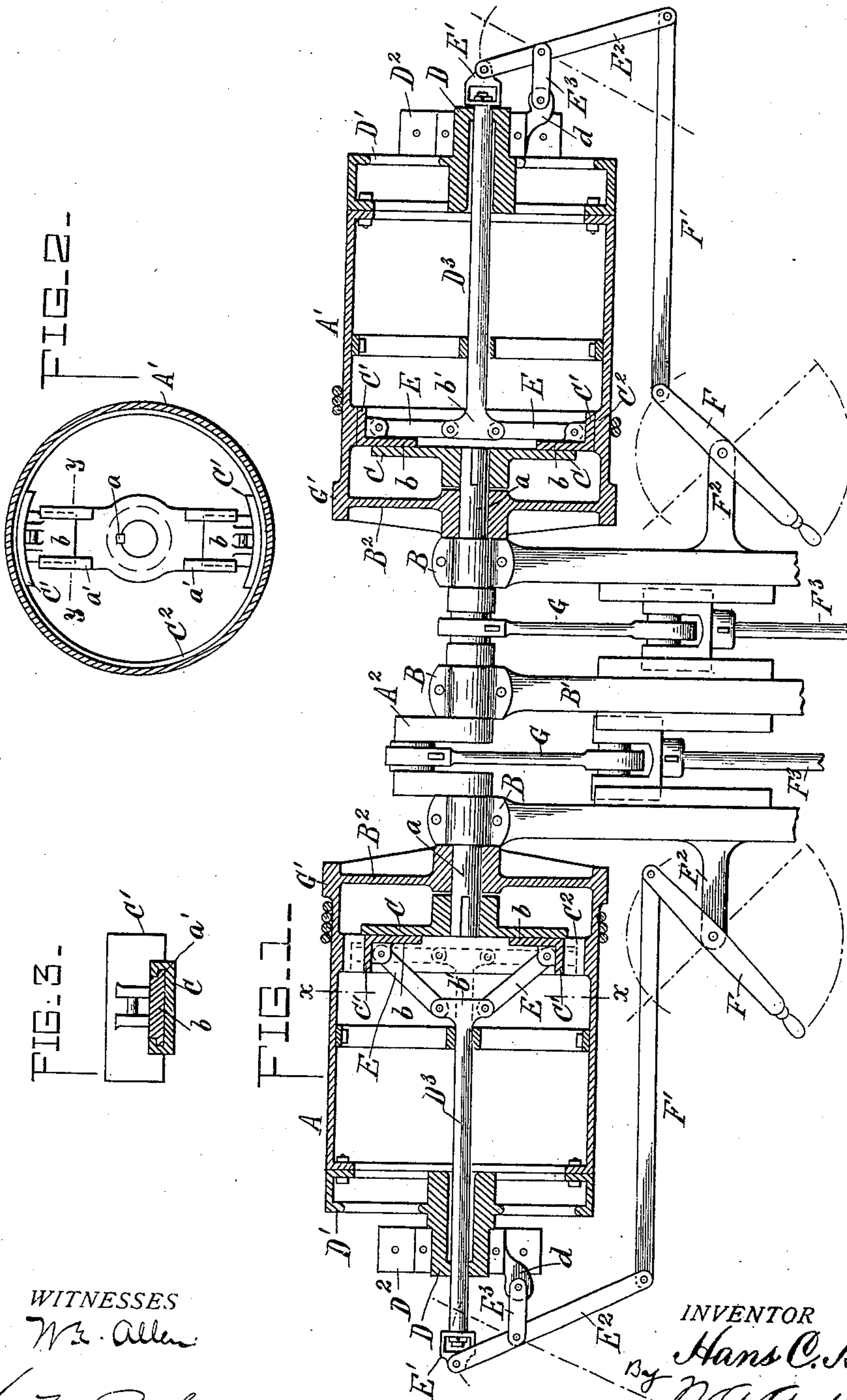
No. 641,362.

Patented Jan. 16, 1900.

H. C. BEHR.
HOISTING APPARATUS.

(Application filed Jan. 26, 1899.)

(No Model.)



WITNESSES

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HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 641,362, dated January 16, 1900.

Application filed January 26, 1899. Serial No. 703,440. (No model.)

To all whom it may concern:

Be it known that I, HANS C. BEHR, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Hoisting Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to certain new and useful improvements in hoisting machinery designed more especially for use in connection with the working of mines; and it consists in the arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings and described and pointed out in the specification.

The object of the invention is to economize in space for the working of the clutch mechanisms and in so arranging or constructing the winding-drums as to permit of the use of a comparatively short power or drive shaft, thus creating a considerable saving in the cost of erecting said hoisting machinery. This is attained by so arranging that the clutch mechanisms may be located and operated inside of the hoisting or winding drums and that the drive or power shaft shall serve as a bearing for one end of each drum.

Ordinarily the power or drive shaft extends entirely through the hoisting or winding drums, which adds considerably to the cost of this class of machinery where the drums are of considerable width, as is required for deep hoisting, and the clutch mechanisms by means of which the drums are thrown in or out of operation are arranged outside of the drums. It is this arrangement of the clutch mechanisms and length of the drive-shaft which I propose to overcome by the present invention.

For a comprehensive understanding of the invention reference must be had to the accompanying sheet of drawings, which forms a portion of this application, wherein—

Figure 1 is a top plan view, partly broken, of a double hoist system, one of the hoisting or winding drums being shown in section. Fig. 2 is a cross-sectional view in end elevation, taken on line *xx*, Fig. 1; and Fig. 3 is a cross-sectional top plan view of one of the frictional clutch-arms, taken on line *yy*, Fig. 2.

In the drawings the letters *A A'* are used

to indicate the hoisting or winding drums, which in the present case are loosely mounted upon the ends of a crank power or drive shaft *A²* arranged therebetween. This shaft works in bearings *B* of the engine-frame *B'*, and each end of said shaft projects a slight distance beyond the end or head *B²* of the drums *A A'*, Fig. 1. Within each hollow drum is located a double-arm driver *C* of a friction-clutch, which drivers are rigidly secured to each projecting end of the power or drive shaft *A²* by means of the keys or feathers *a*. Any suitable style of clutch mechanism may be employed, although I prefer to use what is known as a "friction-clutch" and have illustrated one of the simplest forms of this class of clutches. In the outer end portion of each clutch-arm a guideway *a'* is formed, within which works the downward extension *b* of the friction-clutch jaws or shoes *C'*, which are arranged to be forced out radially into frictional contact with an annular face *C²* on the interior of the hoisting or winding drums. The outer end of each hoisting or winding drum is supported by means of a hollow trunnion *D*, outwardly projecting from the removable head *D'*, bolted or otherwise secured to the drums proper. These trunnions *D* work in bearings *D²* and serve as suitable supports for holding the drums in proper alinement with the power or drive shaft *A²*. If so desired, instead of trunnions short hollow stationary shafts upon which the drums are free to revolve may be employed for this purpose. Through these hollow trunnions and into the hollow hoisting or winding drums extend the longitudinally-movable rods *D³*, each rod at its inner end terminating in a suitable head *b'*, which is attached or connected to the clutch jaws or shoes *C'* by means of the toggles *E*. As the rods *D³* are moved inward or outward within the drums the clutch jaws or shoes are thrown into or out of frictional engagement with the inner face of said drums. Inasmuch as the clutch mechanisms are secured to and revolve with the power or drive shaft, the rods *D³* through their connections are carried therewith. Hence it is necessary that the outer end of each rod be free to rotate. For this reason the outer end of each rod is swiveled in a yoke *E'*, which yoke is pivoted to the upper end of levers *E²*, fulcrumed to links

E^3 , attached at one end to fixed brackets d . The opposite or lower end of each fulcrumed lever is attached to an operating-lever F by means of a connecting-rod F' , said operating-levers being fulcrumed to brackets F^2 , so as to be within convenient reach of the operator.

Inasmuch as the mechanism for placing the winding or hoisting drums in or out of work is the same in each instance, I have deemed it only necessary to illustrate and describe the means by which one of the clutches is operated.

Connection is made in the present case between the power or drive shaft A^2 and the engine-pistons F^3 by means of the connecting-rods G , although any suitable form of connection or operating mechanism may be made use of—as, for instance, water-motors.

By the foregoing arrangement of the hoisting or winding mechanism it is only required that the power or drive shaft be of such length as to form connection between the inner ends of the hoisting or winding drums, hence enabling a comparatively short shaft to be made use of.

The brake mechanism which engages the brake G' of each drum is not illustrated in the drawings, as any well-known mechanism may be employed for this purpose.

The operation of placing the clutch jaws or shoes in or out of engagement with the winding or hoisting drums, so as to transmit motion of the power or drive shaft thereto, is accomplished by means of the operating-lever through the medium of its connecting mechanism. This will be readily understood by reference to the drawings without detail description as to the movement of the various parts.

By arranging the parts as before described I am enabled to use a comparatively short drive or power shaft for operating long drums, and by the location of the clutch mechanisms inside of the hoisting or winding drums create a saving of space and secure compactness, while by inserting the driving

power between the hoisting or winding drums more favorable action is obtained than where the engines or motor power is located at each end of a shaft, thus dispensing with the long intermediate connections required in such cases.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent, is—

1. The combination with a hollow hoist or winding drum, of a drive or power shaft extending into one end thereof and upon which the drum is loosely mounted, an independent support for the opposite end of the drum, clutch mechanism secured to and carried by the drive or power shaft, said mechanism being located within the drum, and independently-operated connected devices for throwing the clutch mechanism in or out of engagement with the drum.

2. The combination with the drive or power shaft, of the winding or hoist drums loosely mounted upon each end thereof, an independent support for the outer end of each drum, clutch mechanism secured to and carried by each end of the drive or power shaft, said clutch mechanisms being located within the drums, and independently-operated mechanisms for throwing the clutch mechanisms into or out of engagement with the hoist or winding drums.

3. The combination with the drive or power shaft, of the hollow hoist or winding drums arranged at each end thereof, clutch mechanism located within each hollow drum, and independently-operated connected devices for throwing the clutch mechanism in or out of engagement with the respective drums.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 21st day of January, 1899.

HANS C. BEHR.

Witnesses:

N. A. ACKER,
WALTER F. VANE.