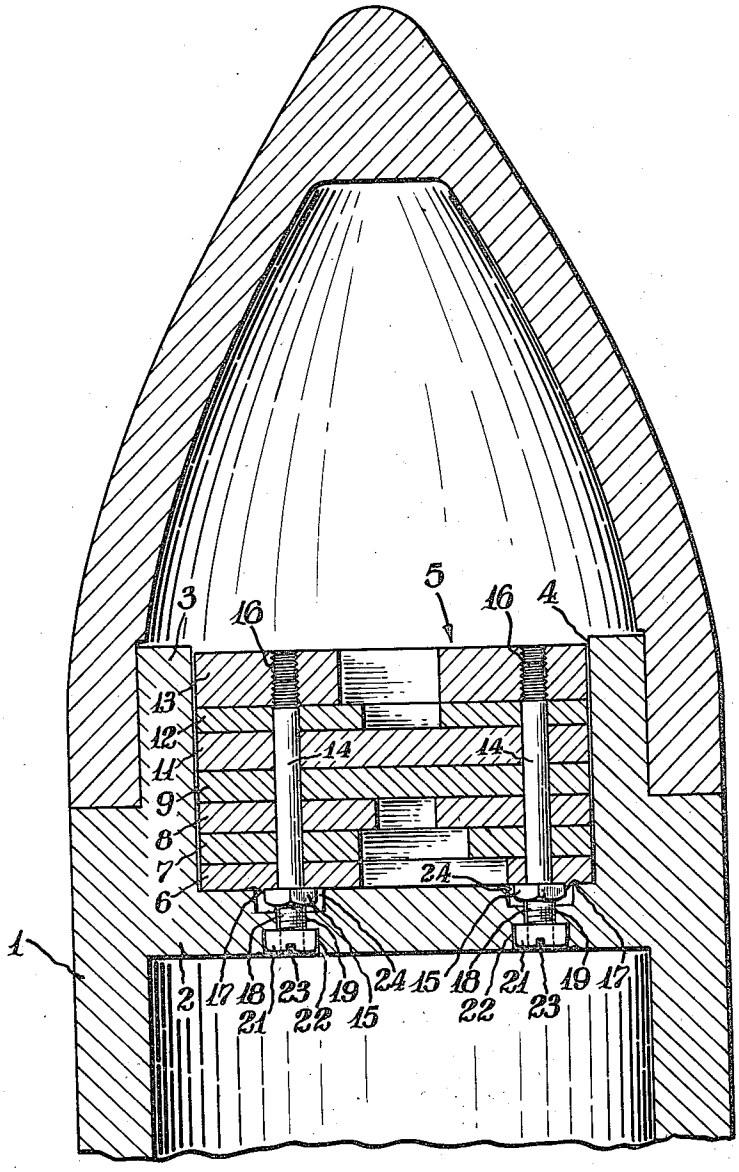
March 25, 1941. Y. SEKELLA 2,236,037

MECHANICAL TIME FUSE

Filed Nov. 23, 1938



INVENTOR.

Witness:
Burr W. Jones

BY Youston Sekella
Clinton L. James
ATTORNEY.

Patented Mar. 25, 1941 2,236,037

UNITED STATES PATENT OFFICE

2,236,037

MECHANICAL TIME FUSE

Youston Sekella, Elmira Heights, N. Y., assignor to Bendix Aviation Corporation, South Bend, Ind., a corporation of Delaware

Application November 23, 1938, Serial No. 242,051

3 Claims. (Cl. 102—36)

The present invention relates to a mechanical time fuse for explosive projectiles and more particularly to the mounting and anchoring of the timing movement thereof.

In certain types of mechanical fuses as now constructed, it is customary to control the release of a firing pin by means of a timing mechanism including clock mechanism which is automatically put in operation when the projectile is discharged from a suitable rifled gun barrel. The clock mechanism must of necessity be precise in its action in order to obtain the desired accuracy of timing, while its construction and mounting must be strong and rigid in order to withstand the heavy accelerational forces incident to the discharge of the projectile without impairing the accuracy of control of the subsequent detonation thereof.

One known method of construction is to build up the frame of the clock mechanism from a plurality of discs providing bearings for the various gears, etc., the assembled discs being clamped together by means of a plurality of screws traversing the end discs and tapped into an intermediate disc. The movement so assembled is tested for proper functioning and accuracy, and is thereupon mounted in a suitably formed seat in the body of the projectile, being retained in the seat by means of bolts projecting up from the seat and tapped into one or more of the intermediate discs of the frame.

It has been found in fuses so constructed and mounted that it is possible for the clamping action of the mounting bolts to set up strains in the frame which disturb the adjustment of the clock mechanism and impair the accuracy thereof.

It is an object of the present invention to provide a novel mechanical time fuse for explosive projectiles which is accurate, reliable, easy to assemble and stable in adjustment.

It is another object to provide such a device incorporating provisions whereby the adjustment of the timing mechanism is not disturbed by the installation and anchorage thereof in the projectile.

It is a further object to provide such a device which is simpler and stronger than structures heretofore used and which requires the exercise of less care in the assembly thereof.

Further objects and advantages will be apparent from the following description taken in connection with the accompanying drawing which is a vertical substantially midsectional view of a portion of a shell casing incorporating a preferred embodiment of the invention.

In the drawing there is illustrated a portion of a shell casing 1 having a partition 2 formed near the end thereof and an annular flange 3 defining a cup-shaped seat 4. A timing mechanism of any suitable or preferred type indicated generally by numeral 5 is arranged to be mounted in the seat 4. As here illustrated, the timing mechanism 5 is formed by a plurality of circular plates 6, 7, 8, 9, 11, 12 and 13 superimposed on each other and rigidly held in assembled relation by means of bolts 14 traversing said plates. It will be understood that these plates constitute frame members housing the various gearing elements of the timing mechanism, but since these latter form no part of the present invention, it has been deemed unnecessary to illustrate the same.

According to the present invention, bolts 14 are provided with heads 15 adjacent their lower ends and are tapped into the upper end plates 13 as indicated at 16 whereby the timing mechanism is maintained as a unit assembly which can be adjusted and tested before being mounted in the shell. In order to maintain the clamping action of the bolts 14 uniform without the possibility of loosening after the assembly thereof, the heads 15 are locked in tightened position by suitable means such as by upsetting the metal of the disc 6 against the sides of said heads as indicated at 17.

The bolts 14 are provided with threaded extensions 18 beyond the heads 15, which extensions are arranged to traverse openings 19 in the partition 2 of the shell and receive clamping nuts 21 seated in recesses 22 in said partition. The nuts 21 are preferably provided with slots 23 for the reception of a spanner or other suitable tool for tightening purposes. The upper side of partition 2 is provided with recesses 24 to receive the heads 15 of the bolts, so as to permit the bottom plate 6 of the timing mechanism to rest directly on the partition.

In the assembly of the fuse, the bolts 14 are set up tightly by means of a suitable wrench whereby the plates of the timing mechanism are tightly clamped together. The timing mechanism is then adjusted and tested and thereafter inserted in the shell body 1 with the extensions 18 of the bolts 14 received in the openings 19 in the partition 2.

The nuts 21 are then tightened down on the extensions 18 of bolts 14, but since it is impractical to tighten these nuts by a spanner with as

much pressure as has been applied in assembling the timing mechanism, it is clear that no substantial additional pressure will be brought to bear on the components of the timing mechanism when the latter is assembled in the shell. In other words, the pressure applied by tightening up the nuts 21 relieves the pressure of the heads 15 on the bottom plate 6 of the timing mechanism so that the total pressure of the components of the timing mechanism remains substantially constant and the adjustment of the timing mechanism is not distrubed by its assembly in the shell.

It will be understood that the timing mechanism when so assembled operates in the usual manner except that the adjustment of the parts prior to mounting in the shell is not disturbed by such mountnig, and the reliability of operation thereof is accordingly enhanced.

Although but one form of the invention has been shown and described in detail, it will be understood that other forms are possible and that various changes may be made in the precise arrangements of the parts without departing from the spirit of the invention as defined in the claims appended hereto.

What is claimed is:

1. In an explosive projectile, a shell body having a partition forming a seat, timing mechanism including a laminated frame adapted to rest on said seat, headed screws traversing the laminations of the frame and clamping them together, the heads of the screws having threaded extensions, said partition having openings adapted to receive the heads and thereby permit the frame of the timing mechanism to bear directly on the seat with said extensions protruding through the partition, and nuts on the protruding ends of the extensions clamping the timing mechanism on the seat.

2. In an explosive projectile, a shell having a cup-shaped receptacle with a flat bottom forming a seat, a timing mechanism having a frame comprising a plurality of flat discs, a plurality of headed screws traversing the discs and clamping them together to form a unitary frame, said frame being mounted in the receptacle, the bottom of the receptacle having openings adapted to receive the heads of the screws, thus permitting the frame to rest on the seat, said screws having extensions protruding through the bottom of the receptacle, and nuts on said extensions for clamping the frame to the seat.

3. In an explosive projectile, a shell body having a partition forming a seat, timing mechanism including a laminated frame adapted to rest on said seat, means for securing the laminations together as a unit prior to assembly thereof on said seat, said means including threaded members traversing the laminations and having parts secured thereto bearing against the lowermost lamination, said members having threaded extensions, said partition having openings adapted to receive said parts and said extensions thereby allowing said lowermost lamination to bear directly upon said seat with the extensions protruding through the partition when said unit is assembled on said seat, and means cooperating with said threaded extensions for clamping the timing mechanism on the seat.

YOUSTON SEKELLA.