

(No Model.)

2 Sheets—Sheet 1.

S. J. CHAPMAN.

Reversing Gear and Brake Mechanism for Hoisting  
Drums.

No. 230,613.

Patented Aug. 3, 1880.

Fig. 1.

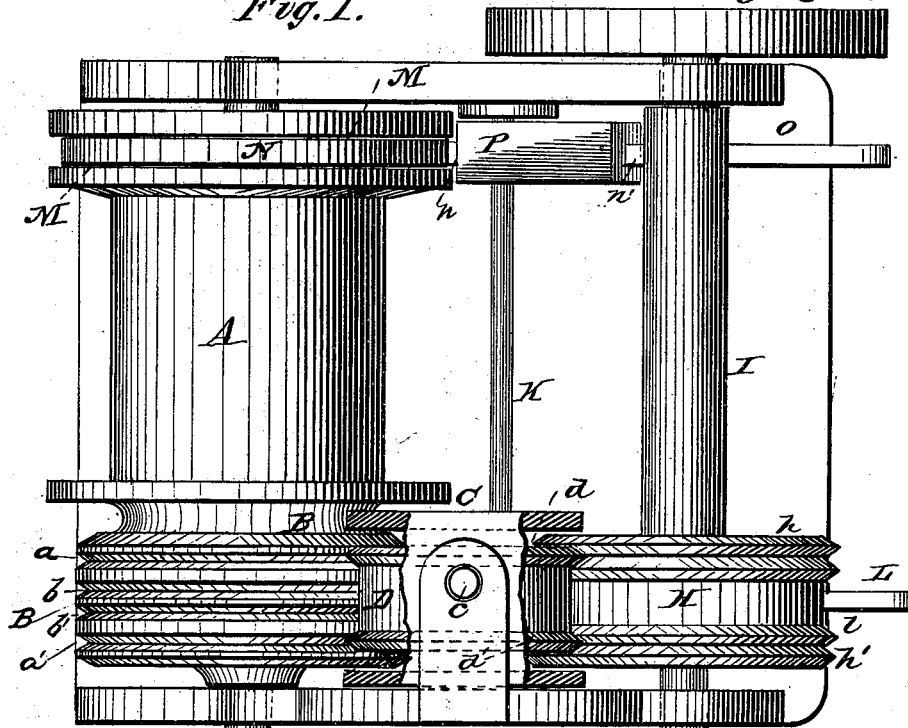
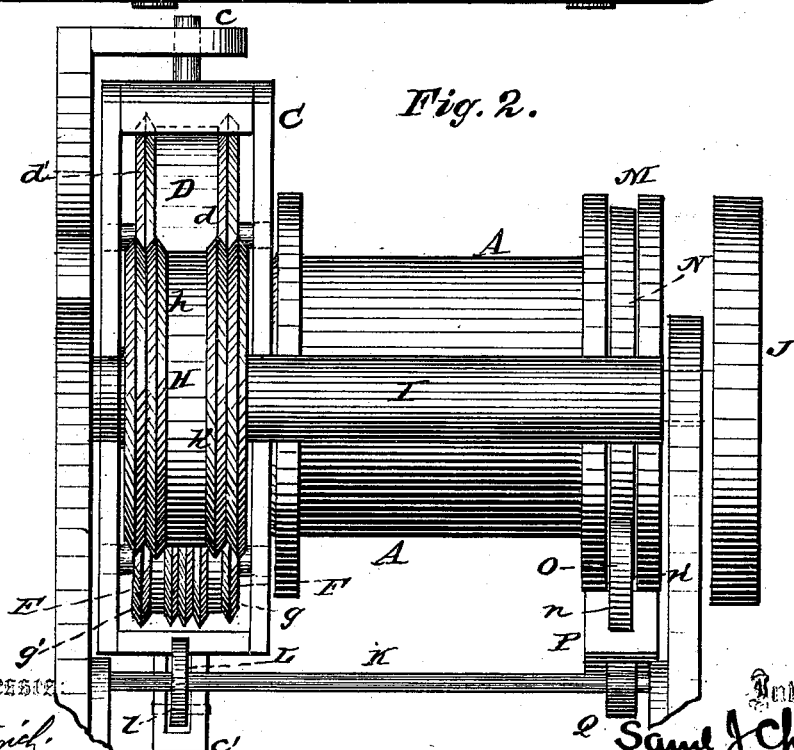


Fig. 2.



Witnessed by  
D. D. Birtwell.  
A. M. Bright.

For  
Seagott & Seagott.

Inventor  
S. J. Chapman.  
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

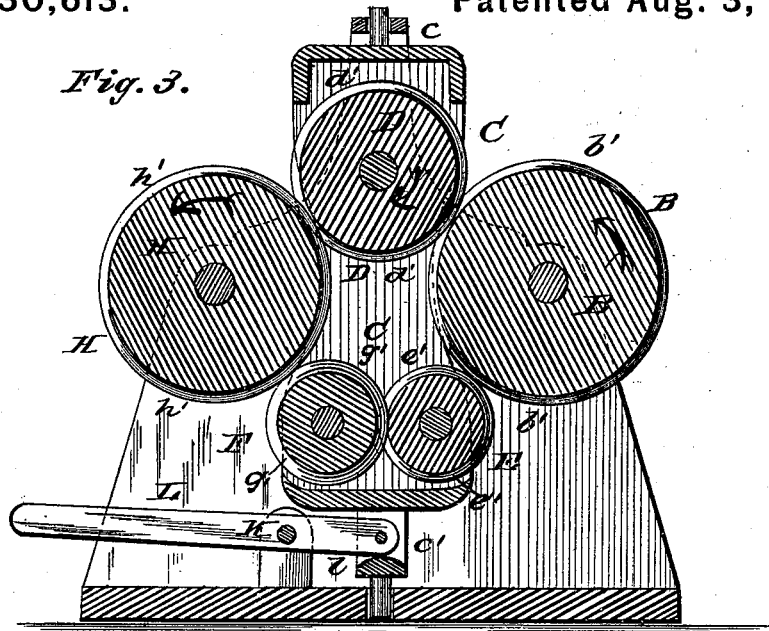


Fig. 4.

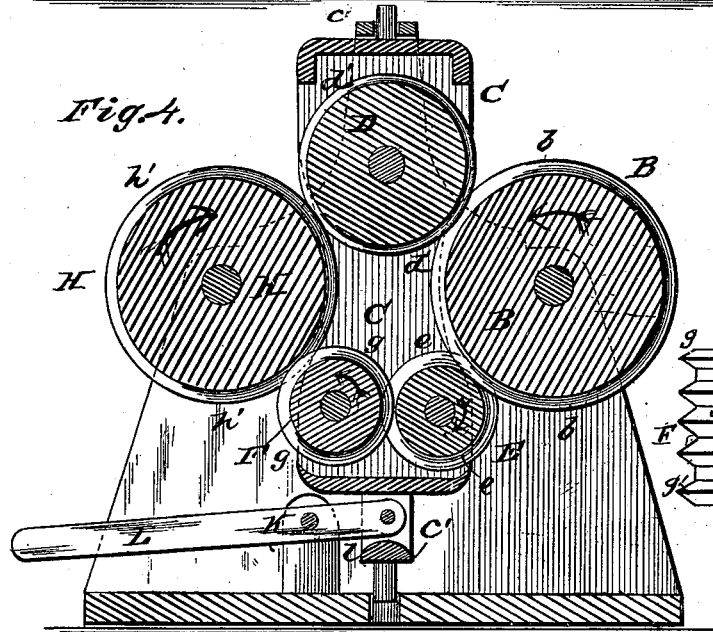


Fig. 6.

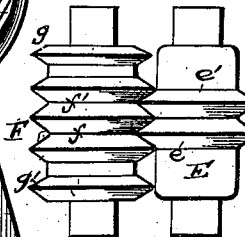
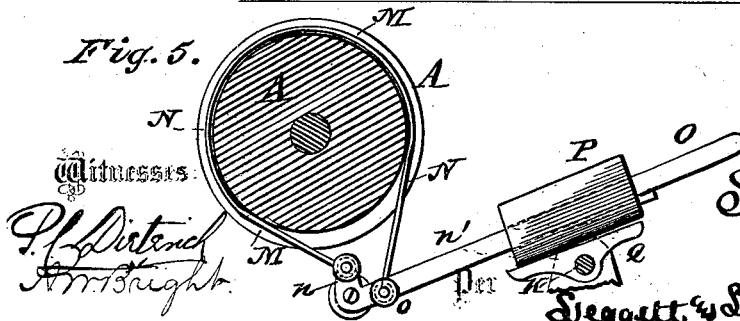


Fig. 5.



Inventor  
Samuel J. Chapman.

Attorneys.  
Seagett & Seagett.

# UNITED STATES PATENT OFFICE.

SAMUEL J. CHAPMAN, OF CHARLESTON, SOUTH CAROLINA, ASSIGNOR TO DANIEL S. SILCOX, T. M. MORDECAI, AND HERMAN LEIDING, OF SAME PLACE, ONE-FOURTH TO EACH.

## REVERSING-GEAR AND BRAKE MECHANISM FOR HOISTING-DRUMS.

SPECIFICATION forming part of Letters Patent No. 230,613, dated August 3, 1880.

Application filed March 23, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL J. CHAPMAN, of Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Reversing-Gear and Brake Mechanisms for 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to an improvement in hoisting-machines, the object being to provide simple and effective mechanism for revolving the winding-drum of a hoisting-machine in either direction by power transmitted from a constantly-revolving driving-shaft; and a further object being to provide an automatic brake attachment for locking the winding-drum in a stationary position when the driving-gearing is thrown out of engagement with the winding-drum.

To these ends my invention consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of my improvement in hoisting-machines. Fig. 2 is a side elevation. Fig. 3 is a vertical section through the friction-gearing, showing the latter in proper adjustment for revolving the winding-drum in one direction. Fig. 4 is a similar view, showing the gearing adjusted to revolve the winding-drum in the opposite direction. Fig. 5 is a view, in side elevation, of the friction-brake mechanism. Fig. 6 is a plan view of the two friction-wheels employed for revolving the drum in one direction.

A represents the winding-drum of a hoisting-machine having a friction gear-wheel, B, either formed on one end of the drum, or secured thereto or to the shaft of the winding-drum. Friction gear-wheel B is provided with four V-shaped grooves, *a a' b b'*. A vertically-adjustable frame, C, is located in close prox-

imity to the friction gear-wheel B, said frame being provided at its upper and lower end with guides *c c'*, or it may be guided in any manner desired. Within the upper end of the adjustable frame C is journaled a friction gear-wheel, D, the periphery of which is provided with the two V-shaped collars or rings *d d'*, which correspond with and are adapted to fit into the V-shaped grooves *a a'* in the periphery of the gear-wheel B of the winding-drum. In the lower end of the frame C are journaled two small friction wheels or pulleys, E F. Wheel E is furnished with two V-shaped collars or rings, *ee'*, which are adapted to engage in the grooves *b b'* in the friction-wheel B. The other small friction wheel or pulley, F, is provided with two V-shaped grooves, *f f'*, with which engage the corresponding V-shaped collars or rings *e e'* on the small wheel or pulley E. Wheel F is also furnished with two V-shaped collars or rings, *g g'*, which are adapted to engage in corresponding grooves *h h'*, formed in the periphery of the friction-wheel H, which latter is secured to the driving-shaft I, the latter being revolved by a band applied to pulley J, or by any suitable friction or cog gearing. K is a rock-shaft, to which is rigidly secured a lever, L, the short arm *l* of which is connected with the frame C or lower guide *c'*. To the end of the winding-drum opposite the friction wheel or gear B is formed a friction-band groove, M, in which is placed a metal band, N, one end of which is attached to the short arm *n* of the bell-crank lever O, while the other end of the band is secured to the long arm *n'* of said lever at the point *o*. To the long arm *n'* of the bell-crank lever O is adjustably secured a weight, P, which may be moved toward or from the outer end of the lever, and secured in any desired adjustment. Weight P rests upon the double toe Q, which latter is rigidly secured to one end of the rock-shaft K.

Having described the construction and arrangement of the several parts of my improved hoisting apparatus, I will now proceed to give a brief description of its operation.

The driving-shaft I is constantly revolved in one direction, power being transmitted thereto by any suitable gearing, belting, or directly

from the pitman-rod of a steam-engine or other motor.

When it is desired to revolve the winding-drum in the direction indicated by the arrow shown in Fig. 4, the long arm of lever L is depressed, thereby raising the adjustable frame C and disengaging the friction-wheel D from the friction-wheels on the driving-shaft and winding-drum, and throwing one of the small grooved wheels in the lower end of the frame C in engagement with the friction-wheel H on the driving-shaft, and the other one in engagement with the friction-wheel B on the winding-drum. Thus it will be observed that to revolve the winding-drum motion is transmitted from the driving-shaft to the winding-drum through two intermediate gears or friction-wheels.

To revolve the winding-drum in the opposite direction, or as illustrated in Fig. 3, the short end of lever L is depressed, thereby disengaging the small friction-gears from the friction-wheels on the driving-shaft and winding-drum, and throwing the single friction-gear D in engagement with the friction-wheel on the driving-shaft and the friction-wheel on the winding-drum, and thus revolving the latter in the opposite direction.

The brake mechanism of the winding-drum is automatically actuated as follows: When the lever L is either raised or lowered to revolve the winding-drum either to the right or left, the rock-shaft to which the lever is secured is turned, and with it the double toe Q, upon which latter rests the weight connected with the brake-lever, and thus the weighted brake-lever is raised and the brake or friction-band slackened, so as not to interfere with the free rotation of the winding-drum. By releasing the end of lever L the weight on the brake-lever operates to automatically tighten the friction-band and lock the winding-drum in a stationary position.

It is evident that slight changes may be made in the construction and relative arrangement of parts without departing from the spirit of my invention—as, for instance, the friction-wheels may be provided with any desired number of grooves or collars, which may be of any form to effect a firm frictional engagement for operation.

Instead of employing friction-gears I may use cog-gearing. Hence I would have it understood that I do not restrict myself to the exact construction and arrangement of parts shown and described; but,

Having fully described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a winding-drum and driving-shaft, both provided with friction or gear wheels, of an intermediate adjustable frame having three friction or gear wheels journaled therein, and means for adjusting said frame to throw one of said wheels in operation to revolve the winding-drum in one direction and to throw two of said gears or wheels in operation to revolve the winding-drum in the opposite direction, substantially as set forth.

2. The combination, with a winding-drum, driving-shaft, and intermediate gearing for revolving the winding-drum in opposite directions, of brake mechanism adapted to be operated automatically and disengage the friction-brake when the winding-drum is revolved in either direction, and to tighten the friction-brake when the intermediate gearing is shifted out of engagement with the winding-drum, substantially as set forth.

3. The combination, with a winding-drum and driving-shaft, both provided with grooved or intermeshing friction-wheels, of an intermediate frame having a friction-wheel journaled in its upper end, and two friction-wheels journaled in its lower end, substantially as set forth.

4. The combination, with a winding-drum and driving-shaft, each provided with friction-wheels, an intermediate adjustable frame having three friction-wheels journaled therein, and a lever for raising and lowering said frame, of a rock-shaft provided with a double toe, a friction-band, and a brake-lever provided with a weight which is supported upon said double toe on the rock-shaft, substantially as set forth.

5. A hoisting-machine consisting essentially of the following parts: a winding-drum, driving-shaft, and gearing for transmitting motion from a continuously-revolving driving-shaft to the winding-drum, so as to revolve the latter in either direction, in combination with a friction-brake and mechanism for automatically disengaging the brake when motion is imparted to the winding-drum in either direction, and to lock the brake when the winding-drum is not in motion, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of February, 1880.

SAMUEL J. CHAPMAN.

Witnesses:

T. MOULTRIE MORDECAI,  
ED. H. WARING.