

J. L. ISBELL.
Hoisting Apparatus.

No. 138,655.

Patented May 6, 1873.

fig. 1.

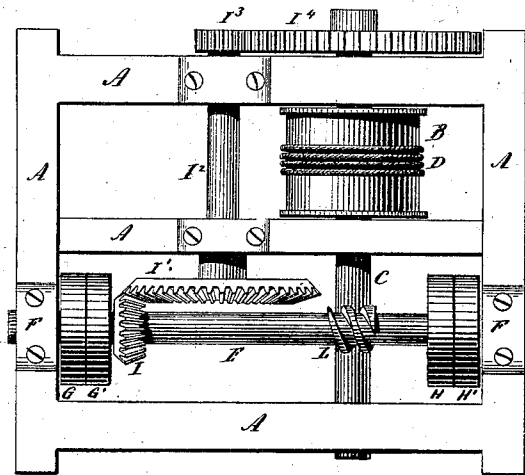


fig. 2.

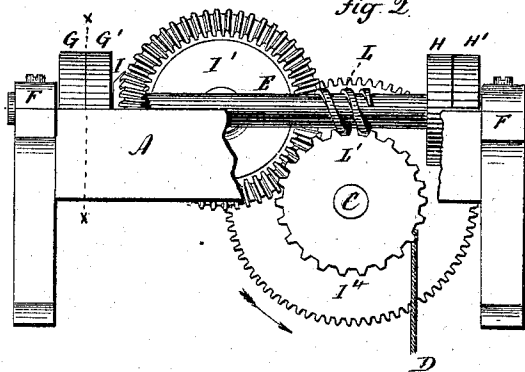
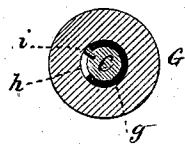


fig. 3.



Witnesses.

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IMPROVEMENT IN HOISTING APPARATUS.

Specification forming part of Letters Patent No. **138,655**, dated May 6, 1873; application filed April 16, 1873.

To all whom it may concern:

Be it known that I, JOHN L. ISBELL, of Naugatuck, in the county of New Haven and State of Connecticut, have invented a new Improvement in Hoisting Apparatus; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents, in—

Figure 1, a top view; Fig. 2, a front view with a portion of the frame broken away; and in Fig. 3, a transverse section through the pulleys on line *x x*.

This invention relates to an improvement in hoisting apparatus, the object being such a construction as will automatically prevent the running down of the fall in case of accident; and the invention consists in a drum carrying the fall, combined with a driving-shaft provided with means for communicating power thereto in opposite directions, and with intermediate gearing between the said shaft and drum, whereby power is communicated to the drum to raise or lower the fall, the gearing which lowers the fall being a worm and each of said gearings proportioned for equal velocity, and a slight amount of lost motion provided on one chain of gearing, all as more fully hereinafter described.

A is the frame-work which supports the mechanism. B is the drum, arranged upon a shaft, C, and supported in suitable bearings. Upon this drum the fall D is secured, so that, by turning the drum in one direction, the fall is wound thereon, and in the other direction the fall is run off, in substantially the usual manner. E is the driving-shaft, preferably arranged transversely to the shaft C, and is supported in bearings F. Upon this shaft are two pairs of pulleys, G G' and H H', one of each pair, G' and H', being loose pulleys. The pulley H is securely attached to the shaft. The pulley G is attached to a sleeve, *g*, through which the shaft runs, but so as to leave the pulley and the sleeve loose upon the shaft. In this sleeve is a slot, *h*, and in the shaft is a stud, *i*, extending into this slot, so that the said pulley, in turning, will engage the shaft, but allow a lost motion to the extent of the

slot *h*, for the purpose more fully hereinafter described. Upon the driving-shaft a pinion, I, works into a pinion, I', on a transverse shaft, I², connecting to the drum by a pinion, I³, and gear I⁴. Power applied to the pulley G will, through this chain of gearing, cause the drum to revolve in the direction to wind up the fall, such direction being denoted by the arrow in Fig. 2. On the driving-shaft over the shaft C a worm, L, is arranged to work into a worm-gear, L'.

Power is applied to the pulley H to cause the worm to rotate the drum in the opposite direction to the first-described gearing, the rotation of the shaft E being reversed, the worm being used for the lowering of the weight. The proportion of the worm and the pinion I to their respective gearing is the same, so that if both sets of pulleys are firmly attached to the shaft both chains of gearing will be turned by means of either pulley. That such may not be the result, and that one may always be a little in advance of the other, is the purpose of the lost motion provided for by the slot *h*.

It will be understood that the power is applied to but one of the pulleys at the same time, and that when the fixed pulley of one pair is at work the belt will be upon the loose pulley of the other; hence, when power is applied to the pulley G to raise the weight the lost motion gives it a little advance of the worm and allows the worm to work freely and without effect upon its wheel L', and when the power is shifted to the pulley H the lost motion in the pulley G allows the worm to run a little in advance, causing it to operate through its wheel L'.

When the power is working through the pulley G to raise the weight, should the power become disconnected, or similar accident occur, which would give the fall a tendency to run down, the power of the fall is brought, through the wheel L', directly upon the worm; and, as that power cannot cause the revolution of the worm, it follows that the descent is immediately arrested and the consequences of such an accident prevented, and in like manner serves as a brake to hold the load at any point.

I have represented the power as applied through the pulleys, but it will be readily un-

derstood that other known and equivalent means may be employed for communicating power to the shaft E.

I claim as my invention—

In combination with the drum B, the two runs or chains of gearing, one of which causes the revolution of the drum to wind or raise the fall, the other the revolution of the drum in the opposite direction to lower the fall, the latter by means of a worm, L, when the device

through which power is communicated in one direction is constructed to allow a slight over-motion independent of the other device for communicating power in the opposite direction, substantially as set forth.

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Witnesses:

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