(No Model.) 4 Sheets—Sheet 1.

W. H. LINDSAY.

WINDING MECHANISM FOR HOISTS.

No. 522,529. Patented July 3, 1894.

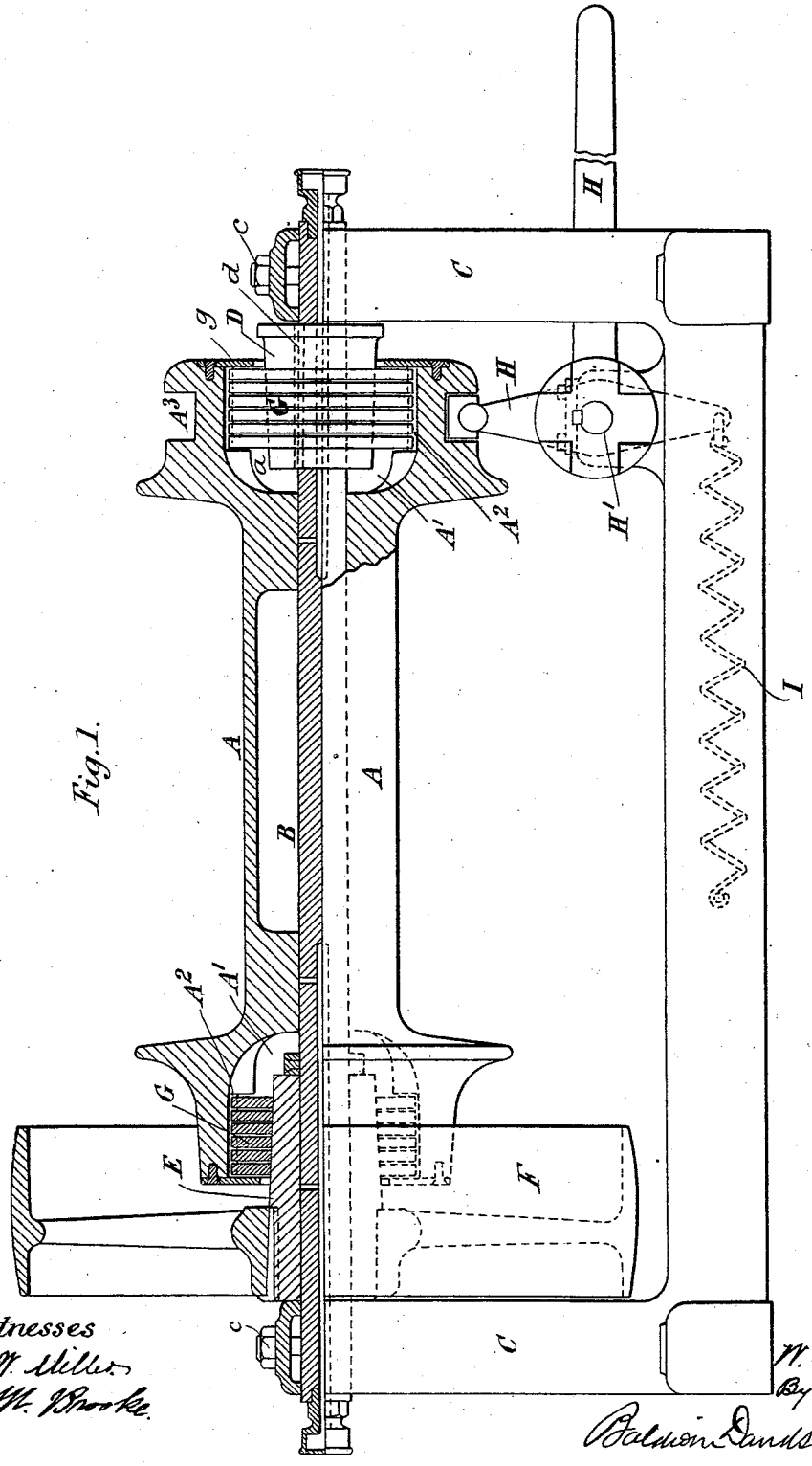

Fig. 1.

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(No Model.) 4 Sheets—Sheet 2.

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Fig. 2.

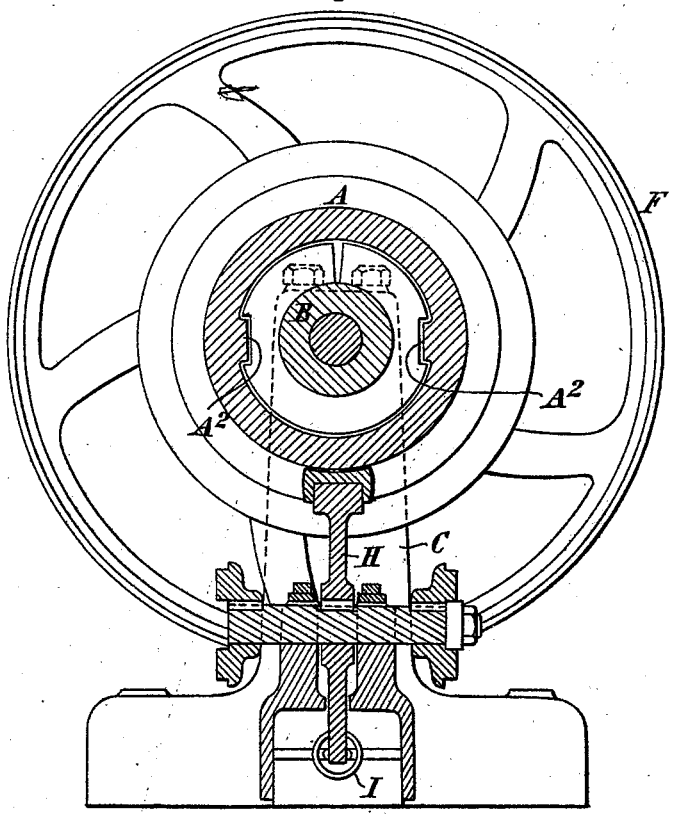


Fig. 3.

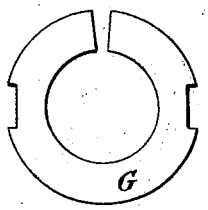
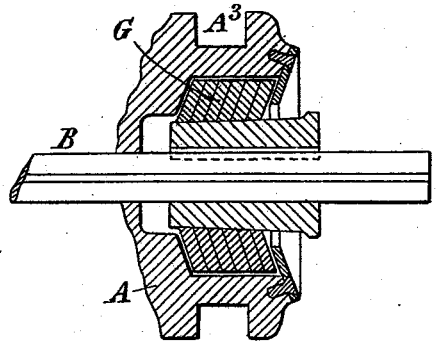


Fig. 4.



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WINDING MECHANISM FOR HOISTS.

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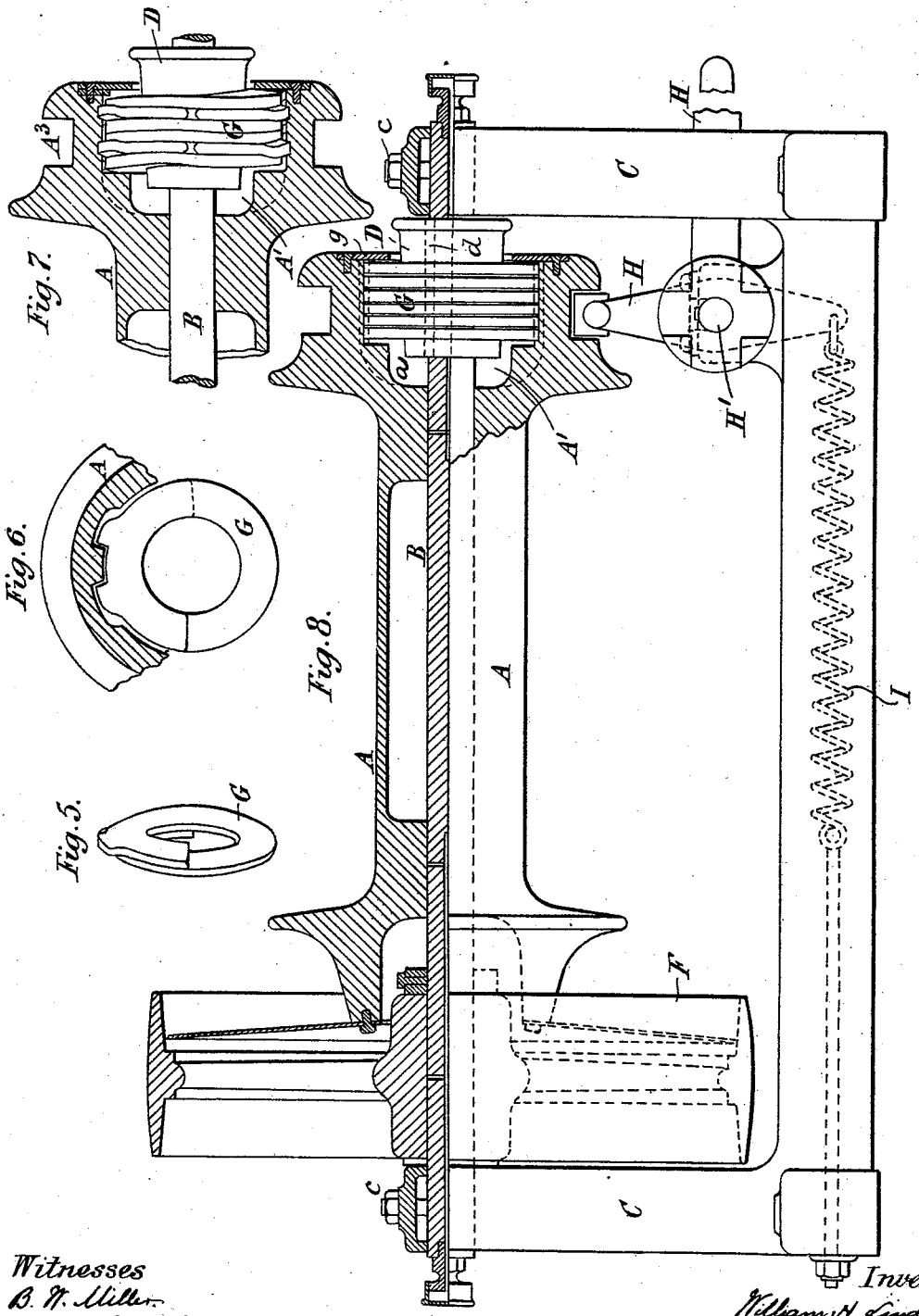

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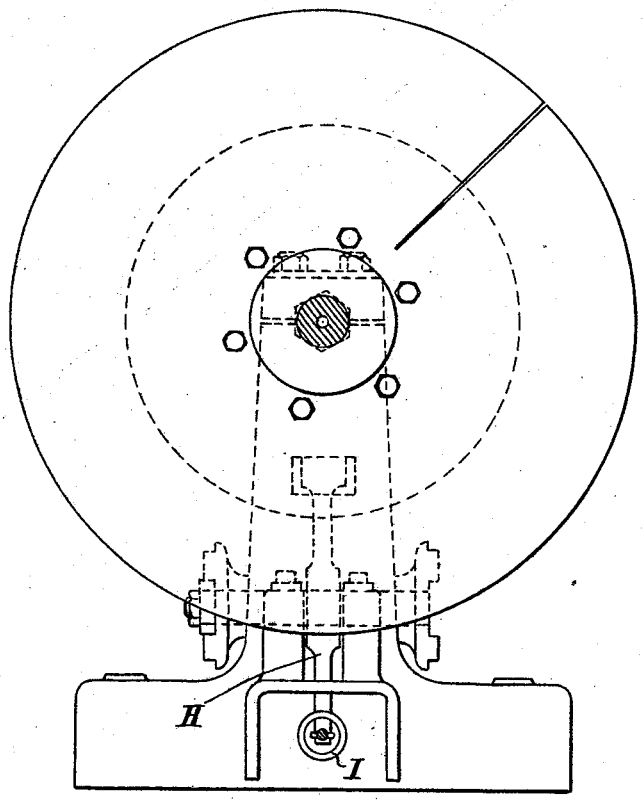
Fig. 9.



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UNITED STATES PATENT OFFICE.

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WINDING MECHANISM FOR HOISTS.

SPECIFICATION forming part of Letters Patent No. 522,529, dated July 3, 1894.

Application filed November 27, 1893. Serial No. 492,099. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY LINDSAY, engineer, a subject of the Queen of Great Britain, residing at Ashton Gate, Bristol, England, have invented certain new and useful Improvements in Winding Mechanisms for Hoists and Like Purposes, of which the following is a specification.

The winding mechanism is composed of a drum with flanged ends similar to those in ordinary use in crabs and winches whereon a chain or rope is to be wound. The drum is mounted upon an axis which at its ends is carried by fixed standards. On each end of the drum or barrel is cast a recessed chamber. A cone is made to project into each of these chambers—one of these cones projects from the hub of a driving pulley which turns loosely around the axis at one end of the barrel, the other is fast with the standard by which the opposite end of the axis is carried. The annular space between each cone and the sides of the chamber that it enters into is filled with a number of split metallic rings placed together side by side. The inner circumference of each ring is turned conical to fit the cone and the rings being split radially can expand slightly. The rings also have notches in their outer circumference into which feathers fast with the interior of the chambers enter to keep the rings from turning within the chambers. The barrel is free to be moved endwise to and fro a short distance along the barrel by means of a lever. The lever is acted upon by a strong spring which tends always to turn it in a direction to move the barrel away from the driving pulley. When it is held over in this direction it is disengaged from the driving pulley and the split rings which are contained in the chamber at the opposite end of the barrel are forced along the fixed cone which they embrace. The rings are in this way made to grip the cone tightly and act as a brake to lock the barrel and keep it from turning. When the barrel is forced endwise in the opposite direction by means of the lever the rings embracing the fixed cone are drawn toward the smaller end of the cone and so disengaged from it and then the split rings at the opposite end of the barrel which embrace the cone on the hub of the driving pulley are forced along this cone and similarly made to grip it and so the barrel is locked to the pulley and driven by it. When the barrel is held by the lever in an intermediate position the barrel is free both from the fixed cone and from the cone on the driving pulley and can turn freely around the axis. The rings may either be flat or they may be dished so as to overlap one another and give increased holding power. Other clutch mechanism may also be substituted for the split rings.

The drawings annexed show winding mechanism constructed according to my invention.

Figure 1 is a longitudinal section of one arrangement of the winding mechanism. Fig. 2 is a cross section of the same. Fig. 3 shows separately one of the split metallic rings. Fig. 4 shows the rings dished in place of being flat, as shown in Fig. 1. Fig. 5 shows one of the rings split obliquely instead of straight across. Fig. 6 shows a face view of such a split ring, with projections upon it entering recesses in a portion of the drum. Fig. 7 shows a side elevation of an assemblage of such rings, held in a chamber at one end of the drum. Fig. 8 shows a modification of the construction shown in Fig. 1. Fig. 9 is a vertical section through the left hand end of Fig. 8, with the driving wheel removed.

A is the winding drum, B a fixed axis around which the drum can revolve freely.

C C are standards by which the axis B is carried, and to which it is fixed by set screws *c*.

A′ A′ are hollow chambers in the ends of the drum A.

D is a cone or clutch member fixed to the shaft B, by key *d* and projecting into the chamber A′ at one end of the drum and E is a cone projecting into the chamber A′ at the other end of the drum and forming part of the hub of a pulley or wheel F which can turn freely around the axis B and is driven continuously by a band or otherwise.

G G are split metallic rings interposed between the cones D, E and the sides of the chambers A′. One of the rings is shown separately at Fig. 3.

A^2 are feathers projecting from the sides of

the chambers A′ and entering notches in the split rings to prevent them turning within the chambers.

A^3 is a groove formed around the exterior of the flange at one end of the drum A.

H is a three armed lever turning on a fulcrum at H′—the end of one arm enters the groove A^3. A strong spring I is connected to the opposite arm and tends always to move the drum toward the standard C which carries the fixed cone or clutch member D;—the third arm serves as a hand lever for moving the drum endwise in the opposite direction or for holding it in a central position as above explained.

In Fig. 4 I have shown how the split rings may be dished in place of being flat as shown in Fig. 1. In place also of the rings being slit radially as shown in Fig. 3 they may be formed with their ends overlapping as shown in Figs. 5, 6 and 7. Each then forms a portion of a coil—or each assemblage of split rings might be replaced by one single coiled bar which at its inner end was secured to the chamber A′.

Other forms of friction clutch mechanism may also be used in place of the split rings, and cone. For example a single dished disk slit radially may as shown in Figs. 8 and 9 be fixed to the end of the drum which is toward the driving pulley or wheel F so that when the drum is moved endwise toward this wheel the disk is flattened and its circumferential edge forced against the interior of the rim of the wheel as in the clutch mechanism described in the specification of my patent, No. 502,732.

It will be observed that the rings G are confined within the chamber by plates *g*, and that the movement of the rings relatively to the end of the drum A, or of the drum A relatively to the rings, in the other direction, is limited by the inner wall *a* of the chamber A′, so that in operation, when the drum is moved endwise on the shaft, the rings are moved endwise on the cones D or E, to cause their expansion or contraction, and to afford a tight connection between the drum and one of the cones, in one case stopping the rotation of the drum and in the other case connecting it with the rotating wheel F. The spring I, as above explained, tends to move the drum away from the wheel F, and in engagement with the fixed friction surface to keep the drum locked and prevent it from turning unless it is purposely released by the attendant shifting the hand lever. For safe working it is essential to use a spring to automatically keep the drum locked in this way.

What I claim is—

1. The winding mechanism herein described comprising a shaft or axis, a winding drum mounted to move endwise thereon, a continuously driven wheel mounted loosely on the shaft close to one end of the drum, expansible and contractible clutching devices for connecting the wheel and drum together, a fixed clutch member in proximity to the opposite end of the drum, expansible and contractible clutching devices for connecting this end of the drum with the fixed clutch member, a spring for moving the drum away from the continuously driven wheel and a lever for shifting the drum endwise either to keep it engaged with the driving wheel or to hold it in a central position with neither set of clutching devices in action.

2. The combination, substantially as hereinbefore set forth, of a stationary shaft or axis, a drum mounted to revolve thereon, and move endwise relatively thereto, a driving wheel mounted to revolve about the fixed shaft and having a clutch member provided with an inclined surface, a clutch member carried by the drum and adapted to engage with said inclined surface, another clutch member carried by the opposite end of the drum, and fixed or stationary friction clutching devices engaging therewith for the purpose specified.

3. The combination, substantially as hereinbefore set forth, of the driving wheel the shaft a drum mounted thereon, expansible and contractible friction rings mounted in recesses in the ends of the drum, a clutch member carried by the wheel and having an inclined surface engaging one of said friction rings, and a clutch member having an inclined surface held stationary and engaging the expansible friction devices at the opposite end of the drum.

4. The combination, substantially as hereinbefore set forth, of the shaft B, the drum A free to turn around or to be moved endwise on the shaft, and having a recess in each end, split metallic rings held within each recess, a wheel to be driven continuously mounted on the shaft close up to one end of the drum, a cone projecting from the hub of the wheel and entering the recess in the adjacent end of the drum and embraced by the split rings held therein, a fixed cone entering the recess in the opposite end of the drum, and embraced by the split rings held therein, a hand lever for shifting the drum endwise, and a spring acting on the hand lever tending always to move the drum endwise toward the fixed cone.

5. The combination, substantially as hereinbefore set forth, of a fixed shaft B, a drum A, mounted thereon and free to revolve and move endwise relatively thereto, a wheel to be driven continuously, mounted on the shaft, and free to turn thereon and having a hub projecting into a recess in the adjacent end of the drum, friction clutching devices for connecting the wheel to the drum, expansible clutching rings mounted in a recess in the opposite end of the drum, and a fixed cone or clutch member having an inclined surface with which the rings engage.

6. The combination of a shaft or axis, a continuously driven wheel mounted thereon, a winding drum also mounted on the shaft and free to move endwise relatively thereto, a clutch member carried by the continuously driven wheel, a stationary or fixed clutch member, yielding clutching devices mounted in recesses in opposite ends of the drum, and an operating lever engaging the drum to move it endwise.

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