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BOMBING MECHANISM FOR AIRCRAFT

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Fig. 1

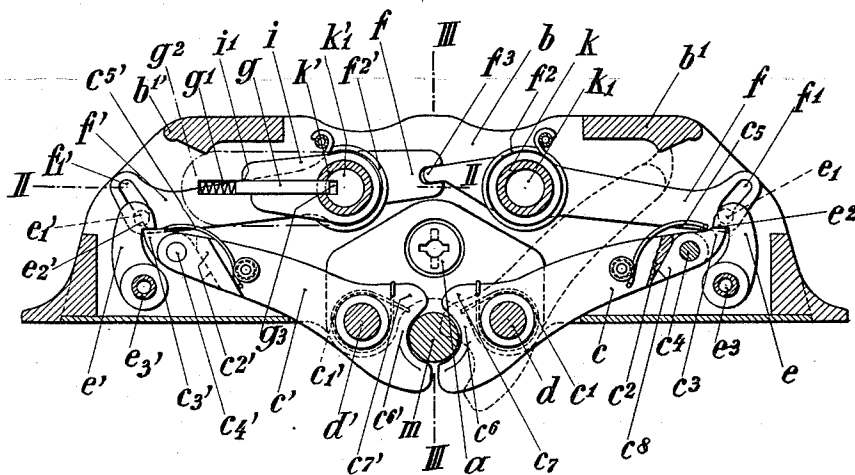


Fig. 2

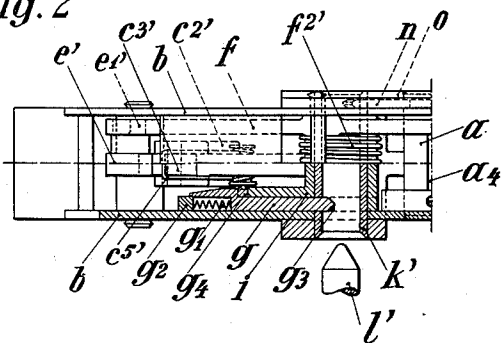


Fig. 3

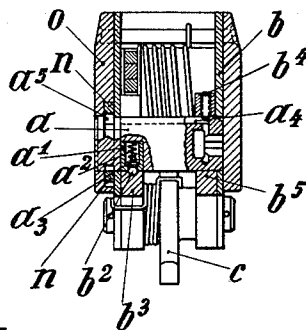
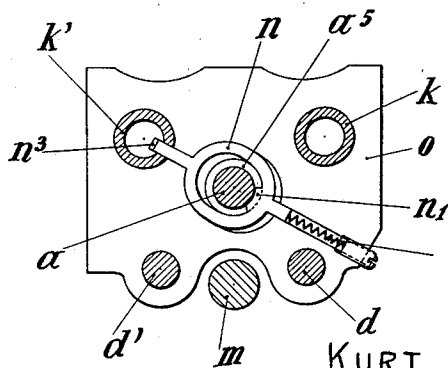


Fig. 4



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BOMBING MECHANISM FOR AIRCRAFT

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9 Claims. (Cl. 89—1.5)

The bombing mechanism of aircraft has recently been provided with bomb locking devices which serve a second purpose by forming part of the hoisting means for loading the bomb into the aircraft. These devices were arranged to be removable from their positions in the bomb chamber of the craft so that one could be placed over and coupled to a bomb by means of the locking members on the device and then, by means of a winding cable attached to the device, the bomb could be hoisted into the position it is to occupy in the bomb chamber.

When the device is in the bomb chamber it is held in its proper position, in which the locking members of the device can be actuated by the release mechanism of the craft, by releasable coupling members.

In the known arrangements it is possible that the vibrations and shocks which are normally experienced in hoisting a bomb into the craft may accidentally actuate the locking members of the device and permit the bomb to be released, to the grave risk of both the apparatus and the crew. The bomb may also drop accidentally if, as is possible, the device comes adrift from the winding cable by reason of the unreliable nature of the coupling between these parts which was employed in the past.

The main object of the present invention is to make the loading of bombs into aircraft more safe.

Accordingly, a bomb locking device according to the invention is provided with means which secure the locking members of the device against release from the positions in which they engage the bomb while the device is removed from its normal position in the bombing mechanism in the bomb chamber.

Preferably the invention further provides means for placing the securing means out of action once the device is coupled in its proper position in the bomb chamber so that the device is then automatically placed in condition to release the bomb under the control of the dropping mechanism of the craft.

Further securing means may also be provided in the device for coupling the locking device with the winding cable and such means may also be automatically actuated when the locking device reaches its proper position in the bomb chamber.

The accompanying drawing shows a locking device for bombing mechanism which is provided with securing devices according to the invention.

Fig. 1 is a longitudinal section through the locking device.

The lower part of Fig. 2 is a section along the line II—II of Fig. 1, the upper part is a view from above of the left half of the locking device.

Fig. 3 is a section along the line III—III of Fig. 1.

Fig. 4 shows a detail.

The housing *b* of the locking device can be fixed to a winding cable by means of a bolt *a*, for example by threading the bolt through a loop in the end of the cable into its position in the middle of the casing of the locking device.

The carrying lug *m* of a bomb is held in the closed position of the locking device between the centrally disposed fork ends *c*₂, *c*₂' of the locking arms *c*, *c*' which are mounted on bolts *d*, *d*' so as to be rotatable in the housing *b*. After the release of the bomb the locking arms *c*, *c*' adopt the position shown by the dotted lines on the left hand side of Fig. 1, in which their outer ends *c*₃, *c*₃' rest against the shoulders *b*, *b*' of the housing *b*. The arms *c*, *c*' are held in this position by means of the springs *c*₁, *c*₁'.

When the locking device hanging from the cable of the windlass is detached from its support in the bomb chamber and is lowered in the open position on to a bomb the upper arms *c*₁, *c*₁' of the fork ends *c*₂, *c*₂' hit the carrying lug *m* of the bomb.

On further lowering the locking device the pressure due to the weight of the locking device and cable forces the arms *c*, *c*' out of the position shown in dotted lines in Fig. 1 into the full line position. The arms are held in this position by means of hooked arms *e*, *e*' which are mounted on bolts *e*₂, *e*₂' so as to be rotatable in the housing *b*. Thereby the locking device grips the bomb at its lug *m*. The bomb can now be raised into the bomb chamber of the aircraft by means of the locking device and the winding cable which emerges from the bomb chamber.

When the bomb is properly raised into the chamber it meets stops which limit its upward movement, and bores *k*₁, *k*₁' in sleeves *k*, *k*' formed in the housing come into register with corresponding holes in the walls of the chamber so that by inserting bolts *l*, *l*' in the holes the locking device and bomb can be secured in the chamber. The locking device can then be released from the hoisting cable by removing the bolt *a*.

At the outer ends of the arms *c*, *c*' pawls *c*₃, *c*₃' are rotatably mounted on bolts *c*₄, *c*₄' in forks *c*₂, *c*₂'. The pawls *c*₃, *c*₃' as shown in the right hand half of Fig. 1, bear with their arms

c_3, c_3' against the fork arms and are held in this position by springs c_5, c_5' so as to form elongations of the arms c, c' .

When however, by lowering the release gear on to the bomb the arms c, c' are rotated out of the dotted line position of Fig. 1, into the full line position, the pawls c_3, c_3' in striking against the hooked shaped projections e_2, e_2' of the arms e, e' are deflected in opposition to the closing movement, and thereafter straighten out, whereby they take up a position under the projections e_2, e_2' of the arms e, e' . The pawls c_3, c_3' can thus take up a position under the retaining hooks of the arms e, e' , when these are in their closing position.

By means of laterally projecting pins e, e' the levers e, e' are held in the curved slots f_1, f_1' of releasing levers f, f' which are mounted on sleeves k, k' so as to be rotatable in housing b . Under the influence of springs f_2, f_2' which tend to rotate the levers upwardly, the levers f, f' are held in the position shown, in which the lower ends of the slots f_1, f_1' bear on the pins e_1, e_1' of the hooked arms e, e' . The upper parts of the slots f_1, f_1' are curved outwards.

If, when a bomb is in position, the outer ends of the levers f, f' are rotated downwards by any known release mechanism until the upper ends of the slots f_1, f_1' bear against the pins e_1, e_1' of the arms e, e' the latter rotate outwards and the hooked projections e_2, e_2' release the pawls c_3, c_3' , of the arms c, c' . The arms c, c' then swing under the influence of the weight of the bomb over into the dotted line position. The bomb is thereby released and drops.

In order that both arms c, c' may be always simultaneously released, the release levers f, f' are positively connected by the device f_3 .

In order to prevent accidental opening of the release gear while the locking device and the bomb are being raised into the bomb chamber of the aircraft one of the release levers f, f' is provided with a securing bolt, which is first released when the release gear is secured by inserting the bolts $l',$ only one being shown on the drawing, into the bores k_1, k_1' of the sleeves k, k' .

The securing device consists in a stop bar $g,$ which is arranged in the housing b so as to be movable longitudinally, and which as long as the bolts l, l' are not inserted, held by means of the spring g_1 in a position in which its right hand end g_3 as viewed in the drawing projects into the bore k_1 of the sleeve k' . In this position the stop bar g bears with its lateral projection g_4 against a shoulder i_1 of a stop lever $i,$ which is fixed to the lever f' . Thus the lever f' is held fixed. As soon as the bolt l' is inserted into the sleeve $k',$ the stop bar g is pressed back and its projection g_4 releases the shoulder $i_1,$ so that now the levers f, f' can be rotated downwards and the locking device opened.

In order further to prevent the locking device and therewith the bomb, from breaking loose from the cable while the device is being raised, a second securing member is provided which secures the bolt a in its inserted position. In the form of construction shown in Figs. 1-3, this securing member consists in a feather a_3 (Fig. 3), which under the influence of the spring a_2 which lies in the socket $a_1,$ projects into the depression b_2 of the plate b_3 which is attached to the housing b . The winding pin b_4 which projects into the longitudinal keying a_4 of the bolt a and which is fixed in the plate b_3 of the housing b prevents the bolt a from being lost.

The securing mechanism of the bolt as shown in Fig. 4, and also Fig. 3, can also be formed in such manner that it is first released when the bolt l' is inserted (as in case of the securing device g of the lever f'). In this case the securing device is formed as a member n which is longitudinally movable in a plate c fixed to the housing. Under the influence of a spring n_1 the member n is held in a position in which its projection n_2 projects into a circumferential slot a_5 of the bolt a and its end n_3 projects into the bore of the sleeve k' . When the bolt l' is inserted the member n is pressed back and the bolt a is released. Thus the locking device can be detached from the cable of the winding gear only after it is properly fixed in the chamber.

I claim:—

1. Bombing mechanism for use with aircraft comprising means for engaging a bomb, a locking device having locking members adapted to hold the bomb, means for releasing the bomb, and a securing device adapted to automatically secure the locking members of the locking device when the releasing means are not in normal position in the bombing mechanism.

2. Bombing mechanism for use with aircraft comprising means for engaging a bomb, a locking device having locking members adapted to hold the bomb, means for releasing the bomb, a securing device adapted to automatically secure the locking members of the locking device when the releasing means are not in normal position in the bombing mechanism, and means for automatically placing the securing device out of action to secure the locking members when the device is coupled in its normal position in the bombing mechanism.

3. Bombing mechanism according to claim 2, in which the securing means comprises a latch which is spring urged into position to engage a movable member of the locking device and which is controlled by a bolt which couples the locking device with the bombing mechanism.

4. Bombing mechanism according to claim 2, in which the securing device permits the locking members to engage and hold a bomb when the securing means are in its operative position to prevent the locking members moving in the opposite direction.

5. Bombing mechanism according to claim 2, in which a pair of pivotally mounted arms is provided arranged to engage a bomb, pawls for holding the arms in the engaging position and movably mounted for tripping the pawls and releasing the pivotally mounted arms, and securing means biased to take up a position to stop movement of the movably mounted arms in the direction to trip the pawls.

6. Bombing mechanism according to claim 2, in which a pair of pivotally mounted arms is provided arranged to engage a bomb, pawls for holding the arms in the engaging position and movably mounted for tripping the pawls and releasing the pivotally mounted arms, and securing means biased to take up a position to stop movement of the movably mounted arms in the direction to trip the pawls, the securing device comprising a member slidably mounted and biased to enter a sleeve which accommodates a bolt when the device is in its normal position in the bombing mechanism, the member bearing a projection which is adapted to co-operate with one of the movably mounted arms.

7. Bombing mechanism according to claim 2, in which a second securing means is provided to

prevent the device being uncoupled from a winding cable when the device is removed from the bombing mechanism of the craft.

5 8. Bombing mechanism according to claim 2, in which second securing device is provided to prevent the device being uncoupled from a winding cable when the device is removed from the bombing mechanism of the craft, the second securing device being automatically controlled by the mechanism for securing the locking device in
10 the bombing mechanism.

9. A bomb hoisting, holding and releasing mechanism for use with aircraft comprising a

hoisting and holding device for the bomb having a locking device with locking members adapted to hold the bomb, and a securing device for automatically securing the locking members of the locking device when the hoisting and holding device is being hoisted into the aircraft to prevent accidental release of the bomb; and means for automatically placing the securing device out of action when the hoisting and holding device is in its normal position in the air-
10 craft.

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