4 Sheets--Sheet 1.

G. C. TIMPE.

Hoisting-Machines.

No. 146,492. Patented Jan. 13, 1874.

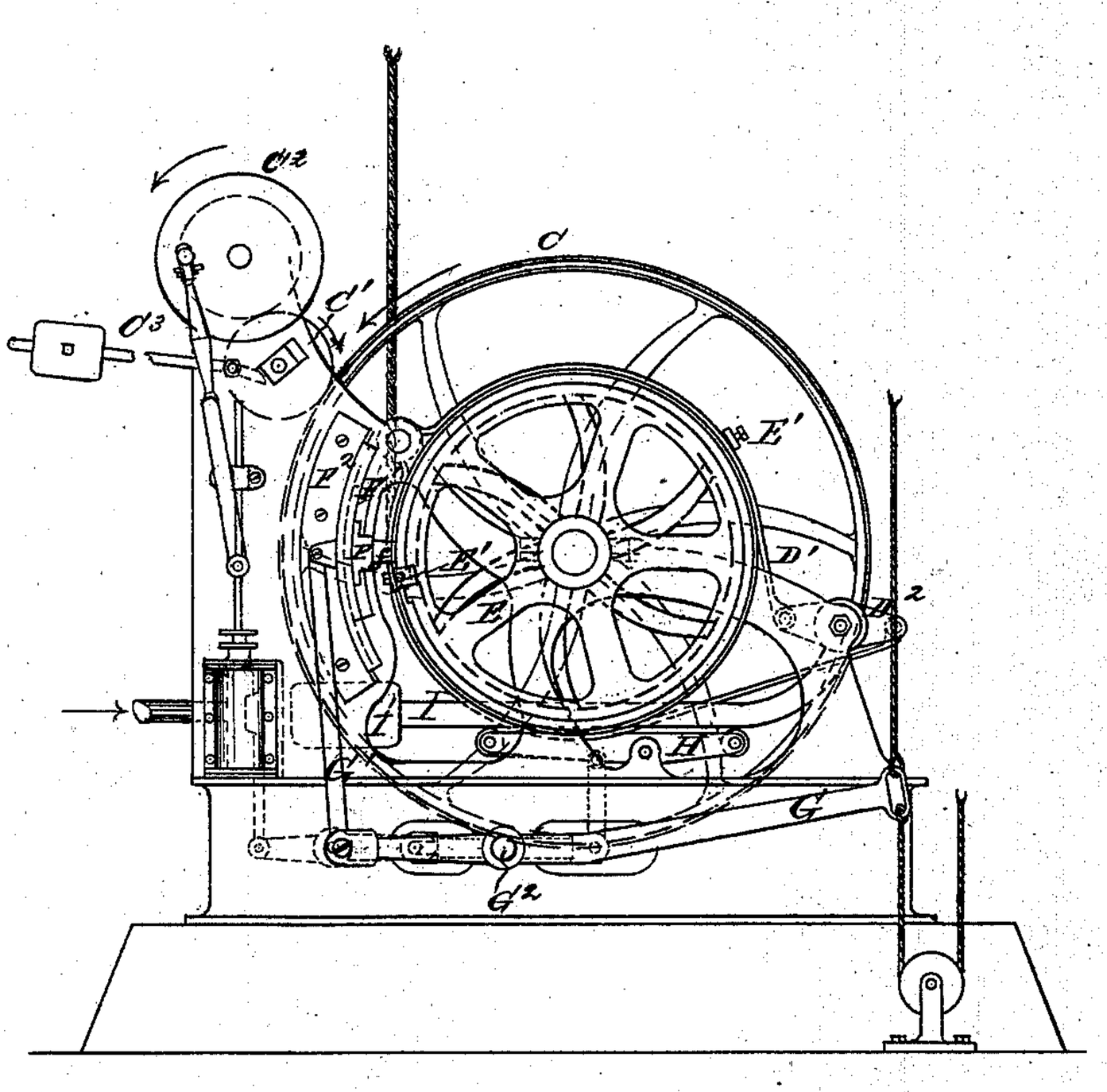

Fig. 1.

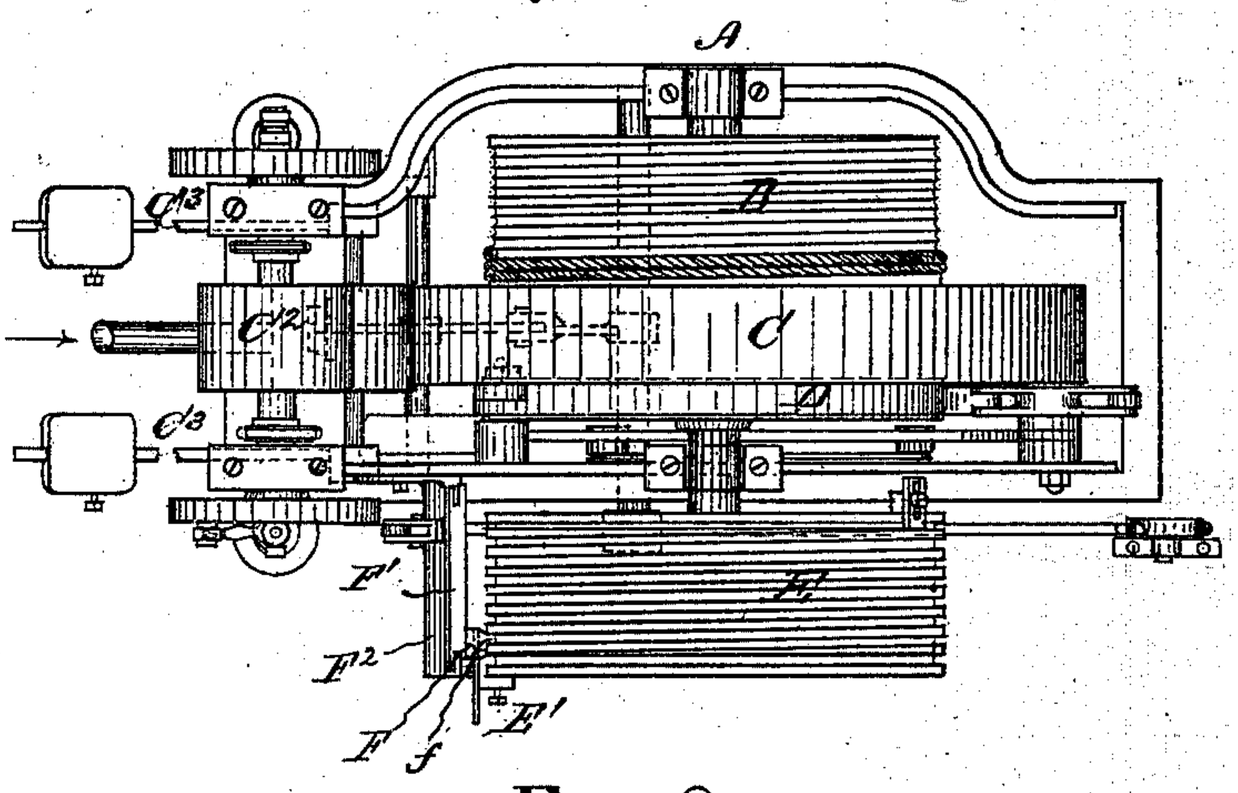

Fig. 2.

Witnesses
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4 Sheets--Sheet 2.

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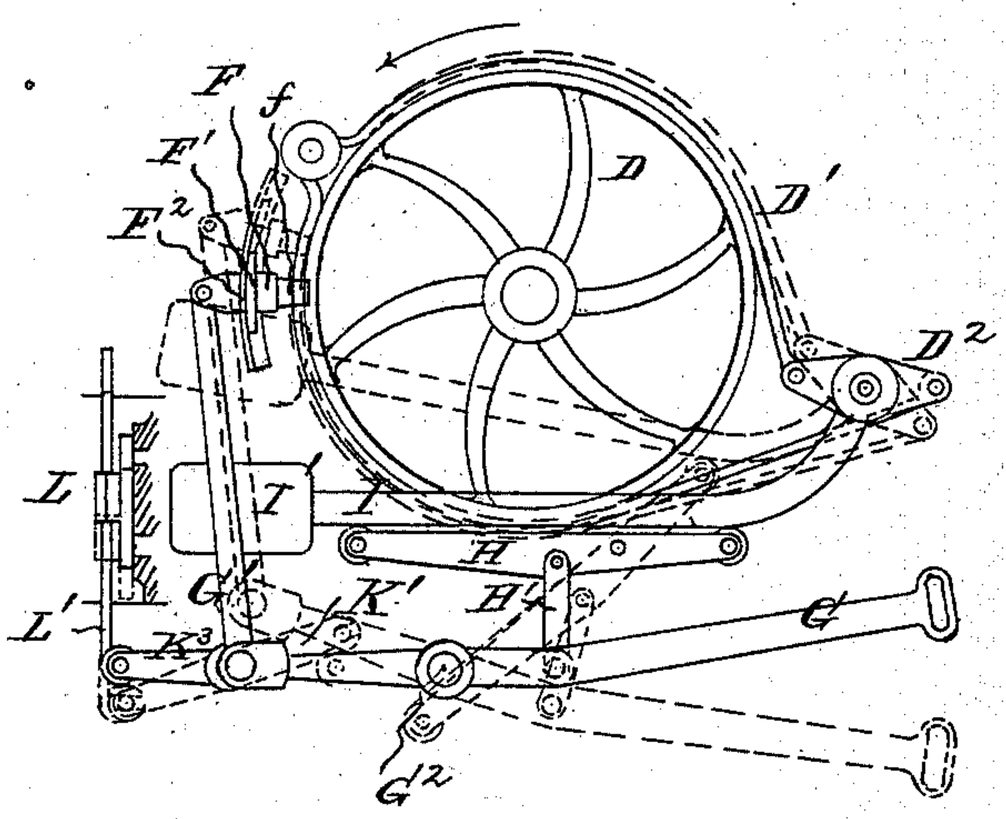

Fig. 3.

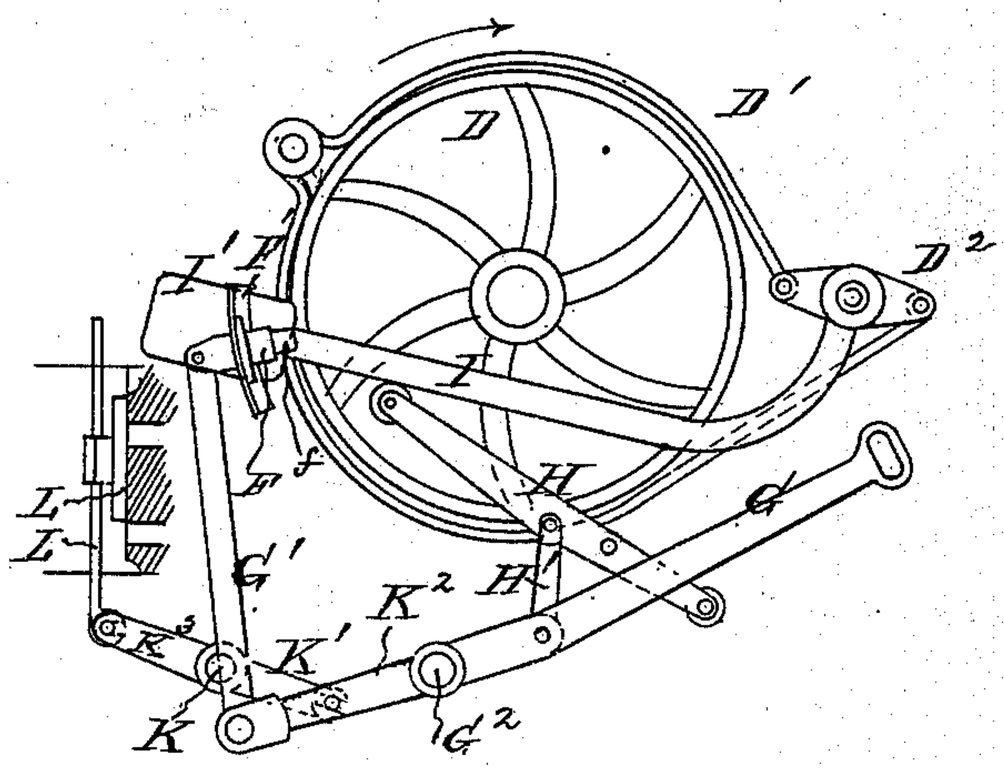

Fig. 3'.

Witnesses.

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4 Sheets--Sheet 3.

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Hoisting-Machines.

No. 146,492.

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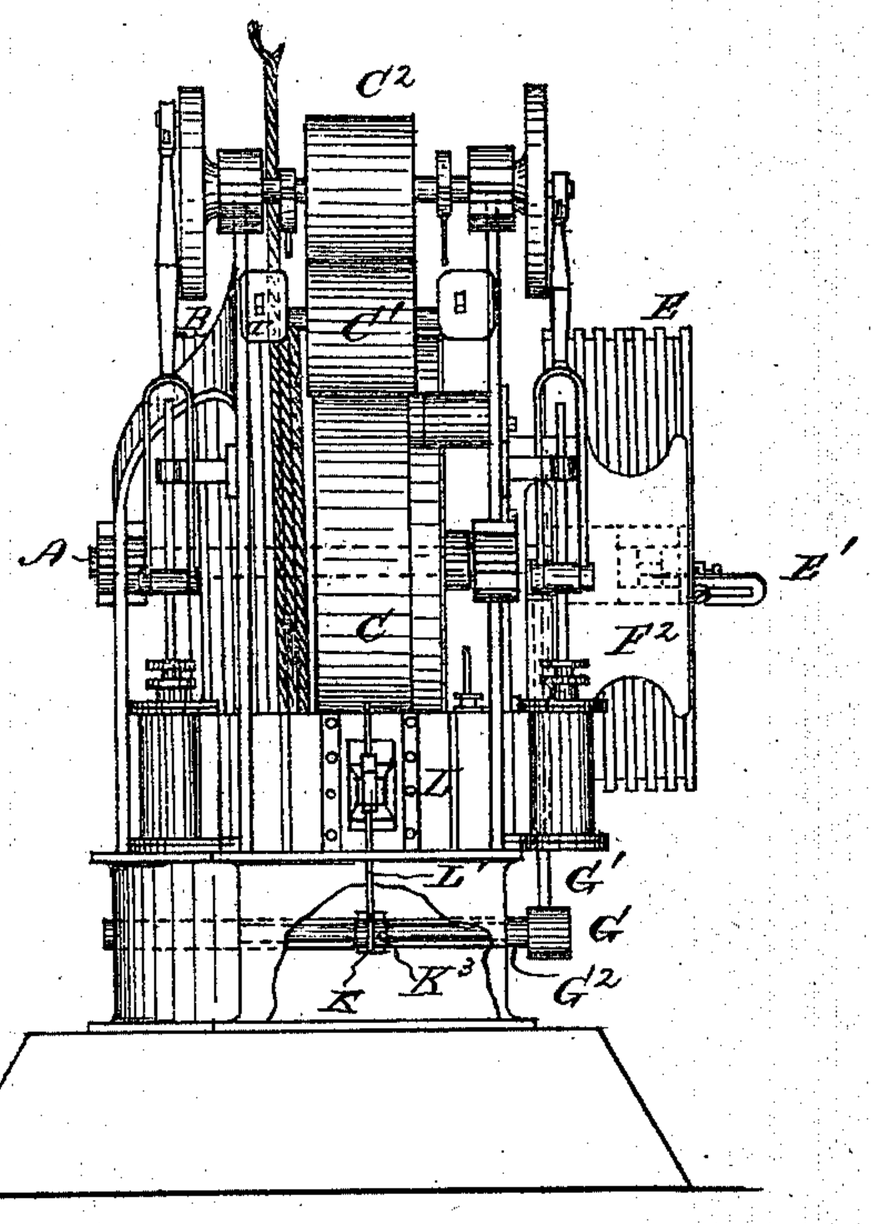


Fig 4.

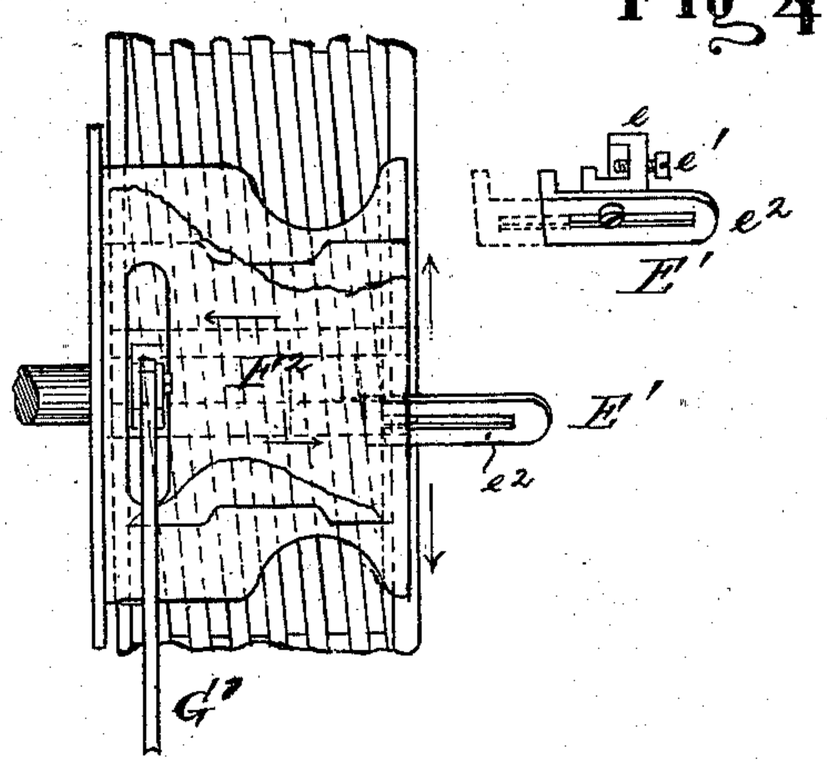
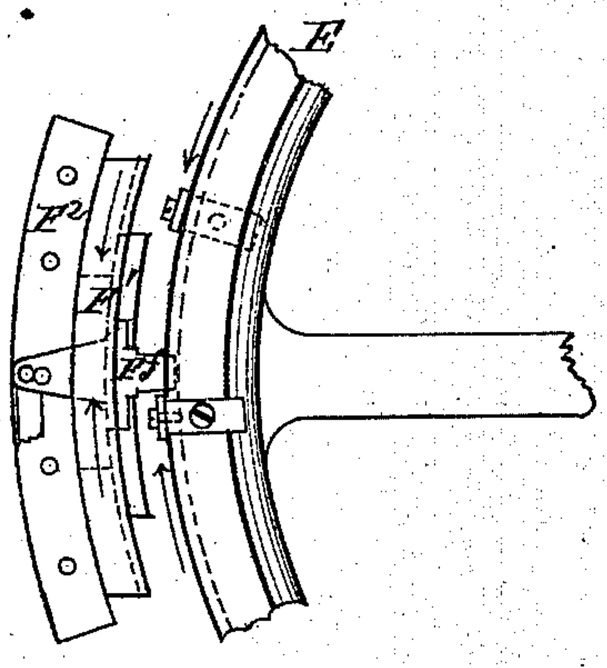


Fig. 5.



Witnesses.

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4 Sheets--Sheet 4.

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Hoisting-Machines.

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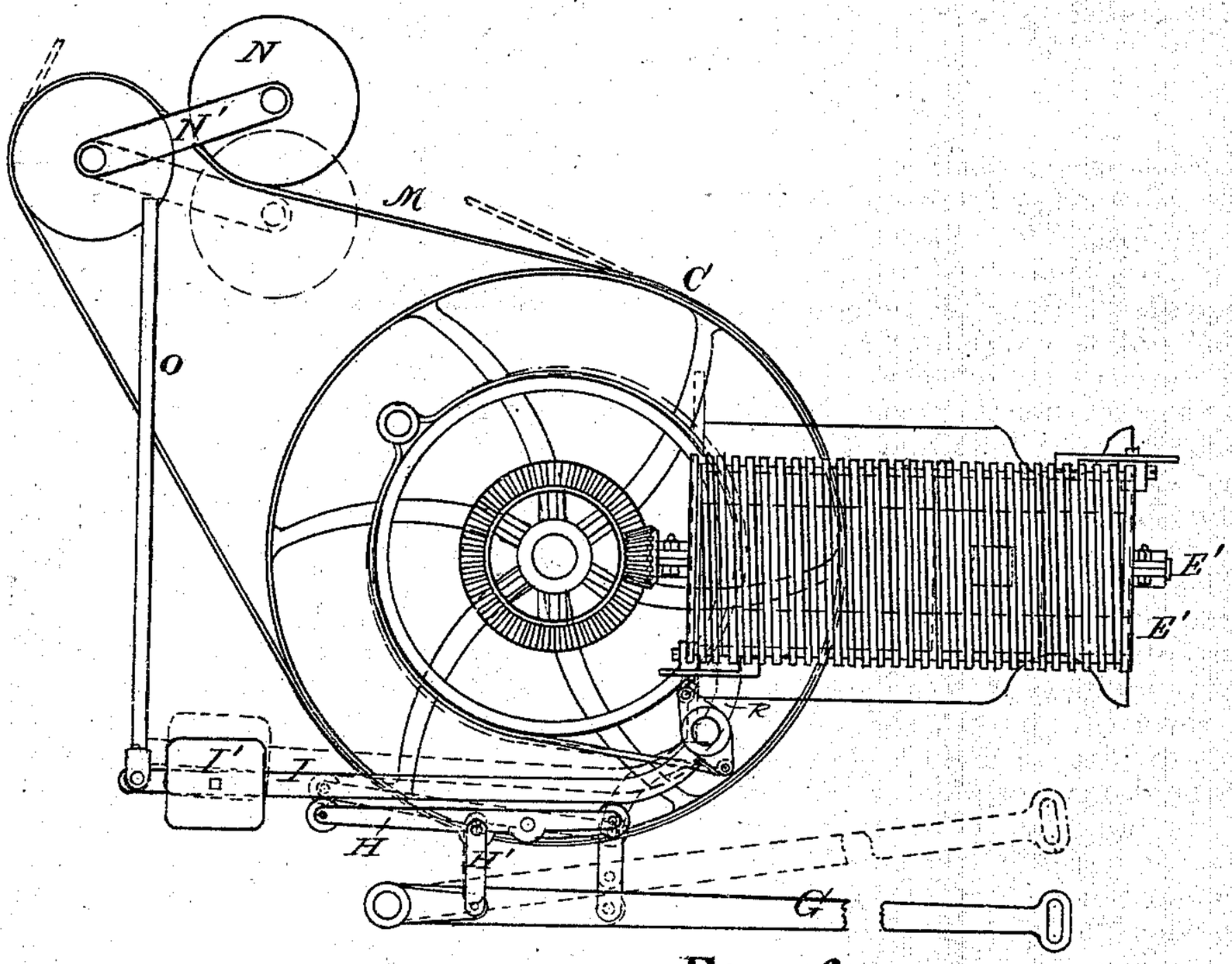

Fig. 6.

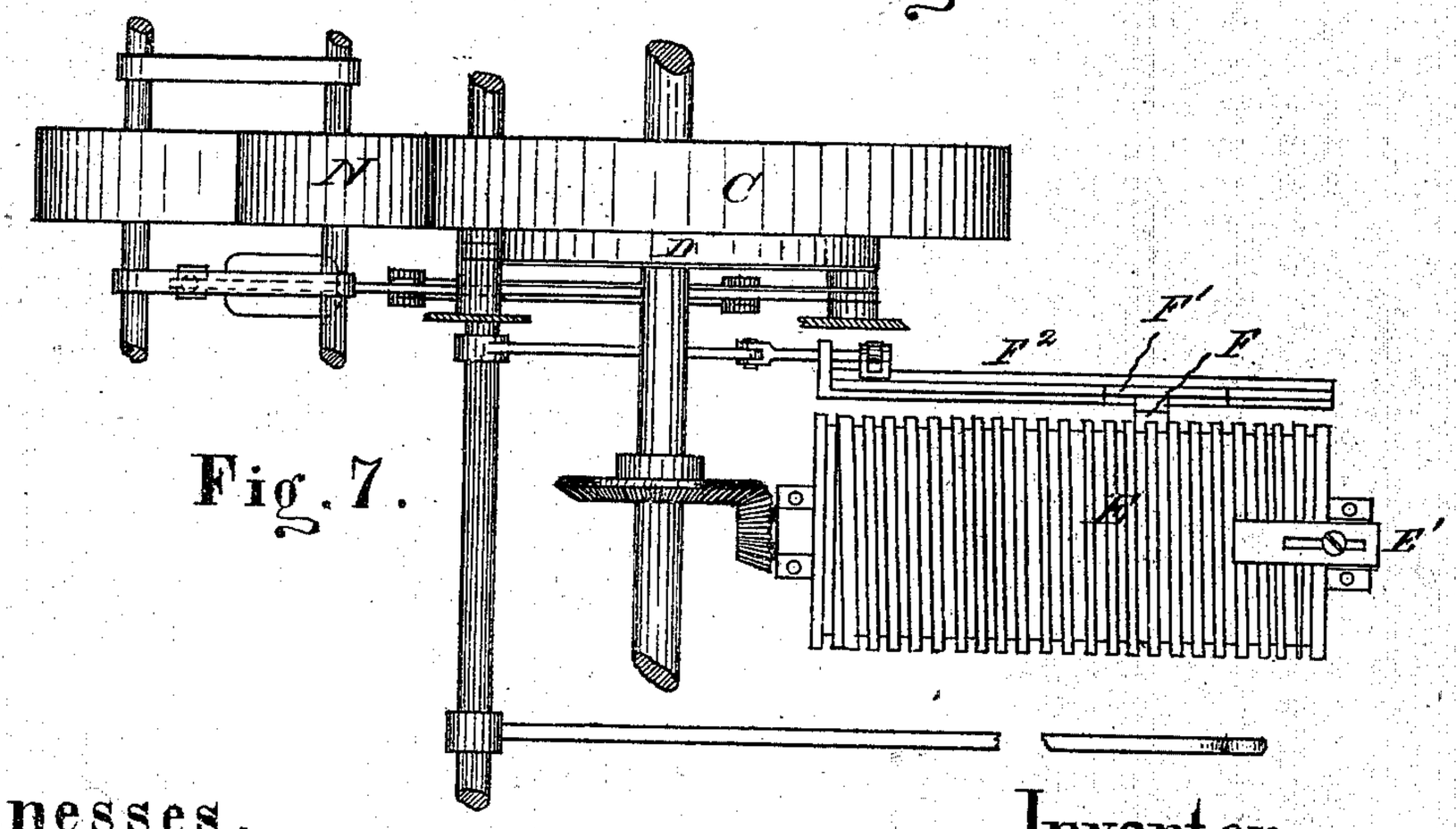

Fig. 7.

Witnesses.

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UNITED STATES PATENT OFFICE.

GUSTAVUS C. TIMPE, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN HOISTING-MACHINES.

Specification forming part of Letters Patent No. **146,492**, dated January 13, 1874; application filed August 2, 1873.

To all whom it may concern:

Be it known that I, GUSTAVUS C. TIMPE, of New Orleans, in the parish of Orleans and State of Louisiana, have invented certain Improvements in Hoisting-Machines, of which the following is a specification:

The object of my invention is to provide a mechanism for hoisting-machines, which will automatically stop both the ascent and descent of the car or platform at any desired point, and thus prevent all danger resulting either from overwinding or from unchecked descending when the operator has lost control of the machine by the breaking of the check-lines. My invention consists mainly in combining with any ordinary hoisting-machine or elevator a revolving spirally-threaded drum, or a screw, provided with shiftable stops, and acting through intermediate mechanism, so as to apply the brake at the desired points in the ascent and descent of the platform or car, suitable connection being also made with the slide-valve, when the hoisting-machine is operated by a steam-engine direct, to shut off steam simultaneously with applying the brake.

Figure 1 is a side elevation of a hoisting-machine embodying my improvements. Fig. 2 is a plan view of the same. Figs. 3 and 3′ are detail views representing the mechanism intermediate between the screw or spirally threaded drum and the brake and slide-valve. Fig. 4 is an end elevation of the machine shown in Figs. 1 and 2. Fig. 5 represents in detail the spirally-threaded drum or screw, its adjustable and shiftable stops, the sectoral or segmental ways, and the slide through which the system of levers and connections controlling the brake and slide-valve is actuated. Figs. 6 and 7 represent my invention applied to a hoisting-machine operated from a line of shafting.

The same letters of reference are used in all the figures in the designation of identical parts.

In the example illustrated in the first five figures of the annexed drawings, the main shaft A of the hoisting-machine is driven by friction-pulleys C, C^1, and C^2, the latter of which is keyed to the driving-shaft of a double cylinder steam-engine. The idler-pulley C^1 turns in bearings which are automatically adjusted, to preserve the contact of the pulleys with one another, by weighted arms or levers C^3. The main shaft A, carrying the hoisting-drum B and the brake-wheel D, projects through its bearing upon the side of the brake-wheel, and carries on this overhung end a drum, E, the surface of which is threaded spirally from end to end. This spirally-threaded drum acts upon the projection *f*, which enters between its threads, to move the slide F back and forth, according as it revolves in one direction or the other. This slide F moves in horizontal ways of the plate F^1, which is arranged parallel to the surface of the drum to slide in a vertical arc in ways formed in the side of the frame of the machine, and the outer side of the segmental flange F^2 thereof. The sliding plate F^1 is linked to the short arm of the check-lever G, by means of the connecting-rod G^1. The check-lever is fixed on the overhung end of the rock-shaft G^2, which carries an arm, H^2, connected by the rod H^1 to one arm of the rocking beam H, which turns on a stud projecting from the frame of the machine. The rocking beam carries at each end, on a laterally-projecting stud, an anti-friction roller, *h*, upon which the arm I, which is secured at one end to the coupling D^2 of the strap D^1 of the brake-wheel, is supported. The outer end of the arm I carries a weight, I′, sufficiently ponderous to apply the friction-strap to the brake-wheel with proper force, to stop the rotation of the main shaft of the hoisting-machine, when it is allowed to descend.

When the brake is applied, as shown in Figs. 1 and 3, the weighted arm I rests upon both ends of the rocking beam H, which then assumes a nearly-horizontal position, and holds the sliding plate F^1, through the intermediate connections, in a central position in the segmental ways which sustain it. By turning the check-lever G up or down, the weighted arm I is lifted by one end or the other of the rocking beam H, whereby the strap D^1 is opened and the friction removed from the brake-wheel, so that the machine may operate either to elevate or lower the car or platform, as the case may be.

The spirally-threaded drum E is provided at each end with an adjustable and shiftable stop, E′, which, as the slide F approaches either end of

the drum, strikes its projection *f*, and shifts the sliding plate F^1, together with its lateral slide F *f*, from its respective extreme position at one end or the other of its ways to a central position, which will arrange the parts, as best seen in Fig. 3, applying the brake by means of the weighted arm I, and stopping the machine. The stops E′ consist of a clip, *e*, which embraces the outer thread of the drum, and can be secured at any desired point of its circumference by a set-screw, *e*^{1}, and a slotted arm, *e*^{2}, the inner end of which may have a lip to hook into the channel between the threads, and which can be adjusted laterally on the clip across the face of the drum. By adjusting this arm and shifting the entire stops, the means are provided for automatically applying the brake after the main shaft and hoisting-drum have made the required number of revolutions to lift or lower the load the necessary distance. Both the spirally-threaded drum and the adjustable arms of the stops may be graduated to facilitate their adjustment. The check-lever is controlled by the ordinary check rope or ropes, by which the machine may be started and also stopped at intermediate points. The rock-shaft G^2 is connected by arms K^2 and K^1 to a parallel rock-shaft, K, the arm K^3 of which is pivoted to the stem L^1 of the slide-valve L, which controls suitable steam-ports and governs the admission of steam to the cylinders in such a way that the engines may be reversed at will by suitably operating the check-lever G. The valve is so connected with the brake-mechanism that simultaneously with applying the brake steam will be shut off.

In Figs. 6 and 7 I have shown my invention as applied to a machine driven from a line of shafting through a belt, M, and the spirally-threaded drum is carried on a counter-shaft, geared to the main shaft of the hoisting-machine.

All the main features of my improvements, as heretofore described, are retained, and only slight modifications in the arrangement of the various parts are made, necessitated by the new conditions. The driving-belt is kept taut by the gravitating belt-tightener N, pivoted by means of arms N, to the driving shaft.

To guard against accidents which might result from the breaking of the belt, I pivot a rod, O, to the outer end of arm I, and arrange it to stand with its upper end directly under one of the arms of the belt-tightener, so that, in case the belt breaks, the belt-tightener will bear down on this rod, and, pushing it downward, turn the arm I so as to apply the brake. The rod O should be supported by a suitable guide.

It is desirable to have the spirally-threaded drum or screw travel at the surface as many feet in a given time as the surface of hoisting-drum, or, better still, a little faster. This is easily accomplished by making this drum just a trifle larger in diameter than the hoisting-drum, when both are mounted on the same shaft; and where they are placed upon different shafts this relative surface speed may readily be obtained by gearing up or down, as the case may be. The drums of hoisting machines for mines being sometimes of very large diameter, the spirally-threaded drum when applied to such may be made in segments.

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

1. The brake of a hoisting-machine, in combination with a spirally-threaded drum or screw and intermediate mechanism to automatically apply the brake at any given point, substantially as specified.

2. The combination of the spirally-threaded drum or screw E, stops E′, lateral slide F *f*, and sliding plate F′, suitably connected to the brake mechanism, substantially as and for the purpose specified.

3. The combination of the spirally-threaded drum or screw E, stops E′, lateral slide F *f*, sliding plate F′, rod G^1, check-lever G, rock-shaft G^2, arm H^2, link H^1, rocking-beam H, and weighted arm I I′ of the friction-strap of the brake-wheel, substantially as and for the purpose specified.

4. The shiftable and adjustable stops E′, composed of the clips *e* *e*^{1} and slotted arms *e*^{2}, substantially as and for the purpose specified.

5. The brake-wheel of a hoisting-machine and reversing-valve of a steam-engine, in combination with a spirally-threaded drum or screw and intermediate mechanism to automatically both apply the brake and shut off steam at any given point in the revolutions of the hoisting-drum, substantially as specified.

6. The combination of the belt-tightener N N′, rod O, and weighted arm I I′ of the friction-strap of the brake-wheel, substantially as specified.

In testimony whereof I have hereunto signed my name this 2d day of July, 1873, in presence of two subscribing witnesses.

GUSTAVUS C. TIMPE.

Witnesses:

C. TIMPE,

JOSEPH WALKER.