(No Model.)

A. C. LIPPINCOTT.

REDUCING MECHANISM FOR STEAM ENGINE INDICATORS.

No. 589,358. Patented Aug. 31, 1897.

Fig. 1.

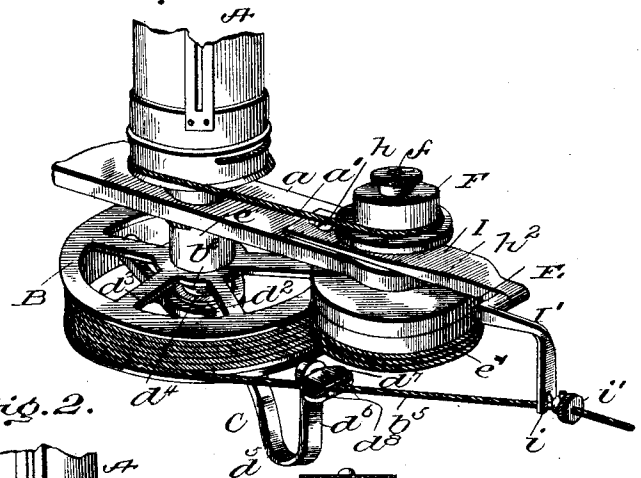


Fig. 2.

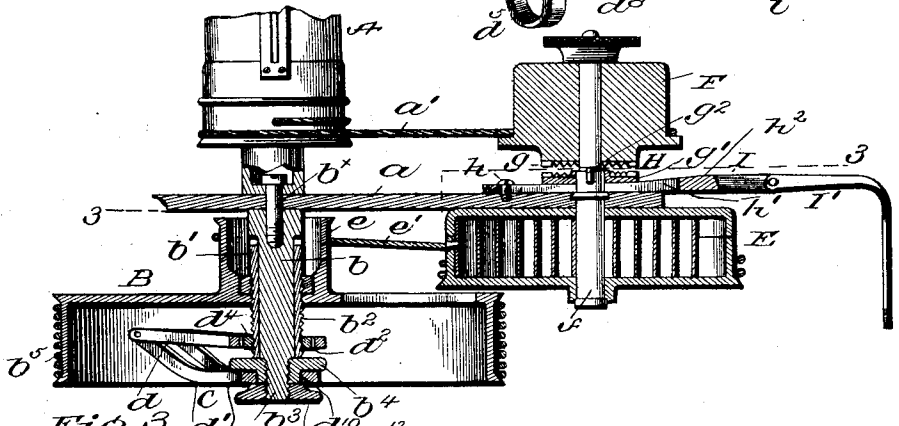


Fig. 3.

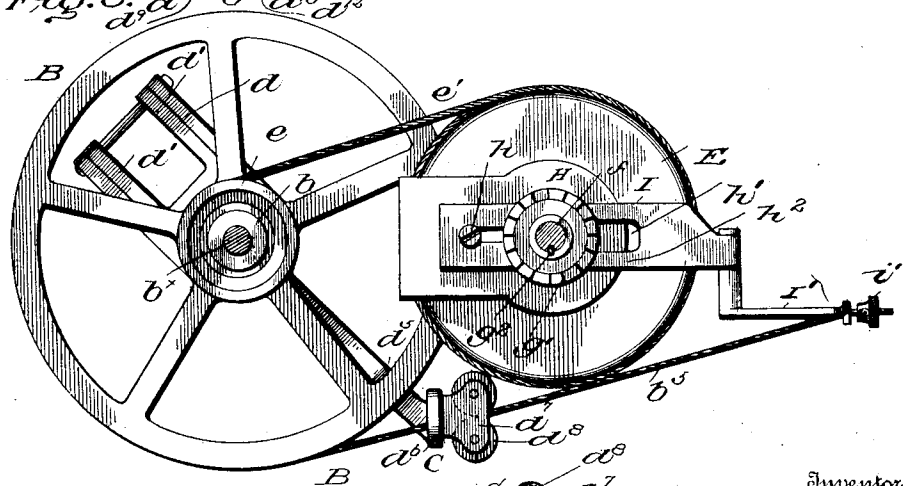
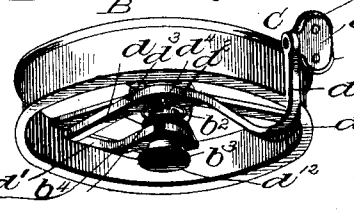


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALPHEUS C. LIPPINCOTT, OF NEW YORK, N. Y., ASSIGNOR TO JAMES L. ROBERTSON, OF SAME PLACE.

REDUCING MECHANISM FOR STEAM-ENGINE INDICATORS.

SPECIFICATION forming part of Letters Patent No. 589,358, dated August 31, 1897.

Application filed May 26, 1897. Serial No. 638,263. (No model.)

To all whom it may concern:

Be it known that I, ALPHEUS C. LIPPINCOTT, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Reducing Mechanism for Steam-Engine Indicators; 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.

This invention contemplates certain new and useful improvements in reducing mechanism for steam-engine indicators.

It is well known that more or less difficulty is experienced in disconnecting the operating-cord of an indicator from the cross-head while the engine is in motion, and hence this results in the continuous working of the indicator-drum even when no "card" is being taken. This continuous operation is a matter of great annoyance, especially when it is desired to substitute one card for another, resulting frequently in the unnecessary marking of a card.

The primary object of the invention is to provide for the operation of the indicator-drum only when a card is being taken, the drum at all other times being out of operation.

A further object is to cause the cross-head cord to control the operation of the indicator-drum by throwing such drum into operation as the engine reaches the back end of its stroke. In other words, the indicator-cord will itself control the starting of the indicator.

A further object is to provide simple and highly-efficient means for guiding the engine-cord, so that it will be evenly wound on and unwound from the wheel or drum without necessitating the raising and lowering of the latter.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in perspective, parts being broken away. Fig. 2 is a vertical sectional view. Fig. 3 is a horizontal sectional view on line 3 3, Fig. 2. Fig. 4 is a detail perspective view.

Referring to the drawings, A designates an indicator-drum (only a portion being shown) of any preferred form, and *a* the supporting-bracket therefor. It is understood, of course, that the paper on which a card is taken is placed on this drum. To this drum, and designed to be wound around the lower portion thereof, is connected a cord a', by the unwinding of which the drum is rotated as against the tension of its inclosed spring. (Not shown.)

B is a wheel or drum mounted on a smooth shaft *b*, depending from bracket *a*, to which it is held by a screw $b^{\times}$, engaging a threaded opening in its upper end. Extending through and engaging a threaded opening in the hub of this wheel is a hollow sleeve b', the lower portion b^2 of which is exteriorly threaded. The shaft *b* is inclosed by this sleeve, and its lower reduced threaded end b^3 projects below the lower end of said sleeve, and on said end b^3 is placed a nut b^4, which holds sleeve b' in position on the shaft *b*. To the periphery of wheel B is connected one end of the operating or engine cord b^5, the other end thereof being, as usual, connected to the cross-head of the engine.

C is the adjustable guide for the engine-cord. It comprises an upper arm *d*, capable of being gradually raised and lowered, and a lower stationary arm d', to the outer end of which the arm *d* is pivoted. The upper arm has an opening d^2, in which is mounted on swivels d^3 an interiorly-threaded collar d^4, designed to engage and be moved up and down on sleeve b' as the latter rotates with wheel B. The arm *d* is so bent or curved at d^5 that its outer vertical portion d^6 is concentric to and in line with the outer periphery of wheel B. To the upper end of this arm is pivotally secured a bracket d^7, carrying two guide-pulleys d^8, between which cord b^5 is passed. The inner end of arm *d* is pivoted to arm d', and the latter is bent or curved downward and thence into a horizontal portion d^9, which latter has a smooth hole d^{10}, through which the threaded end b^3 of shaft *b* projects. This end of the arm is held on the shaft by a second outer nut d^{12}. The result of this connection between the threaded hub of the wheel B and the guide C is that at each revolution of the wheel the guide-pulley is moved up or down a distance equal to the diameter of the cord. Thus the latter may be led in any direction and still wind smoothly on the wheel, coil to

coil. It will be observed that this cord-carrying device in no way interferes with the working of the other parts and cannot affect any of the latter outside of itself.

To a small spool *e* of wheel B is connected one end of a cord *e'*, the other end of which is attached to a spring-impelled box or drum E beneath bracket b^8. The shaft *f* of this box or drum is extended up through bracket *b'*, and loosely mounted thereon is a pulley F, to which is connected and around which is passed the cord *a'*. This pulley, being loose on its shaft, will not ordinarily revolve with the latter. A clutch H is designed to effect the rotation of said pulley with the shaft *f*.

With the hub of the pulley are formed ratchet-teeth *g*, with which is designed to engage the toothed face of a collar *g'*, rotatable with and movable longitudinally on shaft *f*, being guided in its longitudinal movements by a spline g^2. When this collar is in engagement with the ratchet-teeth *g*, the pulley F will rotate with the shaft *f* and box or drum E. A movable plate I is mounted on the upper side of bracket *a*, being held by a guide-screw *h* and formed with a slot *h'* to accommodate shaft *f*. The upper surface of this plate I is inclined or of wedge form, as at h^2, so that as it is moved longitudinally the clutch-collar *g'* is raised into engagement with the toothed hub of the pulley F. To the outer end of this sliding plate is pivotally connected an arm I, of right-angular form, its free end being forked, as at *i*, so as to straddle the operating-cord b^5. On this cord is a button *i*, so located that when the arm I is lowered and the engine is at the back end of its stroke the forked end of the arm will be engaged by said button, causing the plate I to throw the clutch into engagement, thus starting the movement of the indicator-drum, so that the card can be obtained.

It will be noted that the operation of the indicator-drum is controlled entirely by the operating-cord, so that when a card is not being taken the indicator-drum is not operated, the clutch member being disconnected by the wedge-plate being moved outward, and then the forked arm is elevated out of the way, as shown in dotted lines.

It will also be noted that the main operating-wheel B is mounted on a smooth shaft and that the even winding of the cord thereon, as well as the uniform unwinding, is accomplished by the raising and lowering of the cord-guide, the movement of which is effected by the rotation of said wheel. After the operating-cord is once connected to the crosshead of the engine parts of the mechanism may be continuously operated, but the indicator-drum will only be set in motion when a card is to be taken and after positioning of the paper on said drum. It is only necessary to lower the forked arm so that it will be engaged by the button on the engine-cord in order to set the drum in motion.

My improvements can be manufactured at a very slight expense, and by reason of the clutch connection between the drum-pulley and the operating mechanism wear on the drum is greatly reduced.

I claim as my invention—

1. The combination with a reducing mechanism for steam-engine indicators, of an indicator-drum designed to be operated thereby, a clutch connection intermediate of said drum and said mechanism, and means controlled by the operating medium for said mechanism for operating said clutch connection, substantially as set forth.

2. The combination with a reducing mechanism for steam-engine indicators, of an indicator-drum designed to be operated thereby, a clutch connection intermediate of said drum and said mechanism, and the engine-cord designed to operate said clutch connection, substantially as set forth.

3. The combination with a reducing mechanism for steam-engine indicators, of an indicator-drum designed to be operated thereby, a clutch connection intermediate of said drum and said mechanism, and a movable member for operating said clutch connection designed to be operated by the engine-cord, substantially as set forth.

4. The combination with a reducing mechanism for steam-engine indicators, and the operating-cord therefor having a button or projection thereon, of an indicator-drum designed to be operated by said mechanism, a clutch connection intermediate of said mechanism and said drum, and a movable member designed to operate said clutch connection when acted upon by said button or projection, substantially as set forth.

5. The combination with a reducing mechanism for steam-engine indicators, and the operating-cord therefor having a button or projection thereon, of an indicator-drum designed to be operated by said mechanism, a clutch connection intermediate of said mechanism and said drum, a movable plate or member designed to operate said clutch connection, and a movable arm connected thereto designed to be engaged by said button or projection when in line with the path thereof, substantially as set forth.

6. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and receiving the engine-cord, a vertically-movable guide for said cord and means operated by said wheel for raising and lowering said guide, a spring box or drum, and connections between the latter and said wheel, substantially as set forth.

7. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and provided with a central sleeve, the engine-cord being connected to said wheel, and a guide for said cord mounted on said sleeve, whereby the rotation of said wheel will raise or lower said guide, a spring box or drum, and connections between the latter and said wheel, substantially as set forth.

8. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and designed to have the engine-cord connected thereto, a depending exteriorly-threaded sleeve carried by said wheel, and a guide for said cord having a threaded portion engaging said sleeve and designed to be raised and lowered by the rotation of said wheel, substantially as set forth.

9. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and designed to have the engine-cord connected thereto, a depending exteriorly-threaded sleeve carried by said wheel, a guide for said cord, and a threaded collar carried by said guide and engaging said sleeve, substantially as set forth.

10. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and designed to have the engine-cord connected thereto, a depending exteriorly-threaded sleeve carried by said wheel, a guide for said cord having an opening, and an interiorly-threaded collar pivotally mounted in said opening and designed to engage said sleeve and move up and down thereon when said wheel is rotated, substantially as set forth.

11. In a reducing mechanism for steam-engine indicators, a wheel having a rotary movement and designed to have the engine-cord connected thereto, a depending exteriorly-threaded sleeve carried by said wheel, a guide for said cord comprising a lower stationary arm, an upper arm pivoted thereto at one end and carrying guide-pulleys for the said cord, and a collar on said upper arm engaging said sleeve, substantially as set forth.

12. The combination with the bracket, of the shaft depending therefrom having a lower threaded end, a wheel having a central, exteriorly-threaded sleeve inclosing said shaft, a lower arm held on the lower end of said shaft, an upper arm pivoted to said lower arm and having an opening, a collar pivotally mounted in said opening and having a threaded opening designed to engage the thread of said sleeve, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALPHEUS C. LIPPINCOTT.

Witnesses:
I. FERGUSON,
JAMES I. ROBERTSON, Jr.