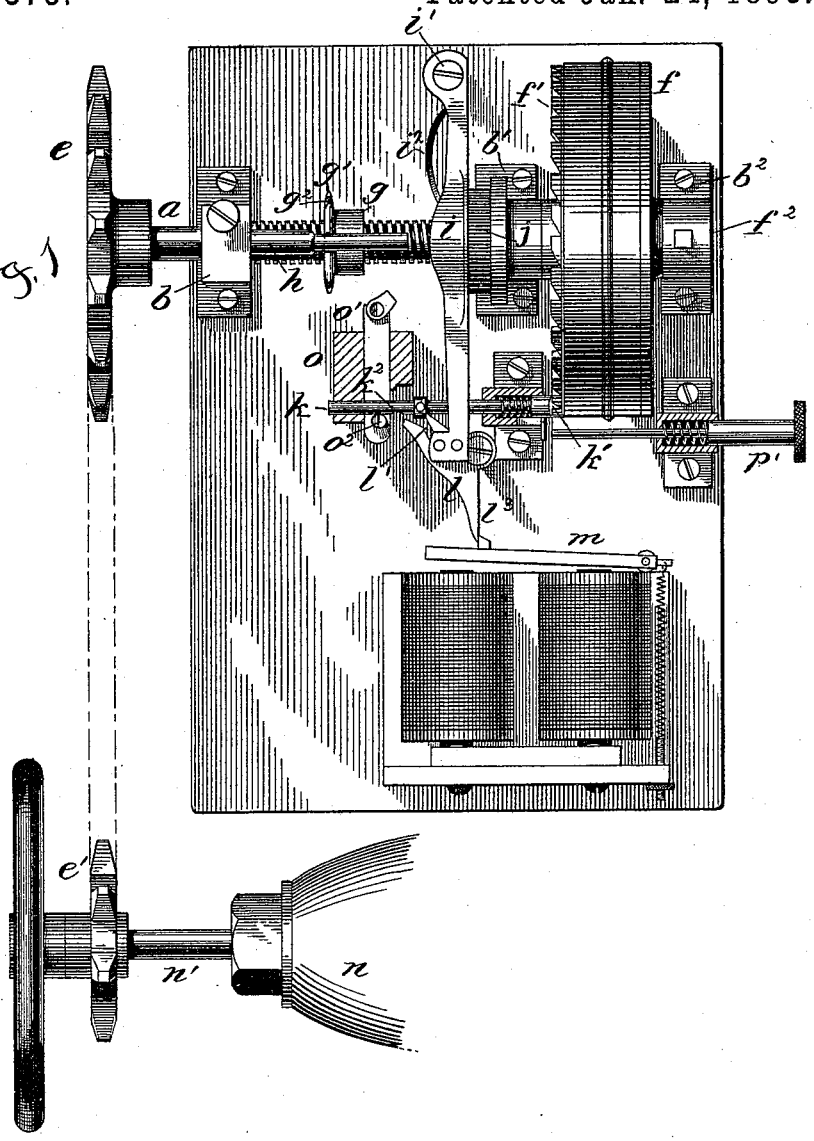
(No Model.) 2 Sheets—Sheet 1.

F. D. TAYLOR.

APPARATUS FOR STOPPING ENGINES.

No. 490,373. Patented Jan. 24, 1893.

Fig. 1



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2

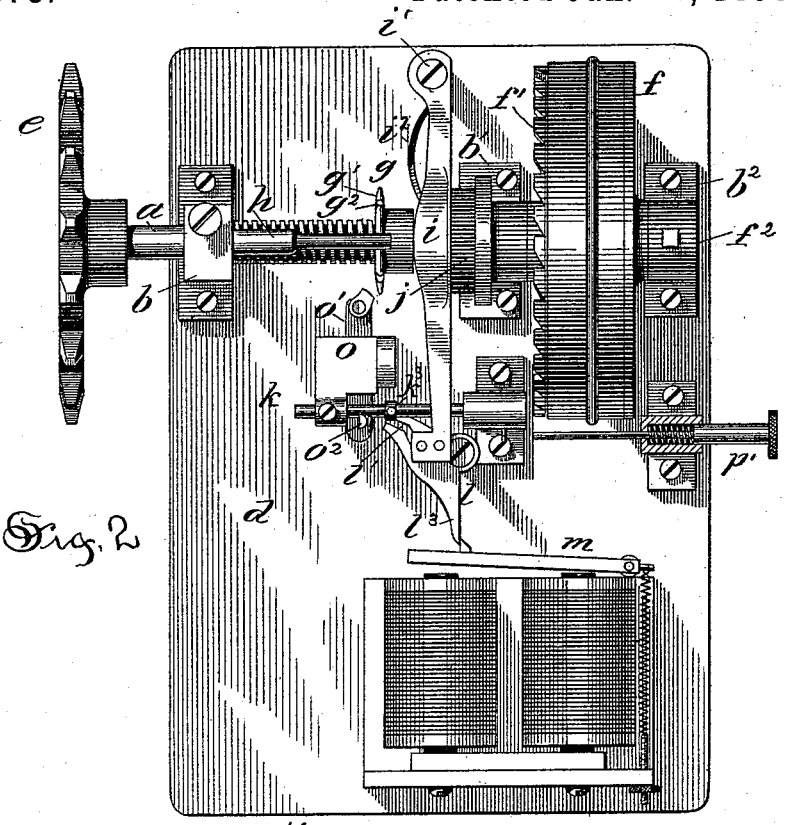
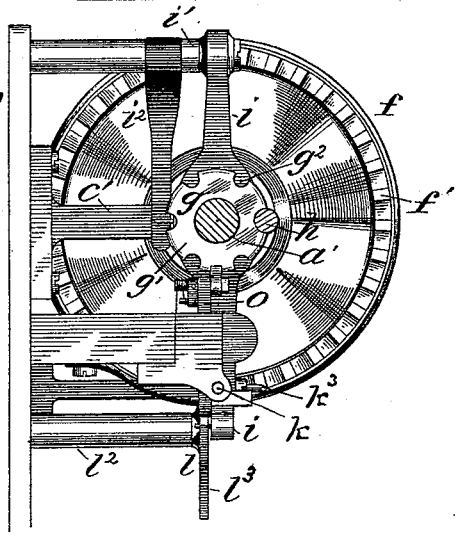


Fig. 3



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C. B. Jenkins.
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Inventor:
Frederick D. Taylor
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UNITED STATES PATENT OFFICE.

REISSUED

FREDERICK D. TAYLOR, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE ELECTRO-AUTOMATIC APPLIANCE COMPANY, OF SAME PLACE.

APPARATUS FOR STOPPING ENGINES.

SPECIFICATION forming part of Letters Patent No. 490,373, dated January 24, 1893.

Application filed April 26, 1892. Serial No. 430,724. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK D. TAYLOR, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Apparatus for Stopping Engines, of which the following is a full, clear, and exact description, whereby any one skilled in the art can make and use the same.

The object of my invention is to provide an apparatus by means of which a steam engine or other motor may be quickly stopped from any point at a considerable distance from that occupied by the apparatus; and a further object is to provide an apparatus that will automatically reset itself.

To this end my invention consists in the details of the several parts making up the apparatus as a whole and in their combination as more particularly hereinafter described and pointed out in the claims.

Referring to the drawings: Figure 1 is a detail plan view of the device with parts cut in sections to show construction and with the mechanism set in readiness to operate on the release of the clamping device. Fig. 2 is a detail plan view of the apparatus showing the position of the parts with spring barrel released from the clutch mechanism. Fig. 3 is a detail view in cross section through the device on plane denoted by line x—x of Fig. 1.

In the accompanying drawings the letter a denotes a shaft that is mounted in suitable bearings b b' that may be formed in standards c' that project from the base plate d. A sprocket wheel e is secured to this shaft, preferably on the outer end, and there is also secured to the shaft one member of a clutch device, in this instance a spring barrel f that is provided on one face with a ratchet f'. A coil spring is arranged within the barrel with one end secured to the latter and the other end to the axis f^2 on which the barrel is in part supported. This axis is secured to the bearing b^2 in any convenient manner. A portion a' of the shaft, preferably that which is located between the bearings b and b', is threaded and supports a nut g that has a sliding movement lengthwise of the shaft but is held against rotation thereon. This nut has a flange g' in which is cut a series of locking notches g^2 that engage a guide h that is secured to the frame or a part fixed thereto, and projects lengthwise of and substantially parallel to the shaft. The object of this arrangement of the guide h and the flanged nut is to enable the inner position of the nut to be determined. By inner position is meant its position with relation to the shipping lever i that is pivoted on a fulcrum i' at one side of the shaft and extends transversely across the shaft and preferably embracing it, as in the form illustrated in the drawings.

Between the back of the lever i and the standard c' there is preferably arranged an elastic buffer j, the nut being located upon the shaft on the side of the lever opposite the buffer. When the spring is unwound, that is, not under tension, by lifting the guide h out of its notch in the flange g' the nut may be turned until it compresses the lever against the elastic buffer to a greater or less degree. When the proper position is reached the guide is secured in place and holds the nut so that it will return each time to the same position on the threaded portion of the shaft by any given degree of rotation of the latter under the impulse of the spring. A spring pawl k forms the other member of the clutch mechanism in the form of apparatus shown and its beveled end k' operates in connection with the ratchet f' to hold the spring barrel in any desired position when the pawl and the ratchet are engaged. The shipping lever projects across the spring pawl to a point beyond it where it engages a guide slot l' in the tumbler l. This tumbler is pivoted to a fixed part of the frame, as to a post l^2, and has an arm l^3 adapted to engage a catch borne on the outer face of the armature of an electro magnet m.

The spring actuated shaft a is connected to the spindle n' of a throttle valve n by means of a chain passing over the sprocket wheel e on the shaft a and the sprocket wheel e' of the valve spindle n' when the apparatus is to be used in connection with a steam engine or the like in which a valve may be used to control the flow of the steam or other fluid actuating the motor. When the throttle valve so connected to the stop mechanism is opened

the shaft a is turned in such manner as to wind up the spring, the rotary movement of the shaft a causing the nut g to move along the shaft, the flange g' of the nut encountering the end of a trip device o and by sliding it outward throws the pin o^2 out of engagement with a locking notch k^2 on the spring pawl k and this releases the pawl so that its beveled end is thrown into engagement with the ratchet teeth.

The trip device comprises a slide o' bearing on its inner end next to the nut a spring retained block with a beveled end mounted on a shaft so as to swing freely in one direction but held against rotation in the opposite direction. This block yields to allow the nut to move freely toward the shipping lever, but extends into the path of movement of the nut in the opposite direction so that the nut operates in its movement to push the slide outward so as to throw the pin o^2 out of engagement with the locking notch k^2.

On the spindle of the spring pawl k a shoulder k^3 is formed in position to be encountered by the shipping lever when the latter is thrown outward by the spring i^2.

When the apparatus is set in position to operate to shut down the motor the parts are in the position as shown in Fig. 1 of the drawings and the apparatus is caused to operate as a shut-off or stop device by making or breaking an electric circuit as by pushing a button or moving a switch in a line of conductors that includes the electro-magnet m in the circuit. By causing the armature to be drawn toward the magnet (either by opening or closing the circuit as the case may be) the outer end of the tumbler is released so that it turns freely on the pivot, the shipping lever i is thrown over under the impulse of the spring encountering the shoulder k^3 withdrawing the pawl from its engagement with the ratchet, and this allows the spring to recoil, the spring pawl being locked in its outer position by means of the slide or trip device the pin o^2 on which engages the locking notch k^2 on the pawl. The recoil of the spring turns the spindle of the throttle valve in such manner as to shut off the flow of fluid used to drive the motor. By the rotation of the shaft a the nut is caused to move lengthwise toward and against the shipping lever which it pushes back against the buffer, the outer end of the shipping lever (by means of the pin engaging the guide slot l' in the tumbler) throwing the latter into engagement with the catch on the armature and thus resetting the releasing mechanism. The parts will then be in position as illustrated in Fig. 2 of the drawings. As soon as the throttle valve is opened, as by turning the valve spindle by means of the handle in the ordinary manner, the spring is again wound up, the slide forced back by the movement of the nut so as to release the spring pawl and cause it to engage the teeth in the ratchet and the device is reset so that when the tumbler is again released the apparatus will again operate to close the throttle valve without regard to the extent to which the latter may have been opened.

There is provided in this apparatus as shown means for releasing the spring barrel mechanically by simply pressing upon the exposed end of a push button or rod p that is mounted in a suitable support p' and with its inner end engaging the spring pawl in such manner as to cause the latter to be moved away from the ratchet when the push rod is thrust inward.

The form of clutch mechanism shown is the one preferred, but it is obvious that other forms for temporarily holding the shaft in position with the catch spring when wound up and under tension may be employed without exercising the faculties to an extent amounting to more than mere mechanical skill, and the use of such other forms of clutch devices within the combination come within the scope of my invention.

This stop apparatus is preferably inclosed in a suitable case or box and secured in a convenient position to enable the connection between the apparatus and the throttle valve to be conveniently made.

The elastic buffer is preferably made of india rubber, or like gum, and is secured to a fixed part of the frame, as the side of the standard c' (or it may be borne on the side of the shipping lever i) and its function is to receive and afford a rest for the shipping lever in its movements as it is pushed over by the nut which is caused to travel along the shaft by the rotation of the latter. It serves to break the shock of the recoil of the spring by acting as a brake to gradually stop the revolving of the shaft, and at a predetermined position.

I claim as my invention:—

1. In an apparatus for stopping a steam engine or other motor, in combination, a spring actuated shaft having a threaded portion, a clutch part secured to said shaft, an actuating spring having one end secured to the shaft and the other to a fixed part of the frame, a reciprocating nut borne on the threaded portion of the shaft and held against rotation thereon, a spring actuated shipping lever extending across the shaft and with its outer end engaging a tumbler, the tumbler with its outer end adapted to engage the armature of an electro magnet, the spring pawl having a shoulder located in the path of movement of the shipping lever, and the trip device with one end adapted to engage the spring pawl and the other located in the path of movement of the nut, all substantially as described.

2. In an apparatus for stopping an engine or other motor, in combination, a spring actuated shaft having a threaded portion, a clutch device having one part secured to said shaft and the other part mounted in operative relation thereto, the shipping lever extending across the shaft between an elastic buffer and a reciprocating nut, the recipro-

cating nut borne on the threaded portion of the shaft and held against rotation thereon, and an electro magnet having its armature adapted to engage the tumbler of the releasing and resetting mechanism, all substantially as described.

3. In an apparatus for stopping a steam engine or other motor, in combination, a spring actuated shaft having a threaded portion, a clutch part secured to said shaft, the actuating spring connected to the shaft and to a fixed portion of the frame, the sprocket wheel secured to the outer end of the shaft, a reciprocating nut borne on the threaded portion of the shaft and held against rotation thereon, a shipping lever extending across the shaft and having its outer end engaging a cam slot in a tumbler, a buffer located back of the shipping lever, the tumbler having a cam slot in engagement with a projection on the shipping lever, and an arm engaging a catch on the armature of an electro magnet, the armature having a catch device, the clutch part mounted in operative relation to the shipping lever, the trip device with means for holding the clutch parts disengaged, and the reciprocating nut having a flange adapted to operate the trip device in its reciprocating movement along the shaft, all substantially as described.

4. In an apparatus for stopping a steam engine or other motor, in combination, the spring actuated shaft having a threaded portion, the clutch part secured to one end of the shaft, a sprocket wheel secured to the outer end of the shaft, an actuating spring secured to the shaft and to a fixed part of the frame, and mechanism substantially as described for releasing the clutch and automatically resetting the releasing mechanism, all substantially as described.

5. In combination in an apparatus for stopping a steam engine or other motor, a spring actuated shaft having a theaded portion, the shaft actuating spring, the clutch parts secured to the shaft and to the frame respectively, and the releasing and resetting mechanism comprising a flanged nut borne on the threaded portion of the shaft and held against rotation thereon, all substantially as described.

6. In combination in an apparatus for stopping a steam engine or other motor, a spring actuated shaft having a threaded portion, the shaft actuating spring, the clutch parts secured to the shaft and to the frame respectively, the releasing and resetting mechanism comprising a flanged nut borne on the threaded portion of the shaft and held against rotation thereon, the flange of the nut having a series of locking notches, all substantially as described.

7. In combination in an apparatus for stopping a steam engine or other motor, a spring actuated shaft, the clutch parts secured to the shaft and to the frame respectively, the releasing and resetting mechanism comprising with the other elements a tumbler and a swinging shipping lever in operative engagement with each other, all substantially as described.

8. In combination in an apparatus for stopping a steam engine or like motor, a spring actuated shaft having a threaded portion, the clutch parts secured to the shaft and to the frame respectively, the releasing mechanism substantially as described, and the resetting mechanism comprising a reciprocating nut borne on the threaded portion of the shaft and held against rotation thereon, all substantially as described.

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