

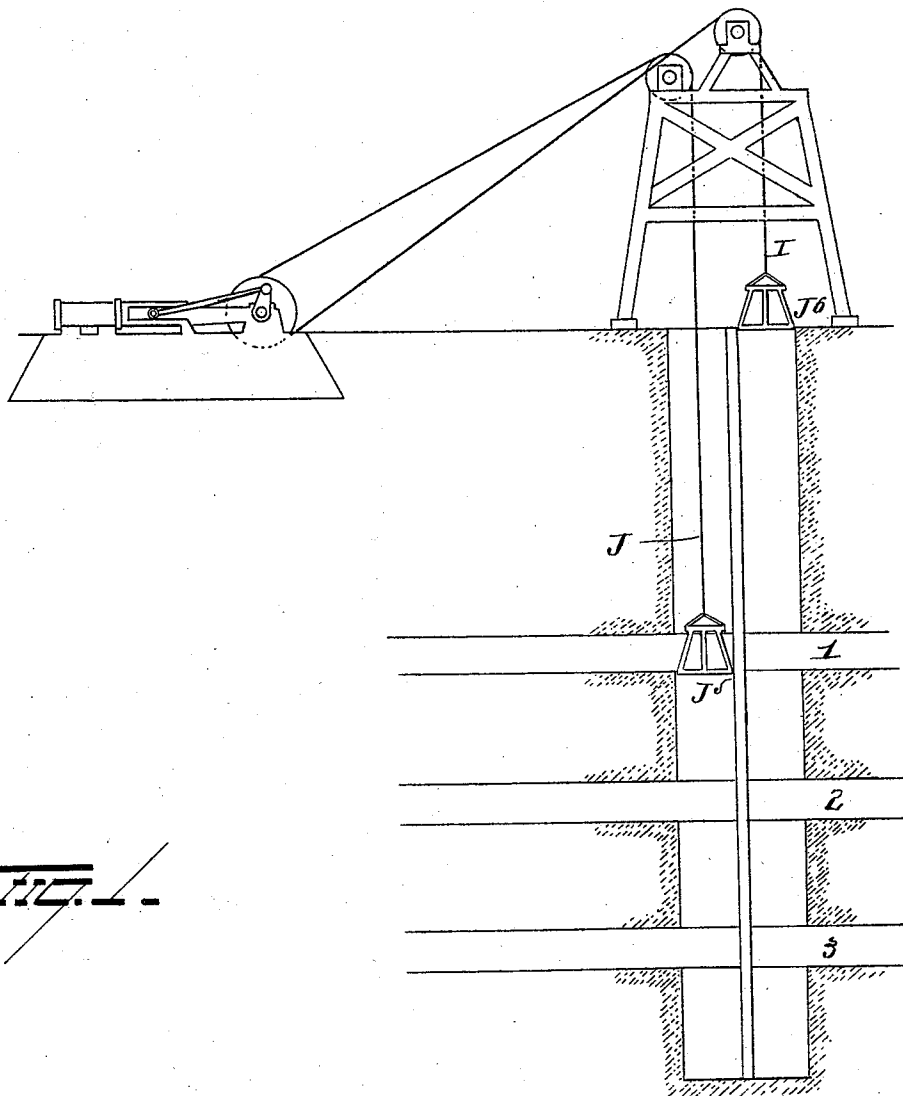
(No Model.)

3 Sheets—Sheet 1.

S. H. PITKIN.
HOISTING DRUM.

No. 580,952.

Patented Apr. 20, 1897.



Witnesses
E. Nottingham.
G. F. Downing.

Inventor
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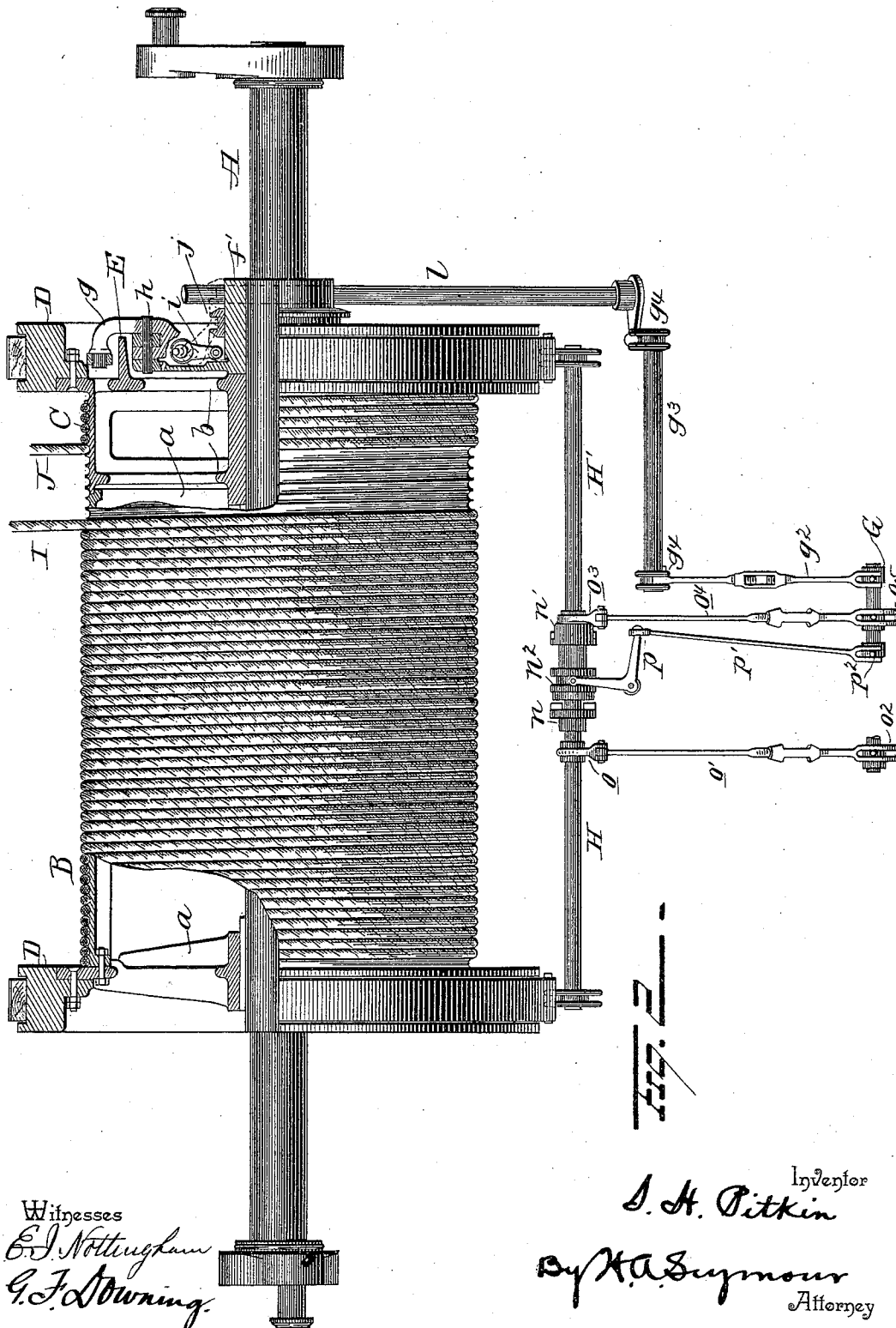
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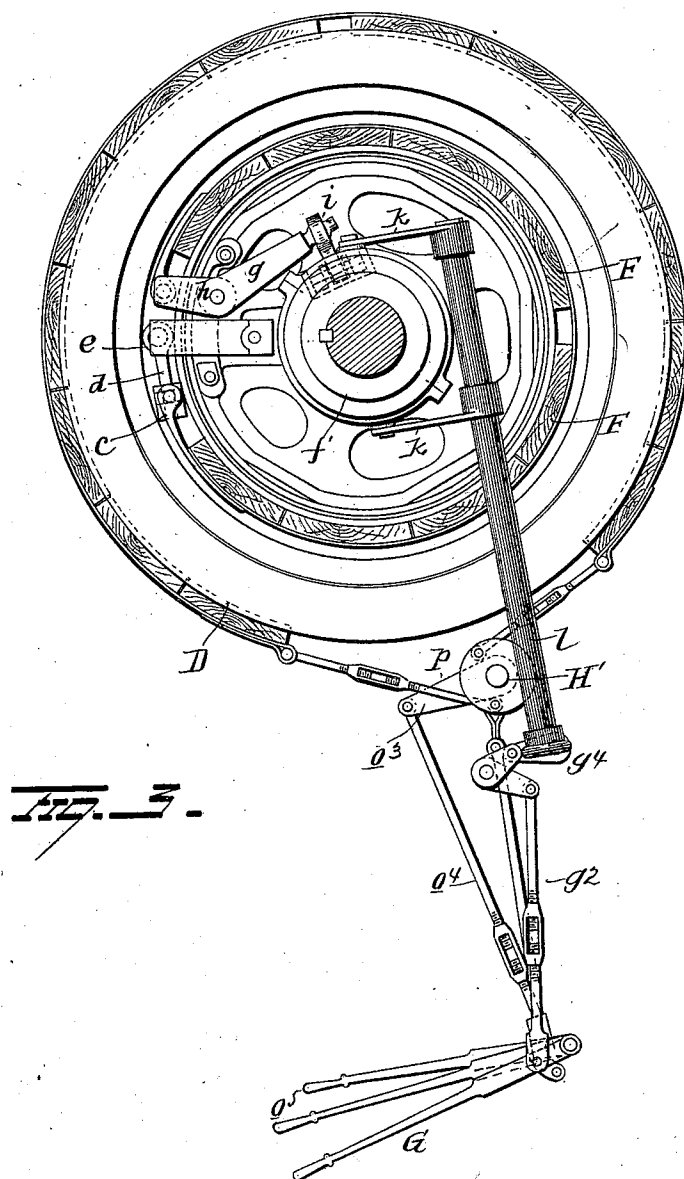
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UNITED STATES PATENT OFFICE.

STEPHEN H. PITKIN, OF AKRON, OHIO, ASSIGNOR TO THE WEBSTER, CAMP & LANE MACHINE COMPANY, OF SAME PLACE.

HOISTING-DRUM.

SPECIFICATION forming part of Letters Patent No. 580,952, dated April 20, 1897.

Application filed September 12, 1896. Serial No. 605,614. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN H. PITKIN, a resident of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Hoisting-Drums; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in hoisting-drums, and is designed particularly for the rapid handling of ore, coal, or other material from mines by means of balanced cages or skip-cars.

The hoisting mechanism now universally used for hoisting in balance where adjustment is required for different levels comprises two large drums mounted on a shaft, each drum being of a length and diameter sufficient to receive its full length of rope and each provided with a clutch for locking it to the shaft and with a brake for locking it against movement.

The object of my invention is to provide a construction wherein one drum serves the purpose of two drums as heretofore used and permits of the use of a smaller drum than heretofore considered practicable and to provide a plant which will be of the same capacity and do the same work as economically as those heretofore constructed and at a considerable reduction in the first cost.

In the accompanying drawings, Figure 1 is a diagrammatic representation of a shaft, showing the balanced cages therein. Fig. 2 is a view in plan, partly in section, of my improved drum and its connected parts; and Fig. 3 is a view in side elevation of same.

A represents a shaft mounted at its ends in suitable bearings and carrying the drum, composed of two sections B and C. The longer section B of the drum is provided with two spiders or heads *a*, securely keyed to the shaft A or secured thereto by means of a clutch, while the shorter section C is provided with a single hub loosely mounted on the shaft and with two heads or spiders *b* integral with the hub. The two sections of the drum are provided with overlapping lips, forming a

close union between the two sections, and each is also provided at its outer end with a heavy rim D, which serves as a fly-wheel to regulate the motion and secure early cut off and consequent economy of expansion of steam in engine-cylinders and as brake-rims on which brakes are used in stopping and controlling the motion of the drums. The smaller section C is also provided on its outer end with the clutch-flange E. This flange is integral with or rigidly secured to the smaller section C of the drum, and while I have shown the flange as embraced by the friction-band F, I would have it understood that I do not confine myself to this form of clutch.

The friction-band is secured at its end *c* by strap *d* and suitable connections to the bracket *e*, rigidly secured to the hub *f*, keyed to the shaft A. This band embraces the flange and is connected at its free end to the lever *g*, which latter is pivoted at *h*. This lever is connected by a toggle-link *i* with the clutch-sleeve *j*. This sleeve *j* is mounted to slide on the hub *f* and is moved thereon by the arms *k* of the rock-shaft *l*, which latter is mounted in suitable bearings and is rocked by the lever G, pitman *g*², rock-shaft *g*³, and connections *g*⁴ between rock-shaft *g*³ and rocking shaft *l*.

From the foregoing it will be seen that by moving the lever G in one direction the shaft *l* is rocked in the direction to move the clutch-collar *j* inwardly, thus moving the longer end of lever *g* outwardly and clamping the friction-band to the flange E, and when the parts are thus locked the two sections B and C of the drum move in unison.

Each rim of fly-wheel D is also engaged by a friction-band or a brake of any approved form, and the latter are applied and released through the instrumentality of the mechanism to be now described.

H H' are two shafts mounted in suitable bearings and arranged in line with their adjacent ends approximately abutting. Located between the clutch-section *n*, rigidly secured to the shaft H, and the clutch-section *n'*, loosely mounted on shaft H' and embracing the meeting ends of both shafts, is the sliding clutch-section *n*². This clutch-section is

keyed to the shaft II', and when moved to the right engages clutch-section n' and locks it to the shaft, and when moved to the left engages clutch-section n and locks the two shafts together. The shaft II is connected by arms o and pitman o' with lever o^2 , and hence it will be seen that when the sliding clutch-section n^2 is disengaged from clutch-section n the brake actuated by the shaft II can be applied to its fly-wheel D for locking the larger section B of the drum against movement.

The clutch-section n' is provided with arms o^3 , which are connected by pitman o^4 to lever o^5 . Hence when the sliding section n^2 of the clutch is in engagement with the section n' a movement of the lever o^5 actuates the brake connected to the shaft II'. When, however, the section n^2 of the clutch is in engagement with the section n of the clutch, a movement of the lever o^2 operates through the pitman o' to actuate both brakes. The section n^2 of the clutch is actuated by the bell-crank lever p , pitman p' , and lever p^2 .

From the foregoing it will be seen that the brakes can be applied together or independently, thus permitting either section of the drum to be held while the other section is rotating.

The two-part drum is designed for hoisting with balanced cages where a limited adjustment—say, within two or three levels—is all that is desired. The rope I on the large section and the rope J on the smaller section are secured at diametrically opposite points, so that when one rope is winding the other is unwinding, thus utilizing the space vacated by one rope by winding the other thereon. The shorter section C of the drum is designed to carry sufficient rope to reach from the top level being worked to the bottom level being worked, and I find from practice that about two hundred and fifty feet of rope is sufficient in many cases. The two ropes I and J are of the same length, and hence when the rope I is wound up and the rope J unwound the former will approximately cover the larger section B of the drum, whereas when the rope J is wound on the drum and the rope I unwound the former covers the smaller section C and the greater part of the larger section B.

In Fig. 1 I have given a diagrammatic representation of a shaft, and for the purpose of illustration I have shown three working levels. If it is desired to work from the upper level 1, the adjustment of the ropes is made as follows: If necessary, the drum (as a whole) is turned to wind up on the rope I and unwind on rope J until the cage J^5 is opposite level 1. If by this time the cage J^6 on the rope I has not reached the surface, the section C of the drum is locked by its brake and its clutch released. This holds the section against movement and permits the section B of the drum to be rotated until the cage J^6 has reached the surface.

It will be understood that the length of rope J between the surface and the first working level can wind on section B of the drum, but must be completely unwound therefrom just before its cage reaches the first working level, so that when such level is reached the section B of the drum will be free to move without interfering with rope J. After the ropes have been thus adjusted the clutch coupling section C of the drum to the shaft is again applied, thus locking the two sections together, causing them to move in unison. Hence by rotating the drum it will be seen that when one cage reaches the surface the other is at the proper level.

If it is desired to work from the second level, the drum would be turned to bring cage J^5 to this level, the section C of the drum would be locked by the brake, and the section B rotated to bring cage J^6 to the surface, after which the section C would be clutched to the shaft and its brake released. When working from this level it is necessary, as before explained, to have the rope J unwound from section B of the drum just before reaching the level, so that the section B can be rotated to bring cage J^6 in its proper adjustment.

When it is desired to hoist with one cage only, the cage carried by the rope on the section C can be lowered to the bottom of the shaft or so that rope J is clear of drum B, its clutch released, and its brake applied, thus permitting the other cage to be worked alone.

The advantages in the use of a two-part drum such as I have described are that one drum serves the purpose of two as heretofore constructed, it permits of the use of a smaller drum than was heretofore considered practicable, and provides a plant that will be of the same capacity and do the same work as economically as the more costly plants now universally used.

It is evident that numerous slight changes might be made in the general arrangement of parts herein shown and described without departing from the spirit and scope of my invention, and hence I would have it understood that I do not limit myself to the precise details of construction shown, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. A hoisting device comprising a shaft, a sectional drum, one section of the drum being rigidly secured to the shaft and the other loose on the shaft but fixed against endwise sliding movement thereon, and a clutch for locking the loose section to the shaft, substantially as set forth.

2. A hoisting device comprising a shaft, a sectional drum, one section of which is fixed on the shaft and the other loose thereon, and a clutch externally located and adapted to

lock or unlock the drum-section from the shaft without the necessity of any sliding movement thereupon, substantially as set forth.

3. In a hoisting device the combination with a shaft, a two-part drum thereon, one part of the drum being securely keyed or clutched to the shaft and the other loose thereon, a clutch for locking the loose section of the drum to the shaft, a brake for each drum-section, and devices for operating the brakes either simultaneously or independently.

4. In a hoisting device the combination with a shaft, a two-part drum thereon, the outer surface of the two drums forming a continuous unbroken winding surface, one part of the drum being securely keyed or clutched to the shaft and the other loosely mounted to turn but not slide thereon, a brake-rim on the outer end of each section of the drum, brakes and a clutch for locking the loose section to the shaft.

5. A hoisting device comprising a shaft, a sectional drum, a combined brake-rim and fly-wheel on the outer end of each section one section of the drum being securely keyed or clutched to the shaft and the other loosely

mounted to turn but not slide thereon, a brake for each rim and a clutch for locking the loose section to the shaft.

6. A hoisting device comprising a shaft, a sectional drum, one section securely keyed or clutched to the shaft and the other loosely mounted thereon, a brake-rim on the outer end of each section of the shaft, a brake for each rim, devices for actuating the brakes independently or together, and a clutch for locking the loose section of the drum to the shaft.

7. A hoisting device comprising a shaft a sectional drum one section keyed or clutched on the shaft and the other loosely mounted thereon, a brake-rim on the outer end of each section of the drum, a brake for each rim, devices for actuating the brakes independently or together and a clutch for locking the loose section of drum to shaft.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

STEPHEN H. PITKIN.

Witnesses:

J. G. POPE,
W. G. PITKIN.