No. 827,204. PATENTED JULY 31, 1906.

P. BAUCH.

HOISTING MACHINE.

APPLICATION FILED OCT. 25, 1905.

2 SHEETS—SHEET 1.

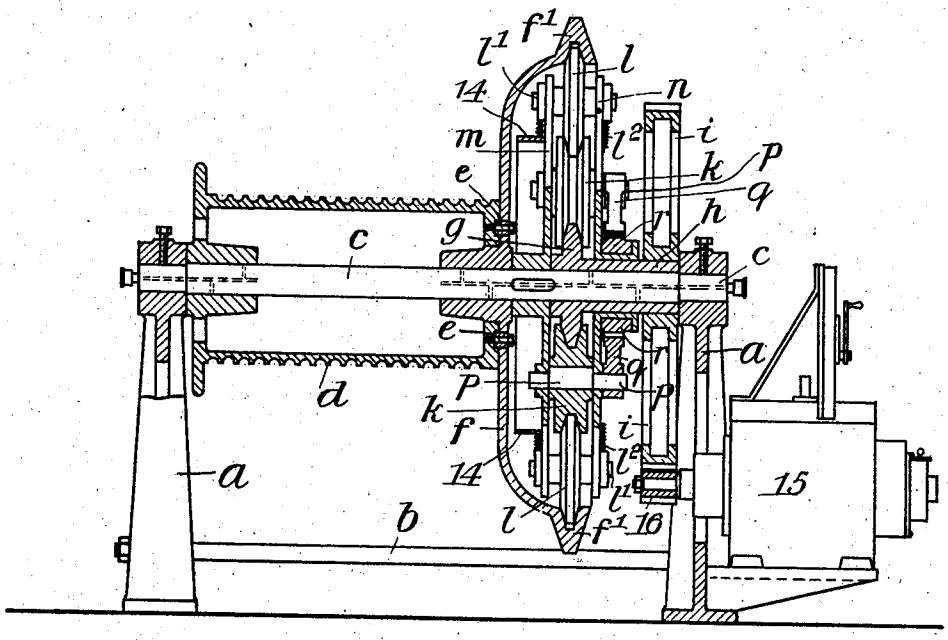

Fig. 1

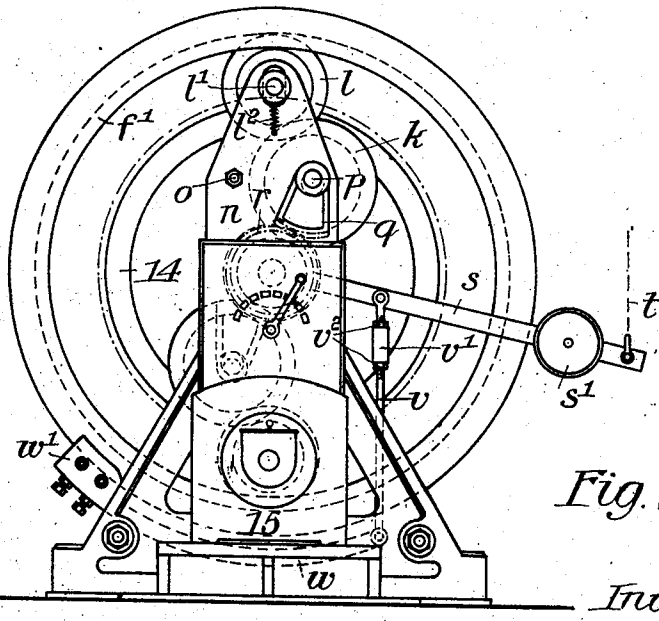

Fig. 2.

Witnesses
Frieda Yanzen.
Edward Büttner

Inventor
Paul Bauch

THE NORRIS PETERS CO., WASHINGTON, D. C.

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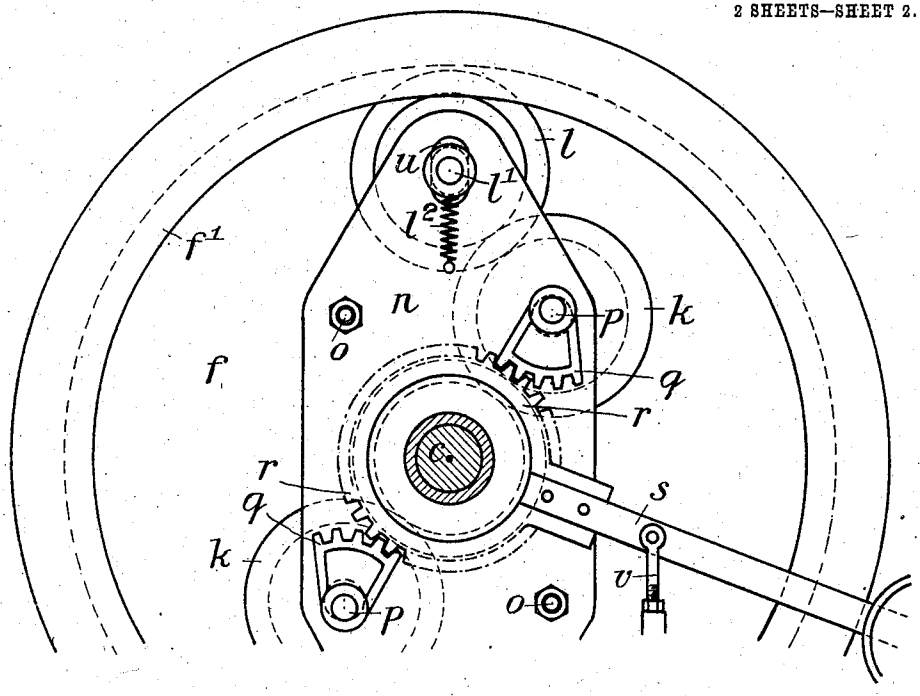
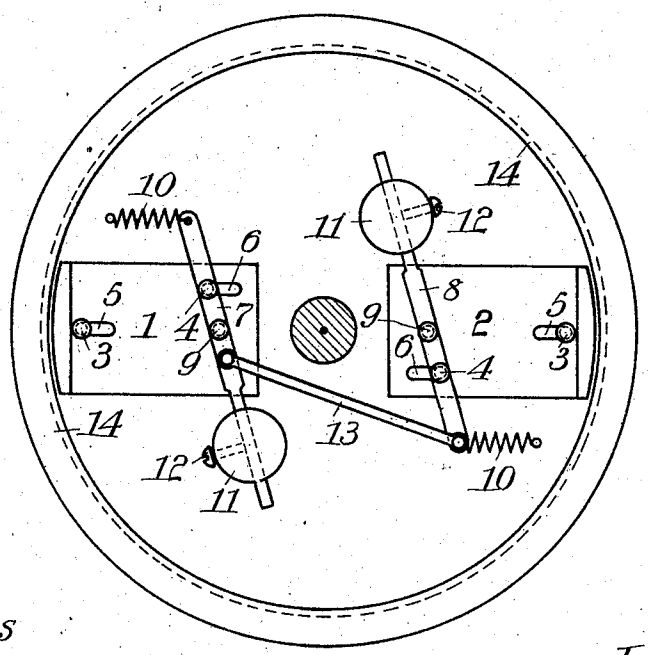


Fig. 3.



Witnesses
Frieda Janzen.
Edward Bittner

Fig. 4.

Inventor
Paul Bauch

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

PAUL BAUCH, OF HAMBURG, GERMANY.

HOISTING-MACHINE.

No. 827,204. Specification of Letters Patent. Patented July 31, 1906.

Application filed October 25, 1905. Serial No. 284,348.

To all whom it may concern:

Be it known that I, PAUL BAUCH, a citizen of Hamburg, and a resident of No. 68 Schellingstrasse, Hamburg, in the Empire of Germany, have invented a new and useful Hoisting-Machine, of which the following is a specification.

The present invention relates to an improved hoisting-machine which is driven by friction-gearing and in which the driving-wheel operates the drum by the agency of intermediary wheels, the latter imparting motion to a friction-disk fast to the drum.

The object of my invention is to afford a firm support for the various parts of a hoisting-machine of the kind referred to and to assemble said parts in the smallest possible space.

Further objects of my invention are to simplify and cheapen the construction and to render more efficient, serviceable, and durable in operation devices of the kind referred to.

With these ends in view the invention consists in the novel combination, arrangement, and adaptation of parts, all as more fully hereinafter explained, shown in the accompanying drawings, and then specifically set out in the appended claims.

Figure 1 of the accompanying drawings shows a longitudinal section of the hoisting-machine. Fig. 2 is a side elevation of same seen from the right of Fig. 1. Fig. 3 shows, on an enlarged scale, the friction-gearing for imparting rotation to the drum. Fig. 4 shows, likewise on an enlarged scale, a centrifugal brake for the hoisting-drum.

Two standards *a*, secured together by staying-rods *b* at their base ends, carry the shaft *c*, which is firmly keyed in its bearings, so as to be prevented from rotation. Loosely mounted on the shaft *c* is the drum *d*, which carries at one end and secured thereto by screws *e* or equivalent means the friction-disk *f*, preferably of cup-shaped cross-section, as clearly indicated in Fig. 1. Loosely mounted and freely rotatable on the shaft *c* is also the driving-wheel *g*. On the laterally-elongated nave *h* of the driving-wheel *g* is keyed a toothed wheel *i*, a sheave, or like known power-transmission means.

Between the driving-wheel *g* and the friction-disk *f* are arranged intermediary wheels or rollers *k l*, which are supported, on the one hand, in the bearing-plate *m*, fast to the shaft *c*, and, on the other hand, in the bearing-plate *n*, that is fixed to the aforesaid plate *m* by screw-bolts *o*. The rollers *k* run on eccentric shafts *p*, as shown in Figs. 1 and 3. A toothed segment *q*, fixed to the shaft *p* externally of the bearing-plate *n*, meshes with a pinion *r*, rotatable around the shaft *c*. A lever *s*, attached to the pinion *r*, causes the rotation of the latter by being lifted either by hand or from a distance by means of the rope *t*. The rotation of the pinion *r* is transmitted by the toothed segments *q* to the eccentric shafts *p*. Said shafts in consequence move the rollers *k* against the rollers *l*. The rollers *l* being slidably supported in slot-bearings *u*, as shown in Fig. 3, they are moved radially outward and into contact with the rim *f'* of the friction-disk *f*. By the gearing described rotation is imparted to the drum *d* for hoisting the load.

The governing-lever *s* is connected, by means of the rod *v*, with a two-armed lever *w*, which latter carries a brake-shoe *w'*. On the downward movement of the lever *s* the rollers *k* and *l* are moved out of contact with the driving-wheel *g* and the friction-disk *f*, respectively, to which end the shaft *l'* of the rollers *l* is attached to springs l^2, exerting a pulling force. The adjustable weight *s'* presses the lever *s* downward, which pressure is transmitted to the two-armed lever *w* by the agency of the pitman-rod *v*. In consequence the brake-shoe *w'* bears against the flange *f'* of the disk *f*, braking the latter effectively and stopping the drum *d* with the load suspended. The braking action of the shoe *w'* can be adjusted as required and in accordance with the wear by shifting the weight *s'* on the lever *s* and by varying the length of the pitman-rod *v*.

As shown in Fig. 2, the rod *v* is made in two parts. A sleeve *v'* connects the two parts together, said sleeve being provided with right and left female screw-threads fitting on corresponding male screw-threads of the rod ends. Counter-nuts v^2 secure the aforesaid connection.

On raising the lever *s* only to such an extent which keeps the intermediary rollers *k l* out of gearing with the driving-wheel *g* and the friction-disk *f*, but lifts the brake-shoe *w'* off the rim *f'*, the drum *d* is enabled to freely run on the shaft *s* under the weight of the load, the latter being thereby lowered as required.

I have found it advantageous to provide a self-acting brake for regulating the speed of

rotation of the drum. Referring to Fig. 4, said brake is of the centrifugal type. It comprises two brake-shoes 1 and 2, acting diametrically opposite against a stationary rim 14, which is fixed to the stationary bearing-plate *m*. The brake-shoes 1 and 2 are carried and guided radially in regard to the disk *f* by means of pins 3 and 4, fast to the disk *f* and penetrating through longitudinal slots 5 and 6. To cause said brake-shoes to be dependent in their relative movement, I employ two two-armed levers 7 and 8, having their fulcrum around the aforesaid pins 4 and being pivotally attached at 9 to the brake-shoes 1 and 2. One extremity of the two-armed levers is attached to a spring 10. The other extremity carries a weight 11, adapted to be fixed at various distances from the fulcrum by means of the set-screw 12. A rod 13 connects both levers together, being pivotally attached thereto, as shown in Fig. 4. The centrifugal force created in the rotation of the disk *f* is counteracted by the springs 10 and the weights 11 until the speed of rotation becomes excessive, when the brake-shoes 1 and 2 will approach the stationary rim 14 and exert a powerful braking action by their frictional contact on said rim. The braking power can be adjusted and adapted to the work by varying the position of the weights 11 in regard to the fulcrum of the two-armed levers.

By way of example I have shown in the drawings an electromotor 15 for driving the hoisting-machine, a pinion 16 on the shaft of the motor meshing with the toothed wheel *i*.

I wish it to be distinctly understood that I do not confine myself to the details of construction shown in the drawings, but that I may carry out many modifications without departing from the spirit of the invention. For instance, instead of two pairs of rollers *k l* I may employ four pairs.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a hoisting-machine, the combination of a stationary shaft, a drum loosely mounted thereon, a friction-disk fast to one end of the drum, a driving-wheel loosely mounted on the aforesaid stationary shaft, friction-rollers *k*, *l*, stationary supports *m*, *n* affording bearings for said friction-rollers, the rollers *k* being keyed on eccentric shafts *p* while the shaft *l'* of the rollers *l* is slidable axially in regard to the stationary shaft, means for throwing the aforesaid friction-rollers in and out of gear with the driving-wheel and the friction-disk of the drum, and means for braking the drum, substantially as described and shown and for the purpose set forth.

2. In a hoisting-machine, the combination of a stationary shaft, a drum loosely mounted thereon, a friction-disk fast to one end of the drum, a driving-wheel loosely mounted on the aforesaid stationary shaft, friction-rollers *k*, *l*, stationary supports *m*, *n* affording bearings for said friction-rollers, the rollers *k* being keyed on eccentric shafts *p* while the shaft *l'* of the rollers *l* is slidable axially in regard to the stationary shaft, a toothed segment *q* on the external end of the shafts *p*, a pinion *r* loosely mounted on the stationary shaft meshing the toothed segments, a lever *s* for rotating the pinion *r* and throwing the friction-rollers *k*, *l* in and out of gear with the driving-wheel and the friction-disk of the drum, and means for braking the drum, substantially as described and shown and for the purpose set forth.

3. In a hoisting-machine, the combination of a stationary shaft, a drum loosely mounted thereon, a friction-disk fast to one end of the drum, a driving-wheel loosely mounted on the aforesaid stationary shaft, friction-rollers *k*, *l*, stationary supports *m*, *n* affording bearings for said friction-rollers, the rollers *k* being keyed on eccentric shafts *p* while the shaft *l'* of the rollers *l* is slidable axially in regard to the stationary shaft, a toothed segment *q* on the external end of the shafts *p*, a pinion *r* loosely mounted on the stationary shaft meshing with the toothed segments, a lever *s* for rotating the pinion *r* and throwing the friction-rollers *k*, *l* in and out of gear with the driving-wheel and the friction-disk of the drum, a two-armed lever *w* supported in the standards of the stationary shaft, a rod *v* variable in length connecting the levers *s* and *w*, and a brake-shoe *w'* at the opposite end of the lever *w* adapted to bear against the rim *f'* of the friction-disk, when the lever *s* is depressed, substantially as described and shown and for the purpose set forth.

In witness whereof I have hereunto signed my name, this 14th day of October, 1905, in the presence of two subscribing witnesses.

PAUL BAUCH.

Witnesses:

OTTO W. HELLMRICH,

IDA CHRIST. HAFERMANN.