Jan. 5, 1926. 1,568,527

C. H. PEARSON

SAFETY CLUTCH MECHANISM

Filed Jan. 14, 1925

Fig. 1.

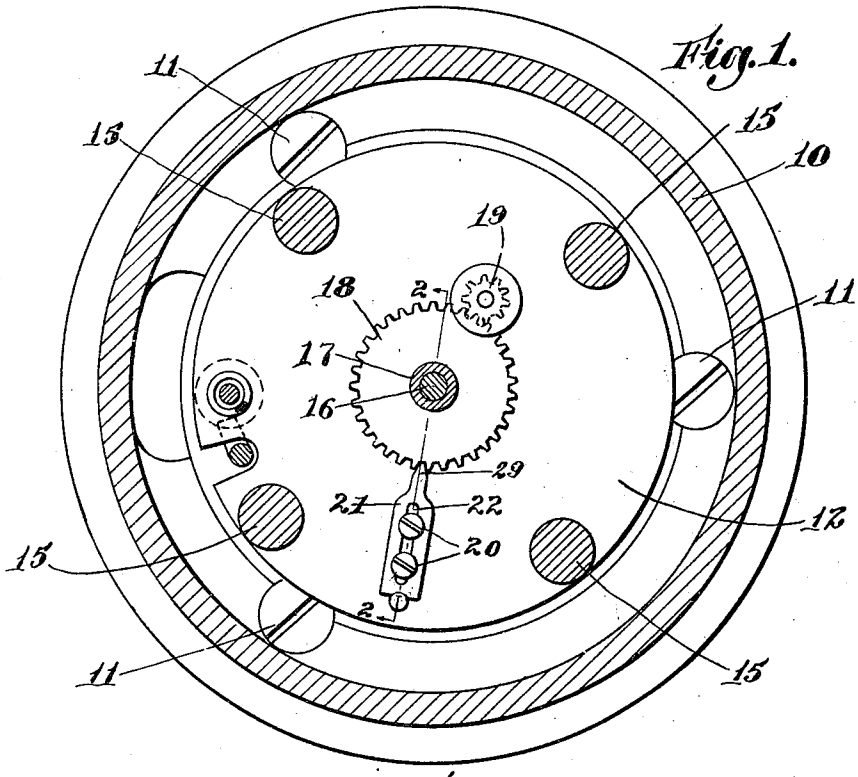
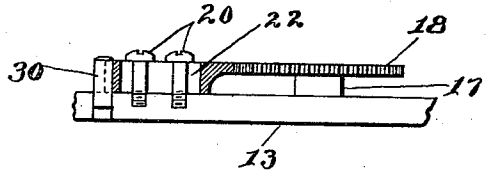


Fig. 2.



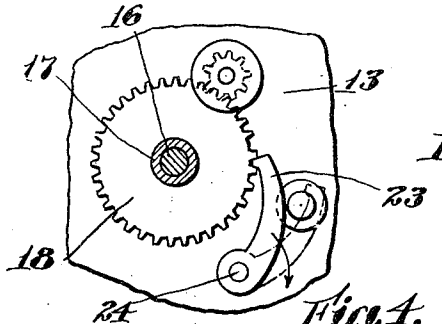
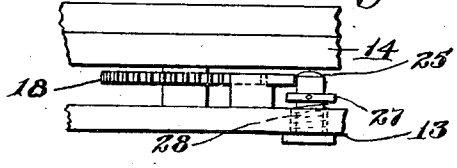


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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SAFETY-CLUTCH MECHANISM.

Application filed January 14, 1925. Serial No. 2,425.

To all whom it may concern:

Be it known that I, CHARLES H. PEARSON, a citizen of the United States, and a resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Safety-Clutch Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings representing like parts.

My present invention relates to mechanical time fuses, and more particularly to a releasing means for permitting the starting in operation of the timing train on the shock of firing only.

In mechanical time fuses as at present constructed, a serious defect is the absence of efficient means for preventing premature discharge of the fuse by the progressive movement of one or more parts under the influence of a plurality of blows or jars less than the blow or jar imparted thereto by the shock of firing.

My present invention obviates in a simple and efficient manner the above defects of prior structures, and in carrying out my invention I associate with the gear carried by the rotating sleeve of the timing train, or with the dummy gear or similar contrivance carried by the sleeve, a locking pawl which is held in engaging position by means of a plunger that is operated by the shock of firing. The force exerted on the locking pawl by the driving spring for the timing train is considerably greater than the force exerted by the locking pawl on the retaining plunger. Further, the spring or other means associated with the movable plunger, while not as strong as the driving spring for the timing mechanism, is amply strong to overcome the force exerted on the plunger by the locking pawl. It is obvious, therefore, that when a slight movement is imparted to, as it will be, the plunger by a blow or jar less than the blow or jar imparted thereto by the shock of firing, the spring associated with said plunger will be able to restore the plunger to normal locking position. It is, therefore, impossible with my construction for the plunger to be progressively moved step by step by a series of jars or blows to thereby allow premature discharge of the fuse.

The object of my invention, therefore, is an improved construction whereby accidental discharge of a timing fuse due to progressive derangement of the locking mechanism for the timing train is prevented.

In the accompanying drawings illustrating the preferred embodiment of my invention as applied to a timing fuse,

Fig. 1 is a sectional plan view of a fuse with the timing train attached;

Fig. 2 is a fragmentary sectional elevation on the line 2—2 of Fig. 1;

Fig. 3 is a detail plan view of the central portion of Fig. 1 showing in dotted position the locking pawl after the fuse has been subjected to the shock of firing, and

Fig. 4 is an elevation of Fig. 3.

Referring to the drawings, 10 designates a fuse base on which is secured by screws 11 the timing train 12. This timing train includes, among other elements, a middle plate 13 and a top plate 14, the bottom plate being omitted for the sake of clearness of illustration, and in Fig. 1 the top plate 14 has been removed. The plates are held in operative relation to each other by posts 15, this being the usual construction.

Rotatably mounted in the middle and top plates 13 and 14 respectively is a center staff 16 and surrounding said staff and normally rotatable thereon is a sleeve 17 which has secured thereto near its bottom portion a gear 18 which meshes with a pinion 19 to drive the timing train, it being understood, of course, that the driving spring is connected to, and rotates, the sleeve 17 and associated gear 18. Under normal conditions the staff 16 and sleeve 17 are rotatably mounted with respect to each other and under the shock of firing are wedged together to operate as a unit, under these conditions the sleeve 17 driving the center staff 16. Also associated with the staff 16 is a setting disc and by means of which the setting of the fuse is controlled. As, however, this is the usual construction, and as this construction concerns no part of my present invention, it has not been illustrated and will not be described in detail.

Mounted on the middle plate 13, by screws 20, is a block 21. This block is provided with a slot 22, and the block is adapted to slide longitudinally on the screws 20. One end of the block 21 is provided with a tooth 29 adapted to engage with the teeth of the gear 18. When in locking position, the block 21 is prevented from moving longitudinally so as to move the tooth 29 from the teeth of the gear 18 by pin 30. This pin

is a tight fit in a hole formed in the middle plate 13. Ordinary blows or jars imparted to the device are insufficient to cause longitudinal movement of the pin 30 in the hole but the jar consequent on the shock of firing is sufficient to cause the pin to move into its hole clear of the block 21. The centrifugal force of the shell causes the block to move longitudinally and withdraws the tooth 29 from the teeth of the gear 18. While I have described a gear 18 as the element engaged by the locking block 21, it is obvious that my invention is not to be so limited and I may utilize a gear similar to the gear 18, but distinct therefrom as a locking means. Further, my invention is not restricted to the use of a gear, either the gear 18 or a similar one, and I may employ a radially extending arm, or any other desirable element, as a lock-means.

Referring now to Figs. 3 and 4, there is shown a plunger 25 which is fitted into a recess in the middle plate 13. The upper end of the plunger 25 engages with the pawl 23 to hold said pawl in engagement with one of the teeth of the gear 18 or its equivalent. Adjacent to the top end of the plunger 25 is secured a ring 27 and below the ring 27 and the bottom of the recess in the plate 13 is a coil spring 28 which tends to force the plunger 25 upward. Any blow or jar imparted to the fuse less than the shock of firing will compress the spring 28 slightly, and as the force exerted on the pawl 23 by the driving spring that is on the sleeve 17 is less than the force exerted on the plunger 25 by the spring 28, the resiliency of the spring 28 is ample to return the plunger 25 to its normal position, as indicated in Fig. 4, and thus return or retain the free end of the pawl 23 in engagement with the teeth of gear 18 or its equivalent. On the shock of firing, the spring 28 is compressed sufficiently to allow the pawl 23 to rotate in the direction of the arrow shown in Fig. 3 so that such pawl will occupy the position indicated in dotted lines in said Fig. 3 and the spring 28 will thereafter move the plunger 25 upward so as to retain the pawl 23 in its rotated position.

By my present invention I am enabled to utilize a simple and efficient means for retaining the driving mechanism of the timing train in its inoperative position until positively released by the shock of firing, and on any shock less than the shock of firing, to return or hold the timing train positively against operation.

While I have necessarily shown and described the preferred embodiment of my invention somewhat in detail, it is to be understood that I may vary the size, shape, and arrangement of parts within wide limits without departing from the spirit of the invention.

Having thus described my invention, what I claim as new is:

1. In a fuse, the combination of a rotatably mounted member, a gear secured thereto, a pivotally mounted pawl associated therewith and normally preventing rotation thereof, a longitudinally movable plunger associated with the pawl and normally preventing rotation thereof, and means associated with the plunger for permitting rotation of the pawl on the shock of firing only.

2. In a fuse, the combination of a rotatably mounted member, a gear associated therewith, a pivotally mounted pawl engaging said gear and normally holding the rotatable member from rotation, means associated with said pawl for holding the pawl in operative relation to the gear, and means for returning said latter means to normal position when the fuse is subjected to slight blows or jars.

In testimony whereof, I have signed my name to this specification.

CHARLES H. PEARSON.