

G. B. MASSEY & A. B. DARLING.
Hoisting Apparatus.

No. 143,519.

Patented Oct. 7, 1873.

Fig. 1.

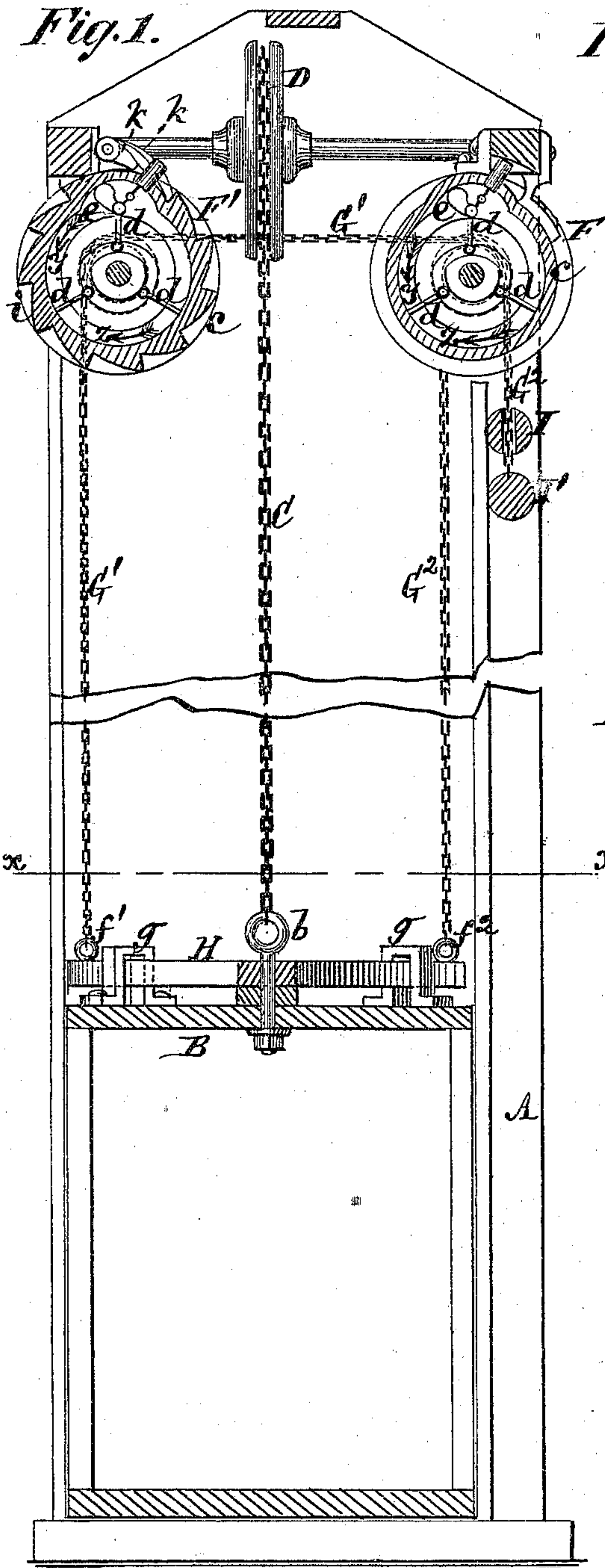


Fig. 2.

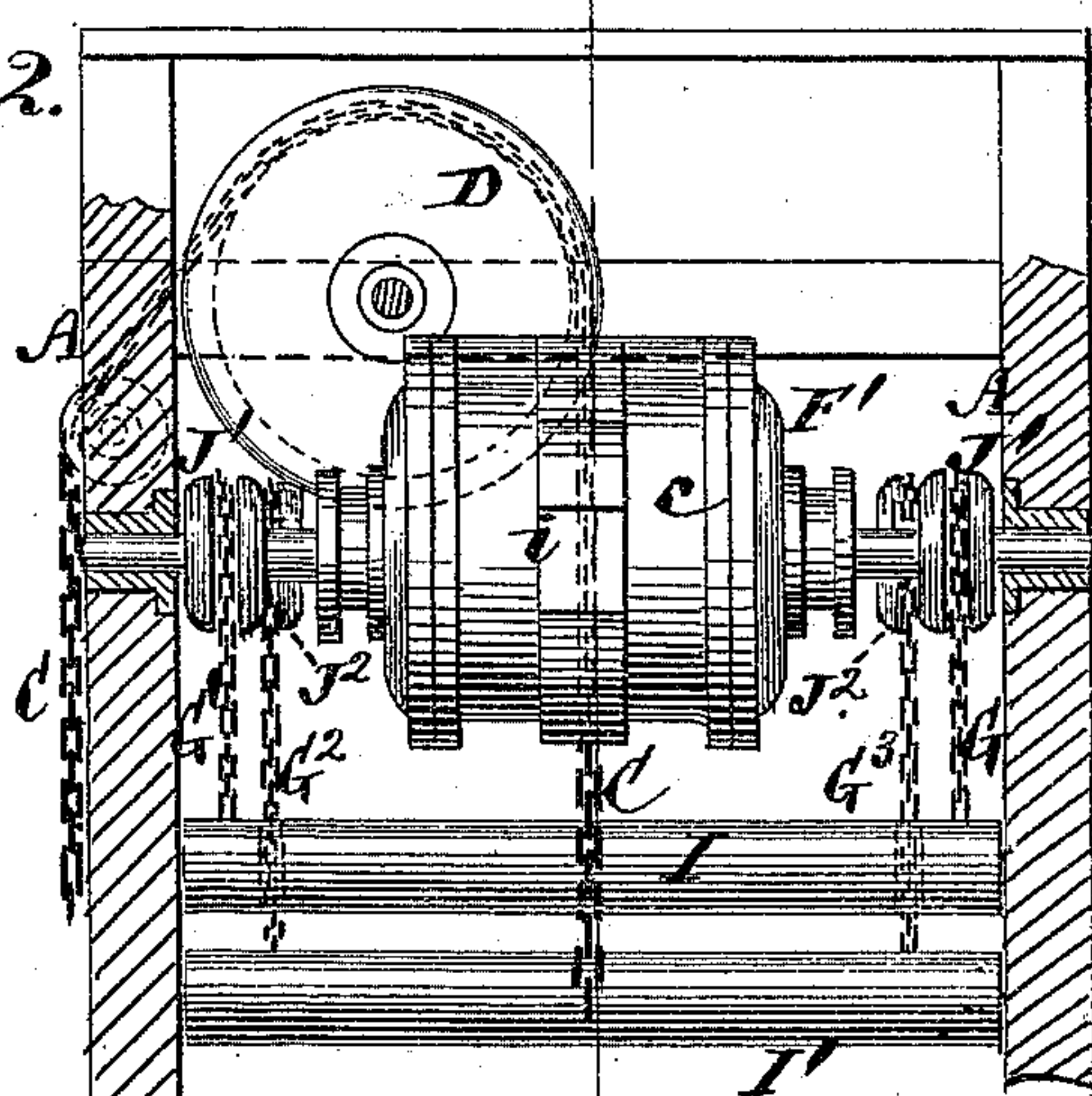


Fig. 3.

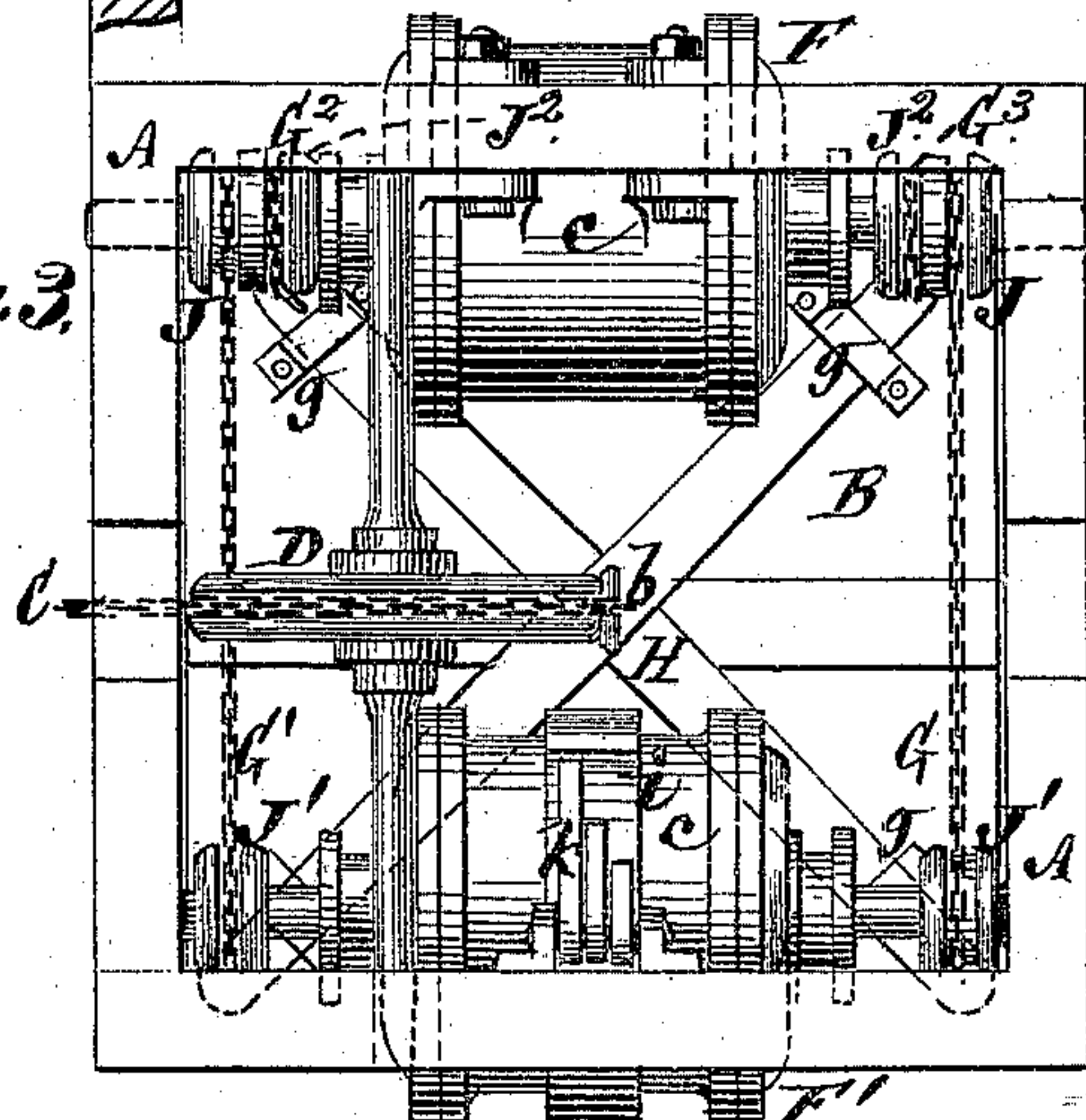


Fig. 4.

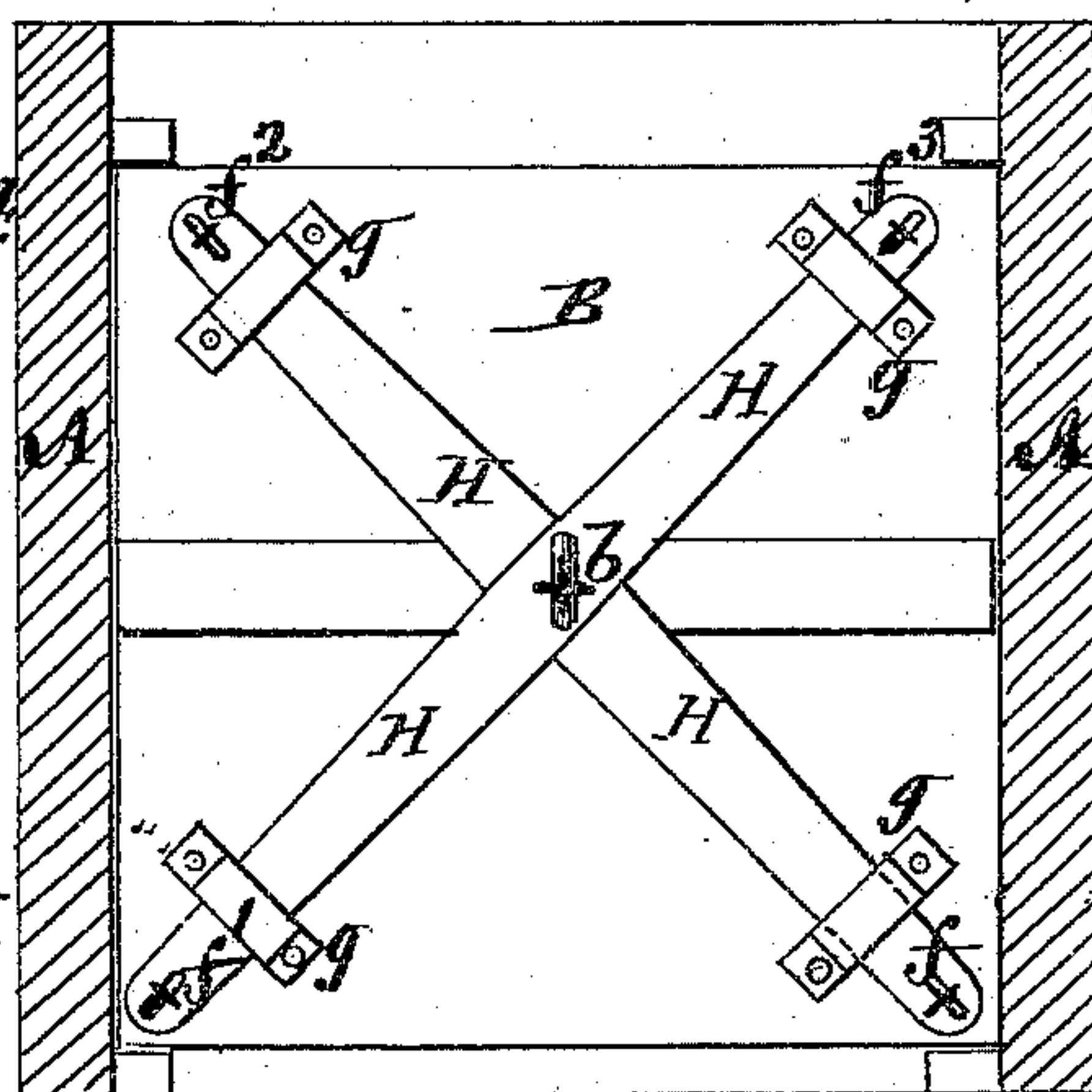
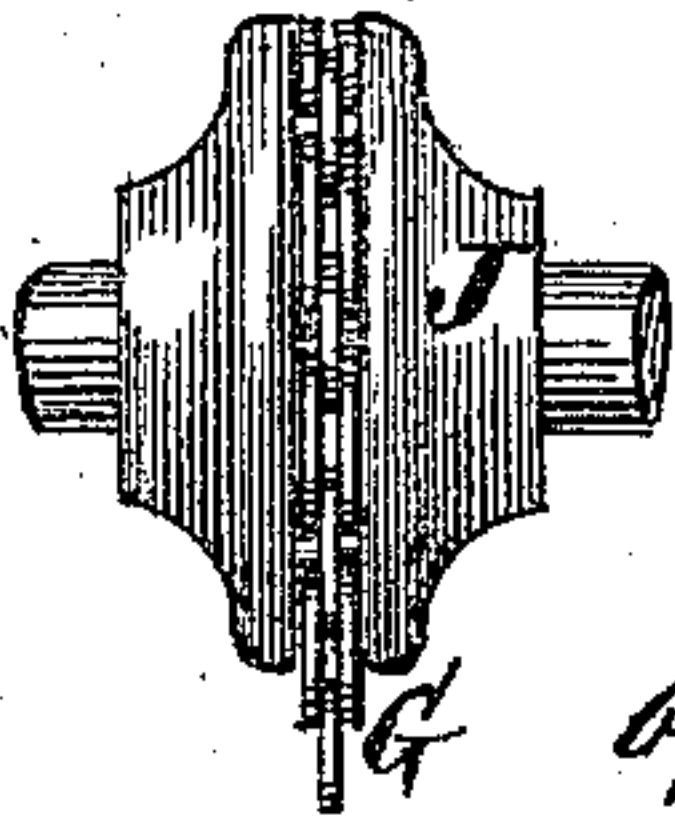
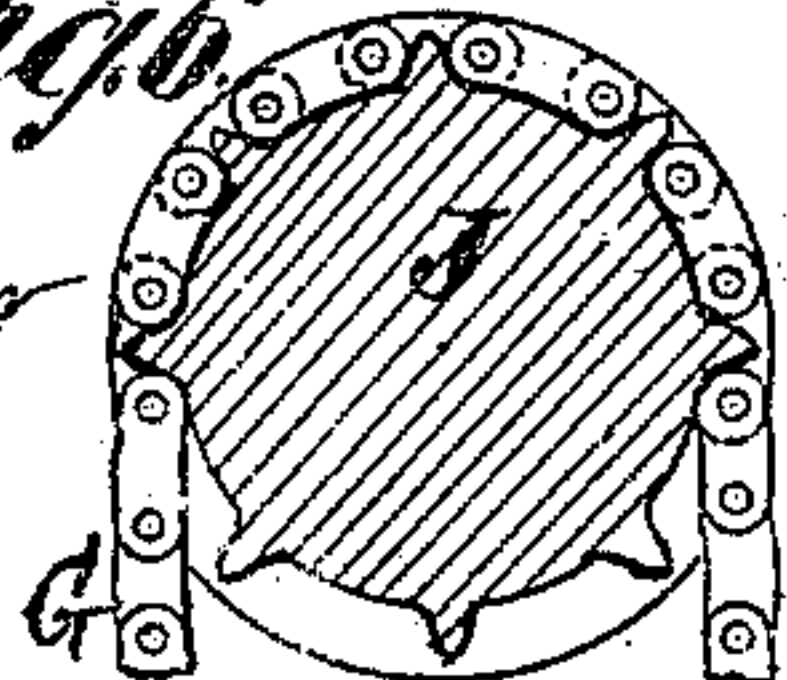


Fig. 5.



Witnesses. Fig. 6.

John Becker
Fred Harper



G. B. Massey
and A. B. Darling
by Atty. Brown & Allen

UNITED STATES PATENT OFFICE.

GIDEON B. MASSEY AND ALFRED B. DARLING, OF NEW YORK, N. Y.

IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. 143,519, dated October 7, 1873; application filed August 4, 1873.

To all whom it may concern:

Be it known that we, GIDEON B. MASSEY and ALFRED B. DARLING, both of the city, county, and State of New York, have invented certain Improvements in Hoisting Apparatus, of which the following is a specification:

This invention relates in part to the employment of a fluid retarder, or retarder to a hoisting apparatus, for controlling the descent of the car or traveling platform by gravity, substantially as described in an application for patent by the above-named MASSEY, filed July 19, 1873. The invention consists in a combination, with the car or platform arranged to descend by gravity, of one or more fluid retarders, constructed and arranged for operation so that the same only presents a controlling resistance during the descent of the car, but is relieved from resistance and much friction while the car is ascending by reason of the outer cylinder or case then moving in common and in the same direction with the piston or resisting-surfaces of the retarder. The invention also consists in a combination, with the car or traveling platform and with one or more retarders applied thereto, of counter-balances connected by chains with the platform, and arranged to pass over and gear with pitched wheels, whereby said chains are made to drive the retarders and so secure the safety of the car, or restrict its descent beyond the velocity to which the retarders may be set to limit it, and the counter-balances operate to keep the driving-chains of the retarders permanently in their places or from slipping. These chains, with their attached counter-balances, constitute safety chains or appliances, and are altogether independent of the hoisting rope or chain; and the invention furthermore consists in a certain arrangement of said chains in relation with a cross-tree secured to the center of the car, whereby, in case of any one of said chains breaking, the car will be prevented from tipping.

In the accompanying drawing, which forms part of this specification, Figure 1 represents a vertical section of a hoisting apparatus having my invention applied. Fig. 2 is a partly sectional elevation, at right angles to Fig. 1, of the upper portion of said apparatus. Fig. 3 is a plan of the working portion of the ap-

paratus; Fig. 4, a horizontal section on the line *xx*; and Figs. 5 and 6, an edge view and transverse section of one of the pulleys by which the retarders are operated, and chain in gear with the same.

Similar letters of reference indicate corresponding parts.

A A are the sides or uprights of the hoistway, and B the car or traveling platform, to which the lifting rope or chain C has a positive attachment in the center, at *b*, and from which it passes up to and over a pulley, D, from whence it passes to the hoisting-drum below. This hoisting-chain C is totally independent of the safety-chains, and may accumulate slack by catching of the car in the hoistway, or otherwise, without affecting the action of the safety-chains, that are only paid out in proportion to the descent of the car by gravity. F F' are rotary fluid retarders, constructed upon the principle of a Massey or any other suitable rotary engine, but each of which is here shown as consisting of a cylinder, *c*, revolving radial pistons *d*, and a pivoted abutment, *e*, arranged to occupy a tangential or oblique relation to the circular travel of the pistons, and controlled by a rod and spring, the tension of which latter should be adjustable to suit different resistances or velocities required. We do not, however, restrict ourselves to this particular construction of retarder, the object of which is to have a controlling effect upon the car B when the latter is being lowered. Said retarders F F' are filled with oil or any other suitable fluid, and when their pistons travel in direction of the arrow *y*, which is when the car B is descending; and in proportion to the quantity of fluid permitted to pass the abutments will the speed of the descending car be determined. These retarders are connected with the car B by or through safety-chains G G¹ G² G³, arranged to form attachment with the car at its several corners, at *f f¹ f² f³*, by or through a cross-tree, H, which is pivoted at its center to the car, and braced at or near its extremities, in the vicinity of the corners of the car, by bridges *g*. The chains G G¹ have attached to their one end a counter-balance, I, and pass over wheels or pulleys J J on the shaft of the one retarder, F, and over other wheels, J¹ J¹, on the shaft of the

other retarder, *F*, down to the cross-tree *H*, where said chains are attached at their opposite ends at two points, *f f*¹, while the other two chains, *G*² *G*³, have attached to their one end a separate counter-balance, *I'*, and, after passing over wheels *J*² *J*² on the shaft of the retarder *F*, are connected at their opposite ends to the cross-tree *H* at the points *f*² *f*³. These several wheels, *J* *J*¹, and *J*² are toothed or studded as well as grooved, in order that the chains *G* *G*¹ *G*² *G*³ may not only be properly guided, but so that said chains, which are suitably pitched, will gear with them, and thereby become the drivers of the retarders *F* *F'*, the counter-balances *I* *I'* serving to keep the chains in their places and from slipping. In this way the car descending by gravity has its speed, in lowering, effectually regulated by the retarders, and the arrangement of the chains *G* *G*¹ *G*² *G*³ and equalizing action of the pivoted cross-tree *H*, as regards division of the strain, is such that, even should one of the chains break, or any two thereof connected with diagonally opposite corners of the car, or, rather, of the pivoted cross-tree *H*, the car would not only still be sustained, but all side tilting or tipping of it be avoided; and the cross-tree *H* further serves to insure regularity of speed at the different corners of the car, should there be any slight difference in diameter of the pitched chain wheels or pulleys *J* *J*¹ *J*².

To do away with all resistance of the retarders and friction consequent upon rotation of the fluid therein when the car is ascending, said retarders may be constructed as the one *F'* of them is represented—that is, with

its cylinder or case *c* and attached abutment *e* free to revolve in common and in like direction with its piston *d* when the car is moving upward, but so that said cylinder is locked from revolving when the car is making its descent, in order that it may then exert its proper retarding effect. This freedom of the cylinder *c* to revolve in the one direction, but not in the other, is obtained by means of a ratchet, *i*, in or connected with the cylinder and any number of pawls *k* biting therein.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination, with the car or platform arranged to descend by gravity, of one or more rotary fluid retarders, connected with the car by safety ropes or chains, and in which the outer cylinder or case of either retarder is free to move in common with its piston when the car is ascending, but is locked from moving when the car is descending, substantially as and for the purpose herein set forth.

2. The combination, with the retarders, of counter-balances connected by chains with the car and pitched wheels on the shafts of the retarders, whereby the chains are made to operate the retarders, substantially as specified.

3. The safety-chains *G* *G*¹ *G*² *G*³, arranged in relation with the car as described, in combination with the centrally-pivoted cross-tree *H* and car or traveling platform *B*, essentially as herein set forth.

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ALFRED B. DARLING.

Witnesses:

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