F. W. GOERDES.

IGNITER.

APPLICATION FILED NOV. 3, 1910.

**1,044,165.** Patented Nov. 12, 1912.

Fig. 1.

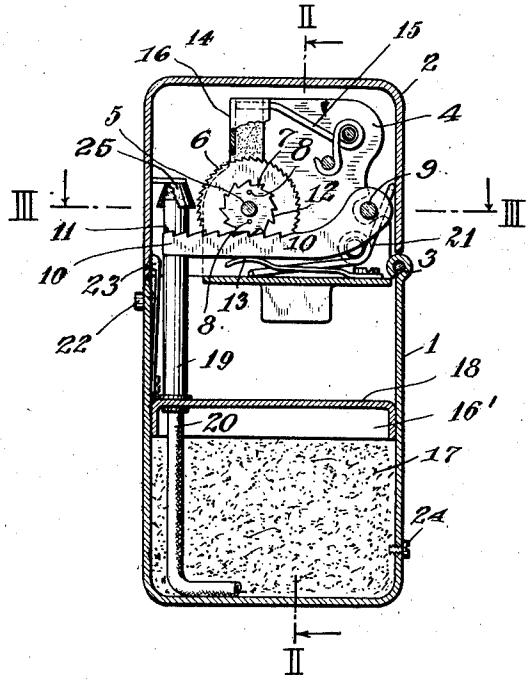



Fig. 2.

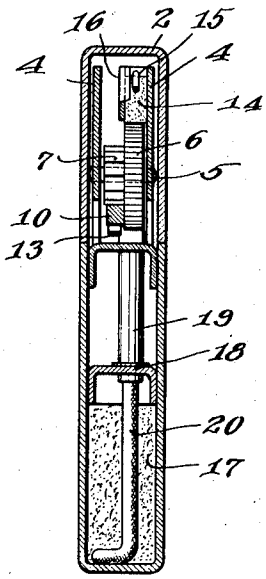



Fig. 3.

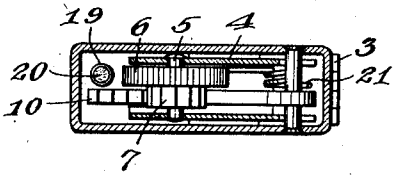
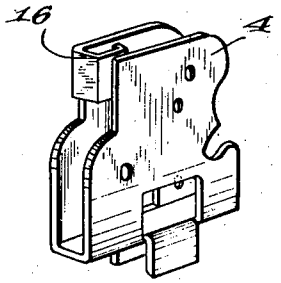



Fig. 4.




Frederick W. Goerdes.

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# UNITED STATES PATENT OFFICE.

FREDERICK W. GOERDES, OF NEWARK, NEW JERSEY, ASSIGNOR TO AMERICAN BUTTON COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## IGNITER.

1,044,165. Specification of Letters Patent. Patented Nov. 12, 1912.

Application filed November 3, 1910. Serial No. 590,418.

*To all whom it may concern:*

Be it known that I, FREDERICK W. GOERDES, a citizen of the United States, residing in the city of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Igniters, of which the following is a specification.

My invention relates broadly to the friction type of igniter, in which by rotation of a toothed member against a block of abrasive material, sparks are produced in such a manner as to ignite a suitable substance placed adjacent to the spark-producing means.

More specifically, my invention relates to certain improved means for automatically rotating the toothed or serrated disk when the cover of the containing case is opened.

My invention is adapted for embodiment in compact form, and is therefore especially adapted for use in connection with pocket lighters.

In the acompanying drawings which form a part of this specification, Figure 1 is a sectional view of my improved device, showing the operating parts in detail; Fig. 2 is a transverse sectional view on line II—II of Fig. 1; Fig. 3 is a sectional view on line III—II of Fig. 1; Fig. 4 is a perspective view of the structure in which the operating parts are adapted to be assembled.

Referring to the drawings in detail, the numeral 1 designates a case having the cover 2 hinged thereto by the hinge 3. Affixed to the case proper is the structure 4 which may be of a single stamping of sheet metal bent into shape. Mounted in this structure is the axle or pin 5, upon which are mounted the wheel 6, having a saw-toothed or serrated circumference, and the ratchet wheel 7. These wheels may be fastened together by means of the pins 8. Pivoted to the pin 9, affixed to the cover of the case, is the rack member 10, the teeth 11 of which engage the teeth 12 on the ratchet wheel 7. The spring 13 is provided for forcing the rack constantly to remain in engagement with the teeth of the ratchet wheel. Bearing radially downward upon the toothed or serrated cutting wheel 6 is a block 14 of abrasive material forced against the teeth of the wheel by means of the spring 15. The guide 16 is provided for maintaining the block of abrasive material in proper alinement with the cutting wheel. Formed in the lower part of the case is the compartment 16, in which may be placed a quantity of volatile and readily combustible fluid 17. Forming the upper wall of this compartment is the plate 18, through which extends the tubular member 19, guiding a wick 20, which preferably I form from some non-combustible fibrous material, such as asbestos. The upper end of this tube and the exposed end of the wick are placed in such a position as to receive the sparks formed by the rotation of the toothed cutting wheel against the abrasive material. The spring 21 is provided for forcing the cover to open when the button 22 is depressed, thus disengaging the catch 23 from its socket in the cover of the case. The withdrawal of the screw 24 presents an opening through which the supply of volatile liquid in the lower compartment of the case may be replenished.

I preferably provide a cap 25 affixed in any suitable manner to the cover, and adapted to inclose the protruding end of the wick when the cover is closed. This cap has the dual function of extinguishing the flame and of conserving the supply of volatile substance with which the wick is saturated by preventing evaporation. This cap I preferably make conical, so that it will seat snugly against the tube 19 when the cover is closed.

The operation of my device is at once simple and efficient. When the button 22 is depressed, permitting the spring 21 to force the cover into the raised position, the toothed cutting wheel is rotated through the coöperation of the rack pivoted to the cover and the ratchet wheel attached to the cutting wheel. This rotation of the cutting wheel cuts off fine chips from the abrasive material, the action being so rapid that the chips are heated to incandescence and sparks formed. These sparks impinge upon the wick saturated with a volatile fluid, producing the flame desired. When the cover is closed, there is no rotation of the toothed cutting wheel, since the teeth of the rack then ride over the teeth of the ratchet wheel instead of meshing with them, thus preventing undue wear of the toothed wheel through unnecessary friction with the abrasive block. I preferably form this block of the substance commonly known in the trade as cerium, although other hard or flinty substances may

be used. I find there is distinct advantage in forming cutting teeth instead of mere ridges upon the periphery of the cutting wheel, in order that particles of the abrasive substance may be cut cleanly from it, thus increasing the efficiency of the spark and decreasing the wear upon the rotating member.

While I have illustrated and described only one specific embodiment of my invention, I realize that it is susceptible of broader application and I do not desire to be limited to the structure illustrated and described.

Having thus described my invention, I claim:

1. In a pyrophoric pocket lighting appliance, the combination of a casing, a cover for the casing, a benzin container within the casing and provided with a wick, a friction wheel rotatably mounted on the container, a ratchet wheel connected to the friction wheel, means for holding a pyrophoric substance in engagement with the friction wheel, and a rack bar actuated by said cover to rotate the ratchet wheel only when the cover is opening to throw sparks on the wick.

2. In an igniter, in combination, a case, a cover therefor, a block of abrasive material, rotary spark-producing means in contact therewith, and a rack having ratchet teeth thereon operated by movement of the cover for rotating said means.

3. In an igniter, in combination, a case, a cover therefor, a block of abrasive material, rotary spark-producing means in contact therewith, and a straight rack pivoted to the cover for rotating said means.

4. In an igniter, in combination, a case, a cover therefor, a block of abrasive material, rotary spark-producing means in contact therewith, a member having a ratchet tooth thereon and operated by movement of the cover, and yielding means for forcing said toothed member into engagement with said rotary member.

5. In an igniter, in combination, a toothed rotary cutting member, a block of abrasive material in contact therewith, and means for actuating said toothed rotary cutting member, including a rack having ratchet teeth thereon and a ratchet wheel adapted to be rotated thereby.

6. In an igniter, in combination, a case, a cover therefor, a toothed rotary cutting member mounted in said case, a block of abrasive material in contact with said cutting member, and means including a rack having ratchet teeth thereon and a ratchet wheel for actuating said rotary member when the cover of the case is opened.

7. In an igniter, in combination, a case, a cover therefor, a toothed rotary cutting member mounted in said case, a block of abrasive material in contact with said rotary member, a ratchet wheel attached to said rotary cutting member, and a ratchet rack pivoted to the cover and engaging said ratchet wheel, said wheel and rack operating to rotate the cutting member when the cover is being opened and not to rotate said member when it is being closed.

8. In an igniter, in combination, a case, a cover therefor, means for locking and releasing said cover, a spring for opening the cover when released, a rotary cutting member, a block of abrasive material in contact therewith, and means operating to revolve said rotary member when the cover is released, said means including a ratchet wheel, a ratchet rack pivoted to the cover, and means for forcing the rack into engagement with the ratchet wheel.

9. In an igniter, in combination, a case, a cover therefor, means for locking and releasing said cover, a spring for opening the cover when released, a rotary cutting member, a block of abrasive material in contact therewith, and means operating to revolve said rotary member when the cover is released, said means including a ratchet wheel, a rack pivoted to the cover, and a spring for forcing the rack into engagement with the ratchet wheel.

10. In an igniter, in combination, a case, a cover therefor, means for locking and releasing said cover, a rotary cutting member, a block of abrasive material, means for maintaining the same in contact with the said rotary member, a ratchet wheel mounted on the same shaft with and affixed to the said rotary member, a straight rack pivoted to said cover, whereby the said rotary member and ratchet wheel are rotated when the cover is released, and are maintained stationary when the cover is being closed.

FREDERICK W. GOERDES.

Witnesses:
K. S. CARTER,
ELSIE SCHENCK.

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Correction in Letters Patent No. 1,044,165.

It is hereby certified that in Letters Patent No. 1,044,165, granted November 12, 1912, upon the application of Frederick W. Goerdes, of Newark, New Jersey, for an improvement in "Igniters," an error appears in the printed specification requiring correction as follows: Page 1, line 30, numerals indicating section line, for "III–II" read *III–III;* and that the said Letters Patent should be read with this correction therein, that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 12th day of August, A. D., 1913.

[SEAL.]

E. B. MOORE,

*Commissioner of Patents.*