F. T. BAIRD.

ELECTRIC LANTERN.

APPLICATION FILED DEC. 4, 1916.

1,275,360.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

Fig. 1

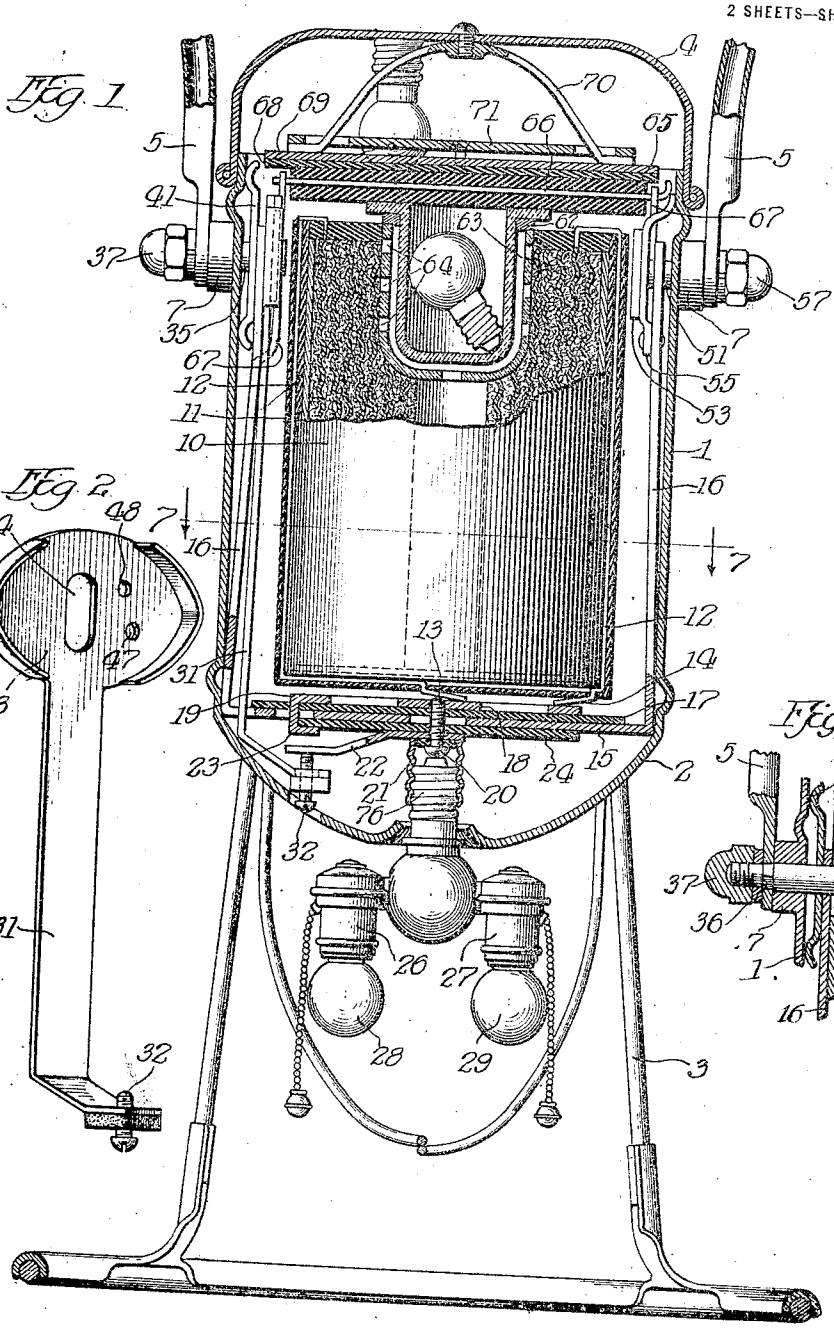


Fig. 2

Fig. 15.

Inventor

Frank T. Baird,

By Cheever & Cox

Attys.

F. T. BAIRD.

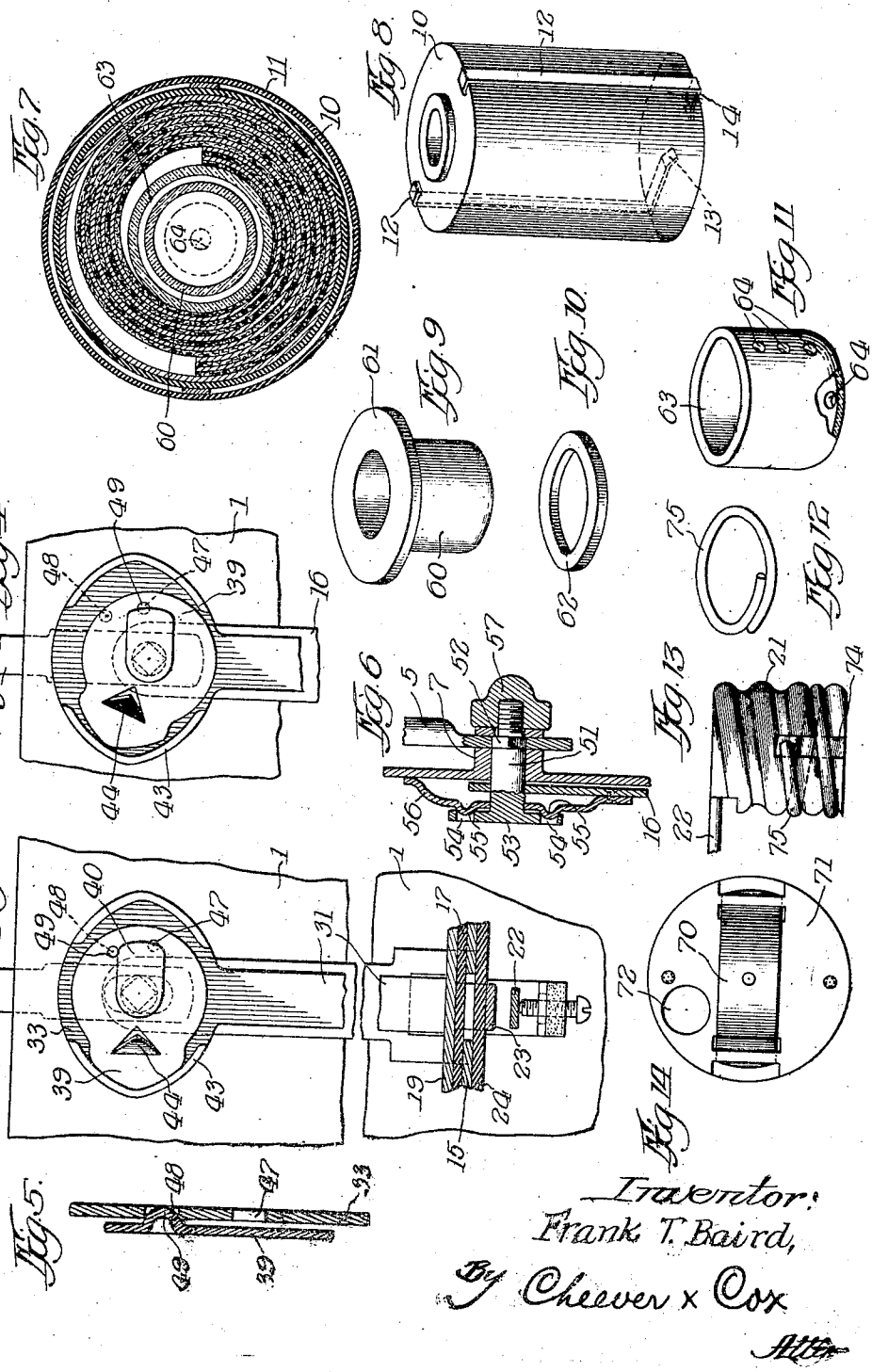
ELECTRIC LANTERN.

APPLICATION FILED DEC. 4, 1916.

1,275,360.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 2.



Inventor:
Frank T. Baird,
By Cheever & Cox
Attys.

UNITED STATES PATENT OFFICE.

FRANK T. BAIRD, OF BLUE ISLAND, ILLINOIS.

ELECTRIC LANTERN.

1,275,360. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed December 4, 1916. Serial No. 134,871.

To all whom it may concern:

Be it known that I, FRANK T. BAIRD, a citizen of the United States, residing at Blue Island, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Lanterns, of which the following is a specification.

My invention relates to portable lanterns for trainmen and others. The lantern has electric lamps energized from a storage battery within the body of the lantern and in some respects is analogous to the lantern shown in my issued Patent, Number 1,088,120, granted to me February 24th, 1914.

One of the objects of my present invention is to provide improved mechanism operated by the bail of the lantern for switching the battery current on to and off of the lamp. Another object is to provide a yielding interlocking mechanism to prevent accidental rotation of the cam which operates the switch, and to prevent accidental movement of the rod which operates the switch. Another object is to provide against rattling of the parts within the casing when the lantern is in service. Another object is to provide a construction lending itself to a change in the number of lamps which may be lighted.

I obtain my objects by the mechanism illustrated in the accompanying drawings, in which:

Figure 1 is an elevation of the complete lantern, chiefly in axial section.

Fig. 2 is a perspective view of the vertically moving rod which operates the main switch.

Figs. 3 and 4 are views showing positions of said rod and its operating mechanism.

Fig. 5 is a sectional detail of the cam plate and the head of the switch rod.

Fig. 6 is a sectional view showing one of the bail trunnions and associated parts.

Fig. 7 is a plan section on the line 7—7, Fig. 1.

Fig. 8 is a perspective view of the battery or dry cell.

Figs. 9, 10, 11 and 12 are respective views of various component elements of the lantern.

Fig. 13 is a side view of the bottom lamp socket.

Fig. 14 is a plan view, on a reduced scale, showing the retaining spring and associated parts immediately beneath the lantern cover.

Fig. 15 is a sectional view showing one of the bail trunnions and associated parts.

Similar numerals refer to similar parts throughout the several views.

The body or barrel of the lantern consists of a casing 1 having a convex bottom 2 and supported upon legs 3 of any suitable type. At the top of the casing is a cover 4. The bail 5 is pivoted upon trunnion pins which pass through the sides of the casing as best shown in Fig. 1. These will be hereinafter described in detail. According to the present design, the lower end of the bails bear against bosses 7, 7 which are brazed or otherwise secured to the sides of the casing.

The battery has a water-tight casing 10 inclosed within a jacket 11. In the form selected to illustrate the invention, this battery is a so-called "dry" cell of cylindrical form having terminal strips 12, 12 leading down from the top of the battery along the sides just inside of the jacket 11 and ending respectively in the center terminal 13 and outer terminal 14. These terminals are resilient and cushion the battery upon its support. The battery is supported by a frame having a base plate 15 carried by a pair of side arms 16 suspended from the trunnion pins previously mentioned. A layer 17 of insulating material overlies this base plate, and supports the center contact 18 and the contact ring 19. Said center contact is a centrally located disk which engages and supports the center terminal 13 of the battery. A screw 20 screws into center contact 18 and forms a center contact for the lamp socket at the bottom of the lantern. This socket has an external shell 21 which is in permanent electric contact with the main switch 22 which is resilient and when upwardly pressed engages the lug 23 formed

upon the ring 19, as best shown in Figs. 1 and 3. Said ring forms the outer contact for engaging and supporting the outer battery terminal 14. On account of the ring formation of part 19 the battery terminal will always make contact with it regardless of the position to which the battery is rotated.

Switch 22 is insulated from the screw 20, and a layer 24 of insulating material insulates said spring from the base plate 15. A single lamp may be screwed into the socket 21 but in the present drawings I have shown a double cluster screwed into it, said cluster having two pull sockets 26 and 27 for accommodating the lamps 28 and 29 respectively. With this arrangement, the lantern may be used by trainmen to give different signals by using different colored lights. For instance, the bulb of one of the lamps may be red and the other white or green, or blue, depending upon requirements. The user may then show either one of two signal colors, or both or neither of them.

From the foregoing, it will be evident that the current may be turned on or off the lamp by moving the switch 22 into or out of engagement with the lug 23 of the ring 19. The mechanism for accomplishing this will now be described.

Arranged along one side of the casing, between it and the battery, (at the left in Fig. 1) is a rod 31 which has a screw 32 at its lower end. This screw engages the under side of the switch 22 and when raised raises said switch into engagement and electrical contact with the lug 23 which forms a part of the contact ring 19. As the screw is adjustable and the rod 27 is somewhat resilient, they afford means for regulating the amount of pressure which the screw shall exert upon the switch for a given amount of vertical movement of the rod. The means for operating the rod vertically are shown in detail in Figs. 3 and 4. At the upper end of the rod is a plate 33 which has a vertical slot 34 (see also Fig. 2) which accommodates the trunnion pin 35. Said pin is shown at the left of Fig. 1 and in detail in Fig. 15. Said pin is rotatable and journaled in the side of the casing 1. It has a squared portion 36 which fits into a square hole in the lower end of the bail 5 with the result that the pin will be rotated when the bail is swung from side to side. A nut 37 screws on to the outer end of said pin to hold the parts assembled. Pin 35 also has a squared portion 38 near its inner end which fits in a square hole in the cam 39. An actuating arm 40 is rigidly fastened to the inner end of the pin and consequently rotates in unison with the bail. A spring 41 acts as a resilient spacer between the inside of the casing and the outside of the adjacent arm 16 of the frame which supports the battery. This prevents sidelash or rattling of the battery support in the casing. The plate 33 has a flange 43 into which the nose of the cam fits when the parts are in the position shown in Fig. 3. A tongue 44 is pressed out of the cam 39 and is in position to be engaged by the arm 40 when the latter is rotated. The parts are so constructed and proportioned that when the bail stands upright, it may be swung through a considerable angle, for example more than 180 degrees, without engaging the tongue 44. When the cam is in normal position shown in Fig. 3, the plate 33 and rod 31 will be lowered to the position shown in Fig. 1 and the lamps will not be energized. By rotating the bail to an extreme position toward the right (Figs. 3 and 4), the arm 40 will engage the side of the tongue 44 and rotate the cam to the position shown in Fig. 4. This will raise the switch-operating rod 31 and bring the main switch 22 into engagement with the lug 23 on the contact ring 24 and thus cause the lamps to be energized. After the lamps have been thus energized the bail may be swung through a wide angle on each side of the normal upright position without affecting the switch-operating arm 31 because, as will be seen from Figs. 3 and 4, the arm 40 which rotates in unison with the bail, can swing through a wide angle without engaging the tongue 44. When it is desired to extinguish the lamps, the bail is swung far to the left (Figs. 3 and 4) until arm 40 engages the top of tongue 44, after which a slight additional movement of the bail will return the cam to the position shown in Fig. 3. In order to give freedom of movement to the bail without affecting the lamps, the parts are so designed that the arm 40 will not engage the tongue 44 on one side until the bail is swung down almost into engagement with the legs of the lantern and will not engage the tongue on the other side until the bail has been swung down on the other side almost into engagement with the legs. In other words, there is a great deal of lost motion and it is only at the extreme limits of the throw of the bail that it will operate to light or extinguish the lamps.

In order to insure against accidental rotation of the cam 39, two holes 47 and 48 are punched in the plate 33, and a boss 49 is pressed into the cam in such position as to snap into one or the other of said holes and thus yieldingly hold the cam in one or the other of its principal positions.

It is desirable that the bail stand upright at certain times or that it and the lantern body tend to move as a single unit. This effect is obtained chiefly through the mechanism illustrated in detail in Fig. 6. The

trunnion pin 51, which is opposite to the trunnion 35, shown in Fig. 15, has a squared portion 52 fitting in a square hole in the lower end of the bail. A disk 53 is formed at the inner end of the trunnion pin and this has two holes 54 which receive bosses 55 pressed out from the spring 56 which is riveted or otherwise fastened to the side arms 16. Thus when the bail is rotated, the disk 53 rotates with it and when the bail is upright, the bosses 55 snap into the holes 54 and yieldingly prevent rotation of the bail. The holes and bosses are so placed that when they are coöperating the bail will stand upright. A slight pressure on the bail, however, is sufficient to release the parts and thereafter the bail will swing freely. A nut 57 screwing onto the outer end of the trunnion pin 51 holds the parts assembled.

It is important that one or more extra lamps be stored in the lantern for use in case the acting lamps are burned out. For this purpose a cup 60 is mounted within the battery as shown in Fig. 1. This cup, which is shown in perspective in Fig. 9, has an annular flange 61 at the top which rests upon a gasket 62, shown separately in Fig. 10. The cup is large enough to store an extra lamp and is contained within a distributing receptacle 63, shown separately in Fig. 11. This receptacle is spaced from the cup and has a number of apertures 64 at the sides and bottom for distributing water to the contents of the battery. It will be understood that the so-called "dry" cells require moisture and this moisture is apt to evaporate in time. Consequently, it is customary to replenish this supply occasionally. In the construction shown, the distributer 63 is countersunk into the battery material near the top, and by removing the cup 60 and pouring in water, the water will be distributed to different parts of the battery.

The cup is normally held seated by a cross bar 65 of rubber having a rod 66 passing through its center. Said rod is detachably secured at the ends to branches 67 which are pressed out from the side arms 16. Overlying the cross bar 65 is a platform composed in the present case of two plates 68 and 69. These are normally pressed down by a spring 70 which is here shown in the form of an arch fastened at the center to the inside of the cover 4. These parts are shown in detail in Fig. 14. Above the plates 68 and 69 is another plate 71 which has an aperture or pocket 72 which forms a seat for the extra lamp shown at the top of Fig. 1.

In order to hold the base of the lamp cluster firmly in the socket 21 at the bottom of the lantern, it is desirable to cut vertical slots 74 in the sides of the socket so that it will be resiliently collapsible to a certain extent. A helical spring 75, shown in Fig. 12, is coiled around the outside of the socket and presses it against the sides of the base 76 of the cluster. Thus, I increase the amount of friction between the cluster base and the socket and this tends to hold the cluster firmly and prevent it from jarring loose.

The operation of the lantern will be readily understood from the foregoing description. After the parts are assembled as shown in Fig. 1, the main switch 22 can be operated to light or extinguish the lamps by swinging the bail down as far as it will go in one direction or other, depending upon what effect is wanted. The bail will normally be held upright through the operation of the friction spring 56, but by exerting a slight pressure to release the bail from this upright position, it may be swung 90 degrees or more either to the right or left of neutral position without affecting the main switch. The operating cam 39 is frictionally held in closed or open position by the boss 49 entering one or the other of the holes 47, 48, as best shown in Fig. 5. Practically no care is required to see that the battery is inserted properly because the ring contact 19 will engage the outer battery terminal 14 no matter what position said terminal may occupy. As terminals 13 and 14 are resilient, they form a cushion support for the battery and the spring 70 inside of the top cover 4 gently but firmly holds the battery seated. Lateral vibration of the battery is prevented by the spring 41, shown in detail in Fig. 15. It will be noted that the lantern has storage capacity for two extra lamps and by removing the cover and the lamp cup 60, water may be introduced into the distributer 63 and thus enable the water to penetrate to various parts of the battery. By running the battery strips 12 along the side of the battery and extending them under the bottom of the battery, the weight of the battery is utilized to hold the terminals in engagement with the stationary contacts 18 and 19. At the same time, the battery itself remains right side up so there is no danger of spilling out any of the surplus moisture of the battery.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. An electric lantern having a stationary casing for the battery, a bail pivoted thereto near the top, a rotatable arm actuated by said bail, a lamp socket at the bottom of the casing, terminals at the botom of the casing for supporting the battery and being energized thereby, a switch in the casing for putting the socket and lamp in circuit, the switch being located at the bottom of the casing, and a vertically movable rod for operating said switch, said rod extending

upward from said switch to and being operated by said rotatable arm.

2. An electric lantern having an outer casing, a bail pivoted to it near the top, whereby the casing tends to hang vertically, a battery, vertically yieldable resilient battery terminals at the bottom of the casing, one near the center and one near the outer edge of the battery, a stationary center contact for engaging the center terminal of the battery, a stationary ring contact concentric with the center contact for engaging the outer terminal of the battery, an electric lamp, a switch at the bottom of the casing for putting the lamp into and out of circuit with said center contact and ring contact, and means operated by the bail for operating said switch.

3. An electric lantern having a stationary casing, a center contact and an outer contact concentric with the center contact mounted at the bottom of and within the casing, a switch also mounted at the bottom of and within the casing, said switch being adapted to electrically connect the center contact and the outer contact for lighting the lamp, a bail pivoted to the casing near the top thereof whereby gravity tends to hold the casing suspended in an upright position, and a vertically movable bail-operated member located within the casing for operating said switch.

4. An electric lantern having a lamp, a battery, a stationary casing adapted to hold the battery in substantially fixed position, a bail pivotally connected to the casing near the top for supporting it in vertical position, a switch near the bottom of the casing for illuminating and extinguishing the lamp, and vertically slidable means mounted in the casing and movable relatively to it and the battery and actuated by the bail for operating said switch.

5. An electric lantern having a lamp, a battery, a stationary casing for holding the battery in fixed position, a bail pivotally connected to said casing and supporting it, a movable switch for putting the lamp into and out of electric connection with the battery, a cam plate for operating said switch, and a rotatable cam for moving said plate to "on" and "off" position, said cam being rotated by said bail in its swinging movement about its pivots.

6. An electric lantern having a lamp, a battery, a stationary casing adapted to hold the battery in substantially fixed position, a bail pivotally connected to said casing for supporting it, a switch for turning the battery current on to and off of the lamp, a rod vertically movable in the casing for operating said switch, a cam plate for operating said rod, a rotatable cam for moving said plate to "on" and "off" position, an arm fastened to said bail and rotating in unison therewith, said arm being adapted to engage said cam and having lost motion whereby the arm engages the cam only near the end of the swinging movement of the bail in either direction.

7. An electric lantern having a lamp, a battery, a stationary casing adapted to hold the battery in substantially fixed position, a bail pivotally connected to said casing at a point near the top, a switch at the bottom of the casing for turning the battery current on to and off of the lamp, a switch-operating member slidably mounted upon said casing for operating said switch, and means operated by the bail and movable relatively to the casing and battery for moving said member in accordance as the bail is swung to the right or toward the left from normal upright position.

8. An electric lantern having a lamp, a battery, a stationary casing for holding the battery in fixed position, a bail pivotally connected to said casing, a switch for turning the battery current on to and off of the lamp, a switch-operating member operated by the swinging movement of the bail, and a screw adjustably mounted on said switch-operating member for engaging said switch to operate it.

9. An electric lantern having a casing, a battery within said casing, a lamp socket carried by the casing, a bail, means operated by the bail for switching current on and off of the socket, a cluster screwing into said socket, and a plurality of lamps of different colors in said cluster, said lamps having means for turning them on and off individually, whereby the operator is, without changing lamps, afforded the option of exhibiting the different colors.

10. An electric lantern having a casing, a bail pivoted to it for supporting it, a lamp, a battery for energizing the lamp, a switch for turning the battery current onto and off of the lamp, and a cam mechanism for operating said switch, said cam mechanism including a controlling member, a cam for operating said controlling member, an arm for engaging said cam, there being lost motion between the arm and the cam, and the arm being rotated by the bail, and yielding interlocking means between the cam and the controlling member whereby accidental movement of the cam is prevented.

11. An electric lantern having a casing, a bail pivoted to it for supporting it, a lamp, a battery for energizing the lamp, a switch for turning the battery current onto and off of the lamp, a controlling member movable relatively to the casing for operating said switch, a rotatable cam for operating said controlling member, an arm operated by the bail for rotating the cam, there being lost motion between the arm and the cam, and

yielding interlocking means between the cam and the controlling member whereby accidental rotation of the cam is prevented.

12. An electric lantern having a casing, a bail pivoted to it for supporting it, a lamp, a battery for energizing the lamp, a switch for turning the battery current onto and off of the lamp, a rod vertically movable in the casing for operating said switch, a rotatable cam for operating said rod, an arm operated by the bail for rotating the cam, there being lost motion between the arm and the cam, and a mating depression and projection on the rod and on the cam for yieldingly preventing the accidental rotation of the cam.

In witness whereof I have hereunto subscribed my name.

FRANK T. BAIRD.