May 30, 1933. W. F. ARMSTRONG 1,911,936

CIGAR AND CIGARETTE LIGHTER

Filed Aug. 29, 1930 2 Sheets-Sheet 1

Fig. 1.

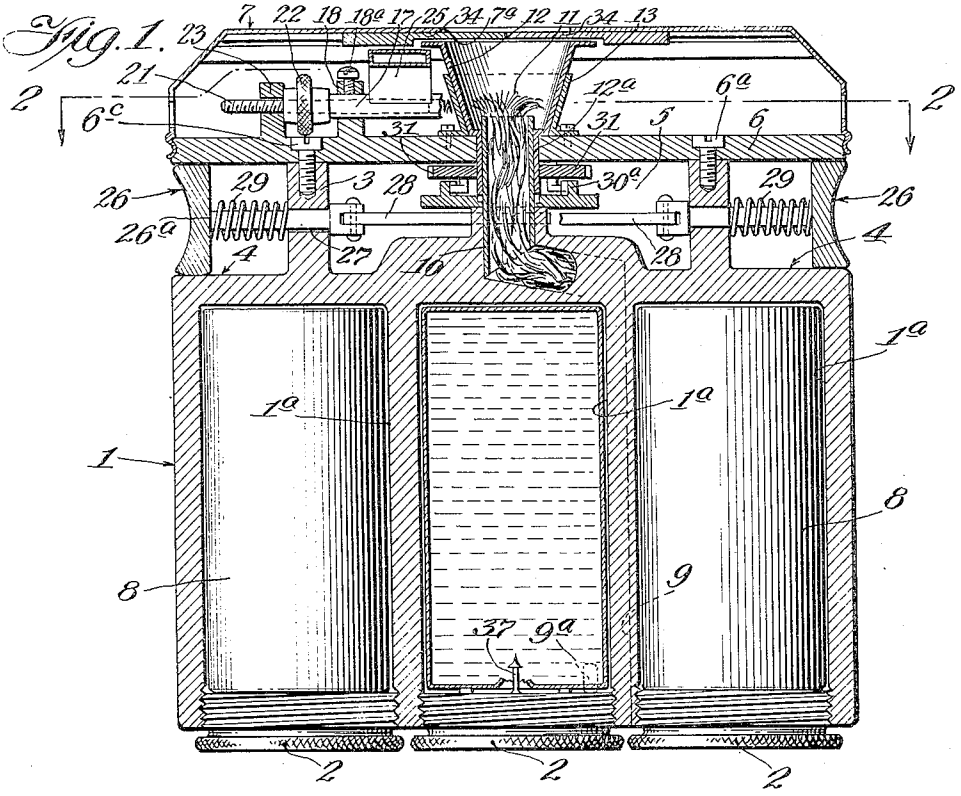


Fig. 2.

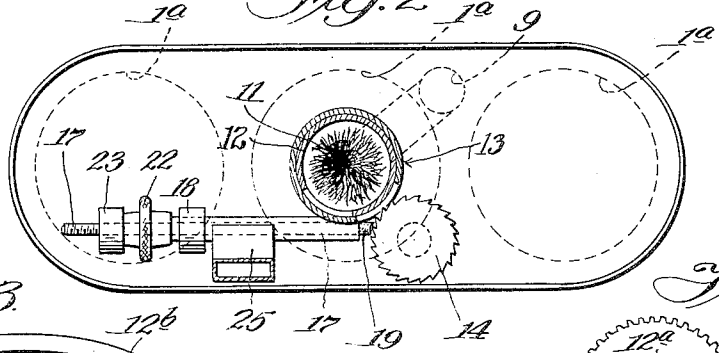


Fig. 3.

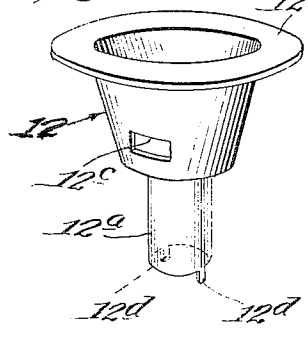


Fig. 4.

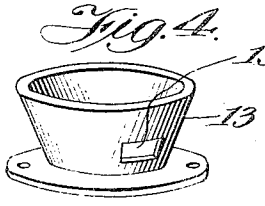
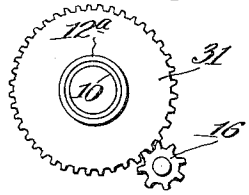


Fig. 5.



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Fig. 6.

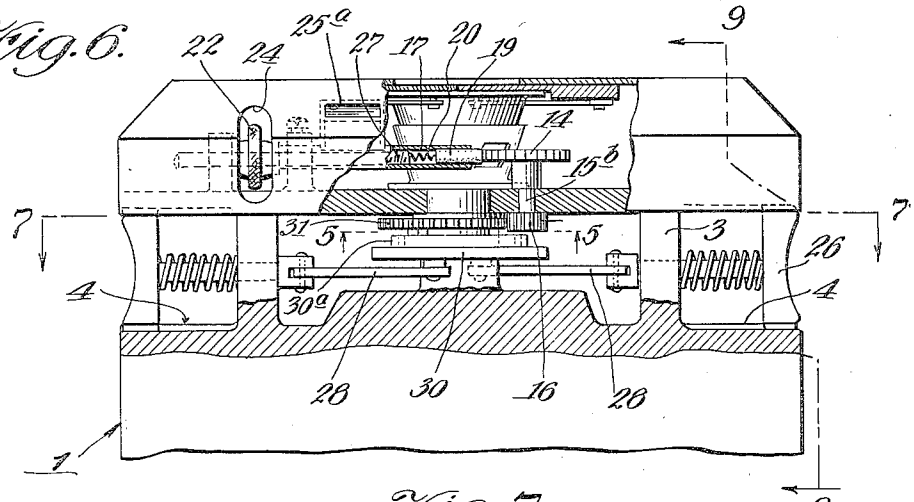


Fig. 7.

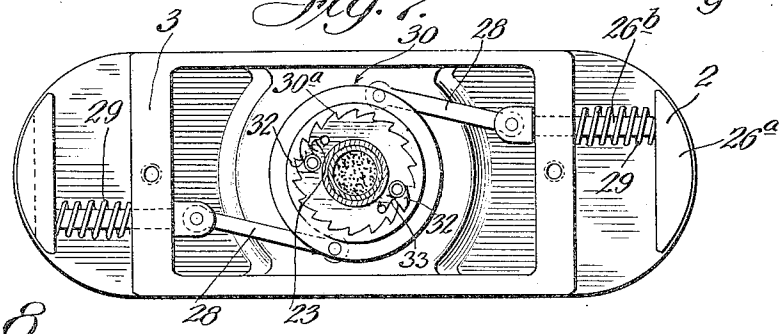


Fig. 8.

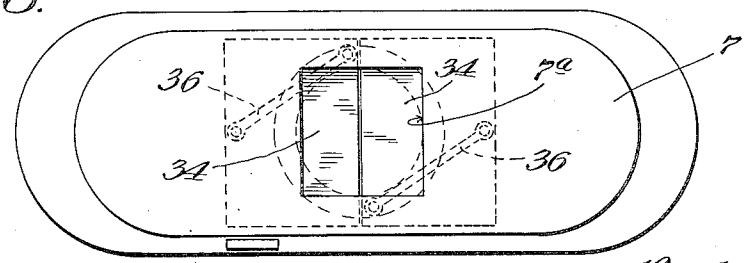


Fig. 9.

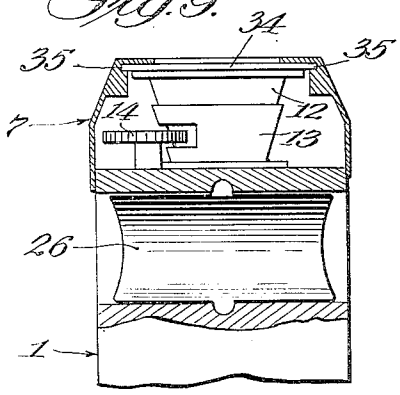
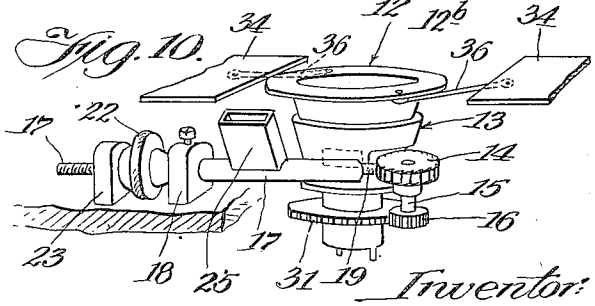


Fig. 10.



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UNITED STATES PATENT OFFICE

WALTER FREDERIC ARMSTRONG, OF CHICAGO, ILLINOIS

CIGAR AND CIGARETTE LIGHTER

Application filed August 29, 1930. Serial No. 478,751.

This invention relates to improvements in cigar and cigarette lighters, and more particularly to small pocket lighters including a casing for a supply of liquid fuel and igniting mechanism mounted on the casing and consisting of a manually actuated friction wheel, a pyrophoric element bearing against said wheel, the latter being positioned to project the sparks toward the end of a wick saturated with the fuel within the casing.

The object of the invention is to provide a practical and dependable lighter, utilizing such features of construction as will conceal the moving parts from view and protect them from accumulations of dirt and dust, and further to provide the lighter with an adequate fuel supply in the form of extra fuel cartridges carried within the casing.

The novel feature embodying the invention is disclosed in the accompanying drawings, in which

Figure 1 is a general view of the lighter in vertical section;

Figure 2 is a view in cross section as taken on line 2—2 of Figure 1;

Figure 3 is a perspective view of the movable element of the wick end housing;

Figure 4 is a perspective view of the base of the wick end housing;

Figure 5 is a detail view in cross section through the wick standard showing the gear for rotating the wick housing as taken on line 5—5 of Figure 6;

Figure 6 is a view of the upper portion of the lighter with portions broken away to show the details of the igniting mechanism;

Figure 7 is a cross sectional view taken on line 7—7 of Figure 6;

Figure 8 is a top plan view of the lighter;

Figure 9 is a detail view in vertical section taken on line 9—9 of Figure 6; and

Figure 10 is a perspective view of the igniting and shutter mechanism.

As shown in Figures 1 and 2, the lighter comprises generally a metal casing 1 of the conventional shape, being elongated in one direction and rounded at the sides for convenience in handling and for carrying in the pocket.

The major portion of the casing 1 is made up of walls which surround cylindric cavities or compartments 1^a extending lengthwise of the casing and opening at the bottom thereof. These compartments are shown as three in number, one being located at the center of the casing and one on either side thereof, said compartments being all of the same size and all being normally closed by means of screw caps 2 insertable within the tapped openings to the several compartments at the bottom of the casing. At the top end of the casing proper is an upstanding wall 3 forming a rectangular cavity, the end portions of the wall being spaced inwardly to form endwise opening recesses 4, 4 on opposite sides and near the upper end of the casing. The rectangular cavity 5 formed by the wall 3 encloses a part of the operating mechanism, and immediately over this cavity is a base plate 6 bearing upon the top edges of the wall 3 and fastened thereto by means of screws 6^a, 6^a. This plate extends the full width of the casing and encloses the recesses 4, 4 along their upper sides, although the main purpose of the base plate is to act as a support for the igniting mechanism.

Surmounting the base plate 6 is a removable cover 7 preferably made of thin metal stamped or shaped to converge at its ends and sides to a flat top wall having at its center a square opening 7^a.

Referring further to the cylindrical compartments in the casing 1, the same are adapted to contain cylindric cartridges 8 which are filled with a hydrocarbon fuel and then sealed, these cartridges being procurable as needed and inserted in the outermost pair of compartments which are intended to hold the reserve supply of fuel in the form of unbroken cartridges. The centermost compartment, however, holds the active supply of fuel and this compartment communicates near its lower end with a fuel passage 9 through a small lateral opening 9^a in the casing wall, said passage extending upwardly to a point above the compartment, and thence laterally to a point immediately above and in axial alignment with the compartment where it is continued upwardly through the cavity 5 and the base plate 6 through the

medium of a tube 10 fitted into the outlet end of the passage 9 and terminating just above said base plate 6. Inserted into the tubular extension 10 of the passage 9 is a wick 11 having its end projecting from the upper end of the tube and thence extending downwardly into the passage 9. Surrounding the space immediately around the end of the wick is a housing 12 with a wall diverging outwardly toward its upper end which is open and flanged about its edge. Extending downwardly from the base of the housing is a sleeve 12^a surrounding the tube 10 and extending downwardly through the base plate 6 well into the cavity 5. The housing 12 is supported for limited rotation about a vertical axis within a bearing member 13 of inverted frustro-conical shape fixed to the base plate 6 and forming a seat for the flared portion of the housing, the latter being provided at a predetermined point at its wall with a rectangular opening 12^c as shown in Figure 3. Moreover at the lower edge of its extended sleeve 12^a is a pair of downwardly projecting lugs 12^d, 12^d. In the tapered wall of the bearing member 13 is a slot 13^a adapted in one position of rotation of the wick housing 12 to register with the slot 12^c therein, thus providing a lateral opening to the space immediately around the wick end.

Supported upon the base plate 6 and beneath the cover 7 are the members of the igniting mechanism consisting of a friction wheel 14 mounted at the upper end of a short vertical shaft 15 extending downwardly through and having bearing in the base plate 6, said shaft having a small pinion 16 mounted at its lower end. The friction wheel is positioned immediately in front of the slot 13^a in the bearing member 13 with its toothed periphery just clearing the edges thereof. Extending along one edge of the base plate in the plane of the friction wheel is a tube 17 supported at one end in a bracket 18 integral with the base plate 6 and held stationary by means of a set screw 18^a. This tube is open at both ends and mounted in its inner end is a pyrophoric element 19 bearing against the periphery of the friction wheel 14 and backed by a small coil spring 20, which in turn bears against a small threaded screw shaft 21 extending into the tube from the outer end and having mounted thereon a thumb nut 22 located between the tube supporting bracket 18 and another bracket 23 through which the extended end of the screw shaft passes. Thus as the pyrophoric element 19 becomes worn in contact with the friction wheel, a slight rotation of the thumb wheel 22 feeds the pyrophoric element forwardly and into contact with the friction wheel. As shown in Figure 6, the cover 7 is provided with a slot 24 adjacent the thumb wheel 22, so that the latter may be rotated without removing the cover. Moreover, the tube 17 is provided with a chute 25 extending upwardly and laterally from a point near its inner ends and registering with an elongated slot 25^a in the cover 7, so that a new pyrophoric element may be inserted into the tube when required, having first retracted the screw shaft 21.

Referring now to the organization of parts for operating the igniting mechanism, the same comprises a pair of finger pieces 26, 26 located on opposite sides of the casing 1 just below the ends of the base plate 6 and moving inwardly and outwardly within the recesses 4 provided for them. These finger pieces consist of blocks 26^a extending vertically of the recesses 4 and having concave outer faces as clearly shown in Figures 1 and 9. Each block 26^a is mounted on a stem 26^b extending horizontally inward from a point near one end of the block and thence through openings 27 in the transverse end portions of the rectangular wall 3, the inner ends of these stems being connected with links 28, 28. Surrounding the stem 26^b of each finger piece between the blocks 26^a and the outer face of the walls 3, 3 is a coil spring 29 acting to force the block outwardly to its normally retracted position. As clearly shown in Figure 7, the stems 26^b, 26^b are offset on opposite sides of the major axis of the casing, as are also a pair of links 28, 28 forming continuations of the stems and having pivotal connection at their free ends at diametrically opposed points, on the periphery of a disk 30 mounted to rotate about the central wick tube 10 and connected with the tubular extension 12^a of the wick housing 12 through the medium of the lugs 12^d at the lower end thereof.

As shown in Figure 6, the links 28, 28 are connected to the under side of the disk 30, while on its upper face is an integral ring 30^a having ratchet teeth cut about its internal face. Thus it will be seen that by pressing the finger pieces 26 inwardly between the thumb and forefinger, the endwise movement transmitted to the links 28 rotates the disk 30 through an angle of approximately 90° in a counter-clockwise direction. Now this rotative movement is transmitted directly to the wick housing so that the same is likewise rotated, thus bringing the slot 12^c located in its flaring wall portion into register with the complementary slot 13^a in the bearing 13, thereby exposing the wick end to the friction wheel.

The pressure applied to the finger pieces simultaneously rotates the friction wheel through the medium of a large gear wheel 31 which is journalled on the sleeve 12^a of the wick end housing just below the base plate 6 and above the disk 30, said gear wheel meshing with the pinion 16 at the lower end of the stem 15 carrying the friction wheel 14. On the under side of the gear wheel 31 are

mounted a pair of pawls 32 adapted to engage the ratchet teeth on the disk 30, said pawls being pressed outwardly against the teeth by means of the usual arrangement of leaf springs 33, 33. Thus it will be further seen that as the finger pieces are pressed inwardly, rotation is imparted to the friction wheel 14 through the gear 31 and pinion 16, and when the finger pieces are retracted the gear wheel remains stationary, being temporarily disengaged by the pawl and ratchet connection. The ratio between the gear members 16 and 31 is such that the speed of rotation of the friction wheel is increased to a point such that the generation of sparks sufficient to ignite the wick is assured.

And finally as a part of the igniting mechanism, a pair of endwise shiftable shutter plates 34, 34 are provided between the opening 7^a and the top wall of the cover 7 and the flanged upper edge 12^b of the wick end housing 12, these shutters consisting of flat plates slidably supported at their side edges in guideways 35, 35 (Fig. 9) within the cover 7 and extending along the side edges of the top wall thereof. These shutter plates are connected with the wick end housing 12 by means of links 36, 36 pivotally connected at their outer ends to the under side of the plates adjacent their forward edges, and at their inner ends to the under side of the top flange 12^a of the wick end housing at points diametrically opposed to each other, as clearly shown in Figures 8 and 10.

Thus with the rotation of the wick end housing with each inward pressure upon the finger pieces, the shutter plates are shifted endwise in opposite directions to uncover the opening 7^a in the cover, and when the finger pieces are retracted under the action of the springs 29, 29, the shutter plates meet centrally of the opening 7^a in the cover 7, thereby completely closing said opening as well as snuffing out or extinguishing the burning wick.

Thus it will be seen that with each operation of the ignition mechanism initiated by pressing inwardly on the finger pieces 26, three operations are performed simultaneously: first, the rotation of the wick end housing 10 to bring the slots 12^c and 13^a into register and thus provide an opening for the admission of sparks from the friction wheel into contact with the wick end; secondly, the sharp rotation of the friction wheel against the pyrophoric element to generate the sparks, and thirdly, the shifting of the shutter plates away from each other, thereby uncovering the opening 7^a in the cover 7 so that the flame is exposed for lighting purposes.

As already described, the fuel for saturating the wick 11 is supplied from the cartridge placed in the centermost compartment 1^a, said cartridge having been inserted as a completely sealed container, the walls being preferably of a soft metal capable of being punctured by a pointed instrument such as a stem 37 mounted centrally of the closure cap 2 for the centermost compartment and projecting upwardly beyond the threaded portion thereof. Thus having inserted a sealed cartridge 8 into the center compartment, the act of screwing the cap to its seat forces the pointed stem 37 through the bottom wall of the cartridge, thus forming an outlet for the fuel into the bottom of the compartment, and thence to the entrance opening 9^a to the fuel passage 9.

With the additional cartridges carried in the outermost compartments, an ample reserve supply of fuel is carried in the lighter so that when a cartridge is exhausted another can be replaced, thus permitting the lighter to be used for long periods of time without replenishing the fuel supply other than inserting a fuel cartridge in the center compartment and similarly avoiding the possibility of the fuel becoming exhausted when no source of supply is at hand.

Having set forth the novel features of the embodiment of my invention, I claim:

1. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing, a rotative housing surrounding said wick end, a cover over said housing having an opening therein, a plate slidably mounted to open and close said opening and manually operative means for rotating said housing and shifting said plate.

2. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and mounted within a passage communicating with said fuel compartment, a rotative housing surrounding said wick end, a cover over said housing having an opening therein, a shutter plate operatively connected with said housing to open and close said opening and manually operative means for rotating said housing.

3. In a lighter for the purpose described, the combination of a fuel casing and a wick having an end projecting from said casing, ignition mechanism mounted on said casing adjacent said wick end, a rotative housing surrounding the wick end and having an opening in the wall thereof and in the plane of said friction wheel, and manually operative means for simultaneously rotating said housing and actuating said igniting mechanism.

4. In a lighter for the purpose described, the combination of a fuel casing, a wick having an end projecting from said casing, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end, a rotative housing surround-

ing the wick end and having an opening in the wall thereof, and manually operative means for simultaneously rotating said housing and said friction wheel, the rotation of said housing bringing the opening therein opposite said friction wheel.

5. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a housing surrounding said wick end and open at its top, a shutter mounted over the open end of said housing, and manually operative means for simultaneously rotating said friction wheel and for shifting said shutter into open and closed positions.

6. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a housing surrounding said wick end and open at its upper end, a cover for the end of said casing having an opening registering with the open end of said housing, a shutter slidably mounted between said cover and housing, and manually operative means for simultaneously rotating said friction wheel to generate sparks for igniting the wick and for shifting said shutter into open and closed positions.

7. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a housing surrounding said wick end and forming an upwardly opening chamber separated from said friction wheel by the wall of said housing, the latter having an opening therein adapted to be shifted into and out of register with the rotation of said housing through a predetermined angle, a shutter slidably mounted to open and close the open end of said housing, and a finger actuated member operatively connected with said friction wheel and said shutter for simultaneously actuating the same.

8. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a rotative housing surrounding said wick end and forming an upwardly opening chamber, a cover over said wick end housing having an opening registering with the open end thereof, a shutter slidably mounted to open and close said opening and operatively connected with said housing, and a finger piece operatively connected with said housing for rotating the same and shifting said shutter into and out of closed position.

9. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a rotative housing surrounding said wick end and forming an upwardly opening chamber separated from said friction wheel by the wall of said housing, the latter having an opening therein adapted to be shifted into and out of register with the rotation of said housing through a predetermined angle, a cover over said wick end housing having an opening registering with the upper end thereof, a shutter slidably mounted to open and close said opening and operatively connected with said housing, and a finger piece operatively connected with said housing and said friction wheel for simultaneously actuating the same and said shutter.

10. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing, a housing surrounding said wick end to provide a chamber open at its top and rotative bodily about its axis, a shutter slidably mounted to open and close the top of said housing and operatively connected thereto by a link, and manually operative means for rotating said housing through a predetermined angle.

11. In a lighter for the purpose described, the combination of a casing having a fuel compartment therein, a wick having its end projecting from said casing and adapted to be saturated by the fuel in said compartment, ignition mechanism mounted on said casing and including a friction wheel mounted adjacent said wick end and a pyrophoric element in contact therewith, a rotative housing surrounding the wick end and having an opening in the wall thereof normally offset

from said friction wheel, a disk journalled in said casing and connected with said housing, finger pieces including links connected with said disk, said friction wheel being operatively connected with said disk through an intermediate pawl and ratchet.

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