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Gun Carriage For Turret Gun Slot Closures

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3 Claims. (Cl. 89—36)

1. This invention relates to closures for gun slots of turrets and the like and more particularly to a new and improved type of closure which is adapted to be moved with the gun as the latter is moved for aiming, and which closure is adapted to prevent the entrance into the turret, of wind, rain, snow, dirt, etc.

It has heretofore been proposed to provide a gun slot in the wall of a turret structure, such as those utilized on aircraft, for example, through which the gun is projected, the construction being such that the gun moves from one end of the slot to the other, as it swivels about a pivotal mounting within the turret. It is highly desirable in such types of installations to provide a slot closure cooperating with the gun together with some arrangement for completely closing the slot during movement of the gun and carriage, in order to prevent the entrance into the turret of wind, snow, rain, dirt, etc. Devices for this purpose, heretofore utilized have not been entirely satisfactory since they have not allowed free and easy movement of the gun under all conditions, and especially where the friction, due to wind pressure and air load is high.

It is accordingly one of the objects of the present invention to provide a gun slot closure embodying a novel construction and arrangement of parts, so constituted as to enable free and easy movement of the gun at all times, notwithstanding the increased loads thereon due to high wind pressure.

Another object of the invention is to provide a closure for a gun slot which is so constituted as to accommodate a plurality of guns which may be projected through the slot and which are movable in unison about a pivotal mounting within the turret.

A further object is to provide a combined carriage and gun slot closure of the above type wherein freedom of movement of the guns is secured notwithstanding that the carriages may be moved relative to each other as the guns are swiveled.

A further object is to provide in a device of the foregoing character, a novel arrangement whereby the carriages for the guns are capable of relative movement, and the closure members are so guided that the gun slot remains closed at all times.

A still further object includes the provision of a novel arrangement whereby a metal band forms a part of the closure and is readily detachable from the gun carriage, whereby the slot may be quickly opened if desired.

2. Still another object is to provide a novel gun barrel receiving device or carriage for a slot closure structure of the above type, which is readily demountable.

A further object resides in the provision of a novel construction whereby the carriages for the guns and the metal bands are guided throughout their movement in the slot, in an efficient and substantially frictionless manner, whereby the gun slot closure construction offers substantially no resistance to the swiveling of the guns, thereby greatly facilitating the efficient operation of the latter.

A still further object is to provide a device of the above character which will be extremely efficient in its operation and which comprises relatively few parts, which may be economically manufactured and assembled.

Other objects and novel features of the invention will appear more fully hereinafter, from a consideration of the following detailed description when taken in connection with the accompanying drawing, which is illustrative of one form of the invention. It is to be expressly understood, however, that the drawing is for purposes of illustration only, and is not designed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawing, wherein similar reference characters refer to like parts throughout the several views:

Fig. 1 is a fragmentary view of a portion of an airplane turret, the upper part of the turret being broken away to more clearly illustrate the gun carriages and gun-slot closure of the present invention;

Fig. 2 is a front view of one of the gun carriages, with a portion of the closure bands secured to opposite sides thereof;

Fig. 3 is a sectional view taken along line 3—3 of Fig. 2 and looking in the direction of the arrows;

Fig. 4 is a sectional view taken along lines 4—4 of Fig. 2, and

Fig. 5 is a side view of the quick-detachable connection between the closure band and the gun carriage.

Referring to the drawing, a gun-slot closure constructed in accordance with the principles of the present invention is illustrated therein as being associated with a turret 10 positioned on an aircraft 12 and projecting outwardly therefrom, the upper portion of the turret being broken away for purposes of clarification. The turret is provided with a gun slot 14 in the wall thereof.
having a top 16 and a bottom 18, and through which the barrels 20 of a pair of guns 22 are pro-
jected. The guns are adapted to be simul-
taneously moved by any suitable mechanism, not
shown, about a common pivot a, and when so moved, the barrels may move in the slot.
While two guns have been illustrated, it will be
understood that the invention may be used with
one or more guns, as will appear more fully here-

In order to prevent the entrance of wind, snow,
rain, dirt, etc., into the turret through the gun
slot, means are provided by the present invention for effecting a closure of the slot, the construc-
tion being arranged in such a manner that the closure
is operative at all times regardless of movement
of the guns in the slot. As shown, such closure
includes a carriage 24, through which the barrels
20 of each of the guns project, opposite sides
of each carriage being connected with flexible or
bendable, metallic ribbons or bands 26 and 28.
Each of the latter has its opposite edges guided by
upper and lower tracks 30 and 32 respectively,
and the free ends of the bands are associated with
spring roller drums 34, mounted within the turret
and adjacent at each end of the slot 14. The drums
34 may be of any suitable construction and serve
to wind and unwind the bands as they move along
the tracks during movement of the guns. As
illustrated in Fig. 1, the lower track 32 extends
throughout the entire length of the slot 14, and
the upper track 30 is similarly arranged, such
construction ensuring a firm support for the
bands.

In installations where a pair of guns are em-
ployed, as shown in Fig. 1, it will be readily ap-
preciated that as the guns swivel about the pivot
a, the carriages 24 will be moved relatively to
each other. In order therefore to effectively
close that portion of the slot 14 between the car-
rriages 24 under these conditions, each of the
carriages has secured to its adjacent sides, a
relatively short flexible metallic tape or band
36, the bands being guided in the tracks 30 and
32 and arranged in overlapping relation. It will
be understood that each band 36 is of sufficient
length, that it will remain in overlapped rela-
tion with the other and close that portion of the
slot between the carriages throughout the
entire extent of travel of the carriages in the slot.

Each of the carriages 24 is similar in construc-
tion, and the arrangement is such that they will
be guided along the tracks 30 and 32 as the guns
swivel. One of the carriages 24 is illustrated in
detail in Figs. 2, 3 and 4, and includes top and
bottom plates 36 and 40 respectively, between
which a cylindrical member 42 is positioned, the
said member being rotatably mounted, as by
means of stub shafts 44 and 46 projecting
through suitable openings in the plates. The
top portion 36 is provided with laterally extend-

Means are provided for attaching the bands
26 and 28 to the carriages 24 and since such
means is identical in each case, one only will be
described. As shown, a shaft 47 is connected by
the ears 45 and 48 and carries a clip 98, the
end of the band 26 extending between walls 100
and 102 of the clip and being detachably sec-
dured thereto in a manner which will appear
more fully hereinafter and the portions of each of
the walls 100 and 102 are respectively extended upwardly and downwardly and bent outwardly in order to form pairs of
ears 104, 106 and 108, 110, which embrace and
bear against the outer surfaces of the tracks
30 and 32.

In order to detachably connect the band 26
to the clip 98, the walls of the latter and the end
of the band are provided with aligned open-
ings through which a pin 112 is projected. The
pin 112 is carried by a spring strip 114, one end
of which is secured to the band in any suitable
manner, and the other end of which is bent out-
wardly, as shown at 116 in Fig. 4. An angle
piece 118 is secured to the band 26 at a dis-
tance from strip 114 such that the thumb and
forefinger may be engaged with the part 116
and piece 118 and the spring strip 114 flexed in
order to withdraw the pin 112 and disconnect
the band 26 from the clip 100. The band will
then be rolled up by the spring roller 34 and thus
opens the gun slot.

In the event that only one carriage is em-

latter being attached to the members as by
means of screws 58, and being of sufficient width
as to close any space which may exist between
the members 52 and 54 and the cylindrical mem-
ber 42. From this construction, it will be read-
ily perceived that when the plates 56 are se-
cured to the two parts of each of the members
52 and 54, the carriage assembly will be rigidly
held together.

The cylindrical member 42 is provided with a
pair of aligned openings 60 and 62 through which
the gun barrel 20 projects and the entire car-
rriage assembly thus engages the barrel as by
means of rollers 64 and 66, suitably rotatably
mounted in the member 42 and having respec-
tive concave portions 68 and 70 engaging the
barrel. Thus, the rollers 64 and 66 enable sub-
stantially frictionless relative movement be-
tween the carriage 24 and the barrel 20 as the gun swiv-
els about its mounting.

In order to guide the carriage 24 along the
tracks 30 and 32, a plurality of pairs of cooper-
atlng rollers are provided and preferably, such
rollers are mounted on the carriage 24 in such
manner as to be readily removable therefrom.
As shown, each of the pairs includes a roller 50
and 52 extend between ears 45 and 48 on opposite sides of the band 26, Fig. 3, the
opposite ends of the shafts being provided
with upper and lower rollers 76, 78 and 80, 82,
respectively. The ears 47 and 50 likewise sup-
port a pair of shafts 54, 56 which carry upper
and lower rollers 85, 87 and 88, 90 respectively.
Each of the foregoing rollers is removably
mounted on the respective shafts in any suit-
able manner, as for example, by using the well-
known type of C-shaped washer adapted to en-
gage a slot in the end of the shaft. Moreover,
the rollers of each upper and lower pair respect-
ively engage opposite sides of the tracks 30
and 32, the latter being constituted by angle
strips or guides 52 and 94 between which the
edges of the bands 26, 28 and 30 are received, see
Fig. 3.
ployed, the band 28 is connected to the opposite side of the carriage 24 in the same manner as that above described. In the construction illustrated, however, the ends of the tapes 36 are preferably connected to the adjacent sides of the carriages 24 as by being riveted or otherwise secured between the side walls of a clip 120 carried by shaft 122, although it will be understood that the detachable pin connection hereinafore described with reference to clip 100 may be employed if desired.

In operation, the various parts are assembled as illustrated, the carriages 24 receiving the barrels 20 of the guns and the tracks 30 and 32 receiving the upper and lower edges of the bands 26, 28 and 36. With the rollers 76, 80, 55 and 56 contacting the outside surface of the tracks and rollers 78, 82, 87 and 90 engaging the inside surface of the tracks, it will be seen that a rigid structure is provided which may be readily moved along the gun slot with a minimum of friction. During such movement, the overlapping bands 36 shift with respect to each other in accordance with relative movement between the carriages 24. Both carriage structures are actuated by the gun barrels and it will be readily appreciated that since the cylindrical member 42 is rotatably mounted on the plates 39 and 45, and the rollers 64 and 66 are also rotatably supported on said plates, these parts of the carriage will have free and easy movement with respect to each other during movement along the slot. Hence, resistance to movement of the gun has been practically eliminated by the construction employed, so that more rapid and efficient aiming of the guns will result.

There has thus been provided by the present invention, a novel and improved gun slot closure which closes the gun slot throughout all movements of the guns and offers substantially no resistance to such movements. The provision of the overlapping bands 36 secures closing of the slot between the spaced carriages 24 notwithstanding the fact that relative movement between these carriages occurs by reason of the pivotal mounting for the guns and the shape of the turret. A further important feature resides in the demountable construction of the carriage and the use of the plates 56 secured to the members 52 and 54 for securing the assembly together and for closing any opening between the cylindrical member 42 and the members 52 and 54. The quick detachable connection afforded by the pin 112 is highly desirable in enabling the gunner to quickly open the gun slot, and it is to be understood that this connection may be utilized, if desired, between the ends of all of the bands and one or more carriages.

While one form of the invention has been shown and described herein, it will be readily understood that various changes may be made therein, by those skilled in the art, without departing from the spirit of the invention. Reference will therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. A gun carriage for a turret gun slot closure of the type in which the carriage is movable along the slot and bands are attached respectively to each side of the carriage and extend along the slot to close the same, comprising a pair of spaced connected plates, a substantially hollow cylinder rotatably mounted on said plates and disposed between them and having an opening therethrough which the barrel of a gun is adapted to project, and a pair of rollers rotatably supported within the cylinder and adapted to engage opposite sides of the barrel.

2. A gun carriage according to claim 1 comprising, in addition, a plurality of pairs of rollers rotatably carried by said plates and adapted to engage parts of the turret to guide the movement of the carriage along the slot therein.

3. A gun carriage according to claim 1, comprising in addition ears extending from each plate laterally beyond the cylinder on each side thereof, and means connected between the ears on each side of the cylinder for attachment to one of the slot-closing bands.

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