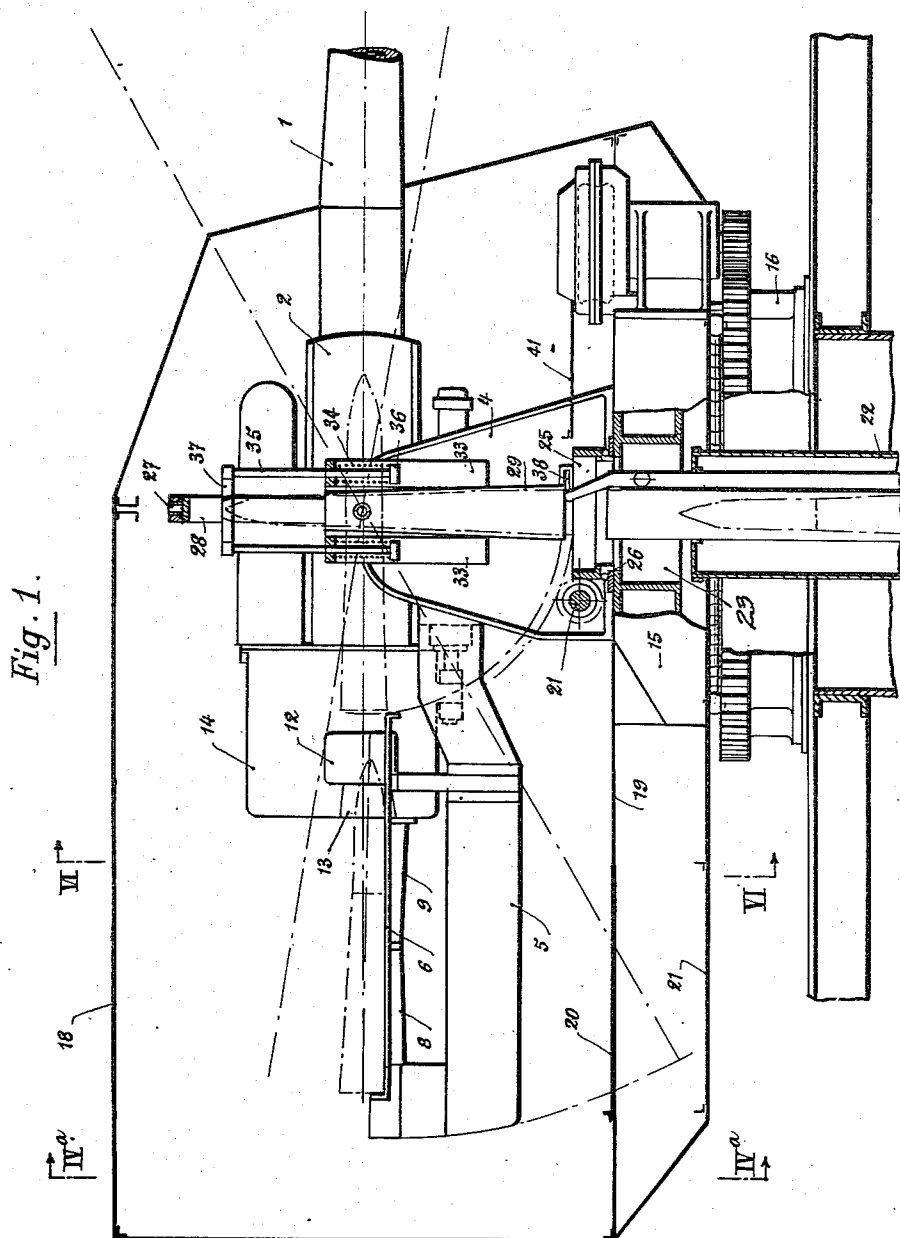


June 11, 1935.

L. DAUM
AMMUNITION SUPPLYING DEVICE FOR PAIRS OF
GUNS MOUNTED IN TURRETS OR THE LIKE
Filed July 24, 1933

2,004,855

6 Sheets-Sheet 1



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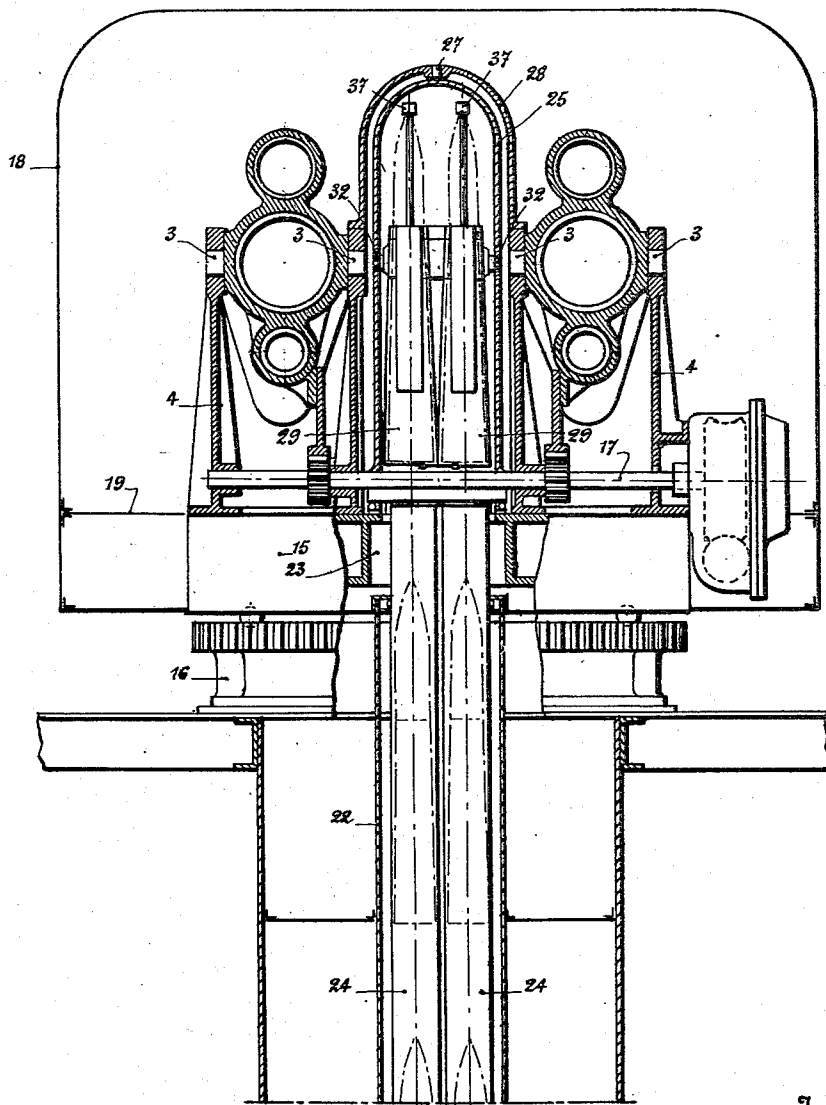
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6 Sheets-Sheet 2

Fig. 2.



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6 Sheets-Sheet 4

Fig. 4.

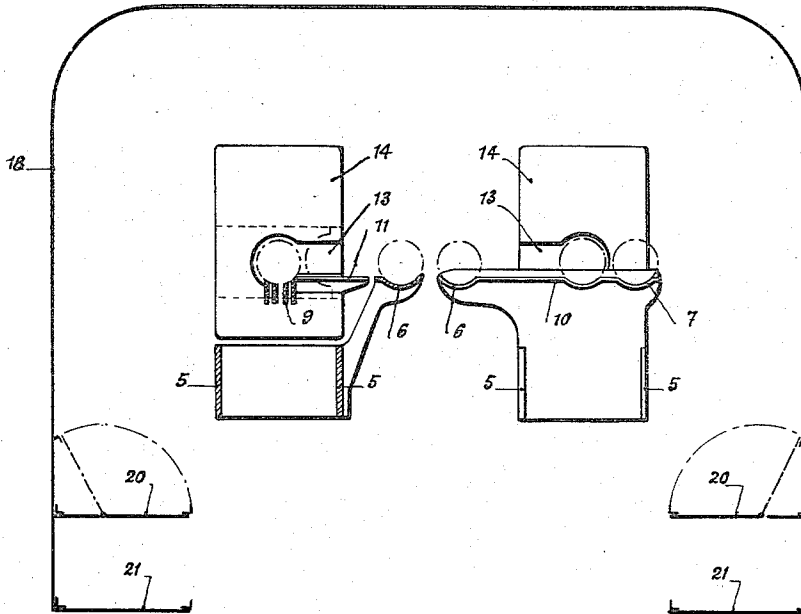
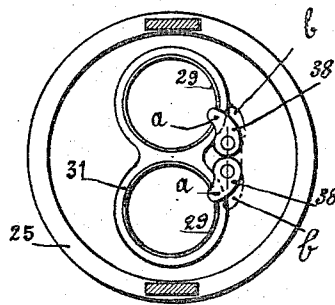


Fig. 7.



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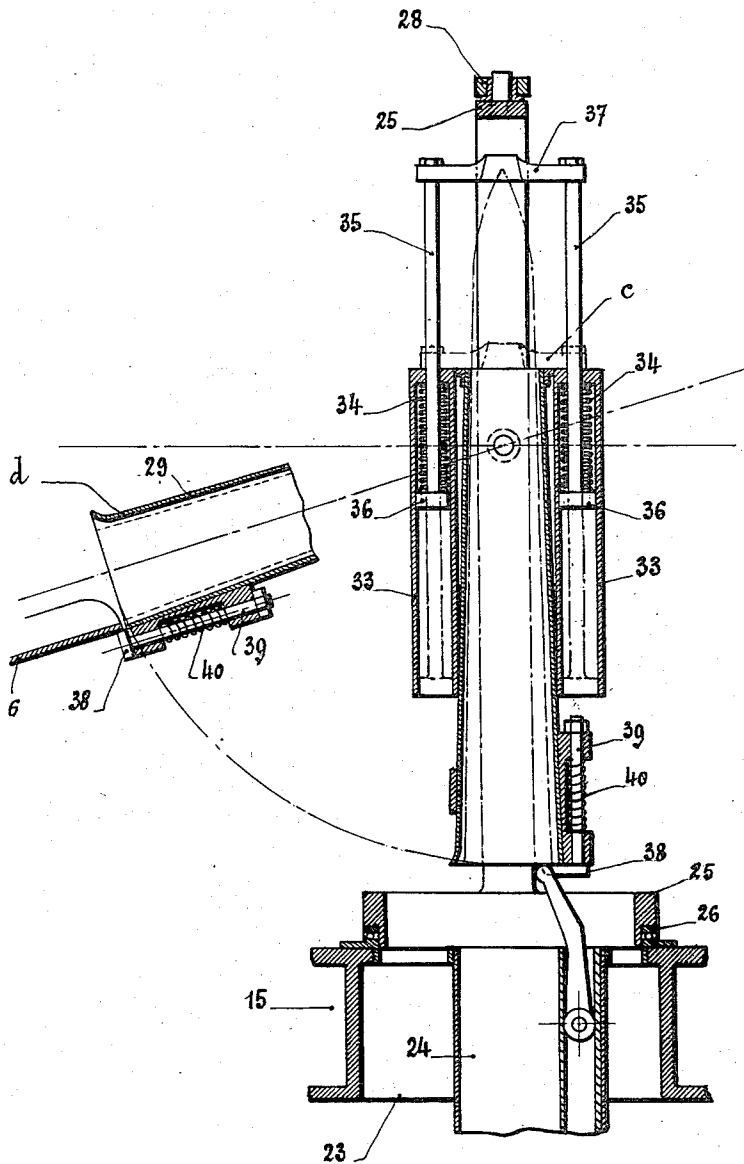
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Fig. 5.



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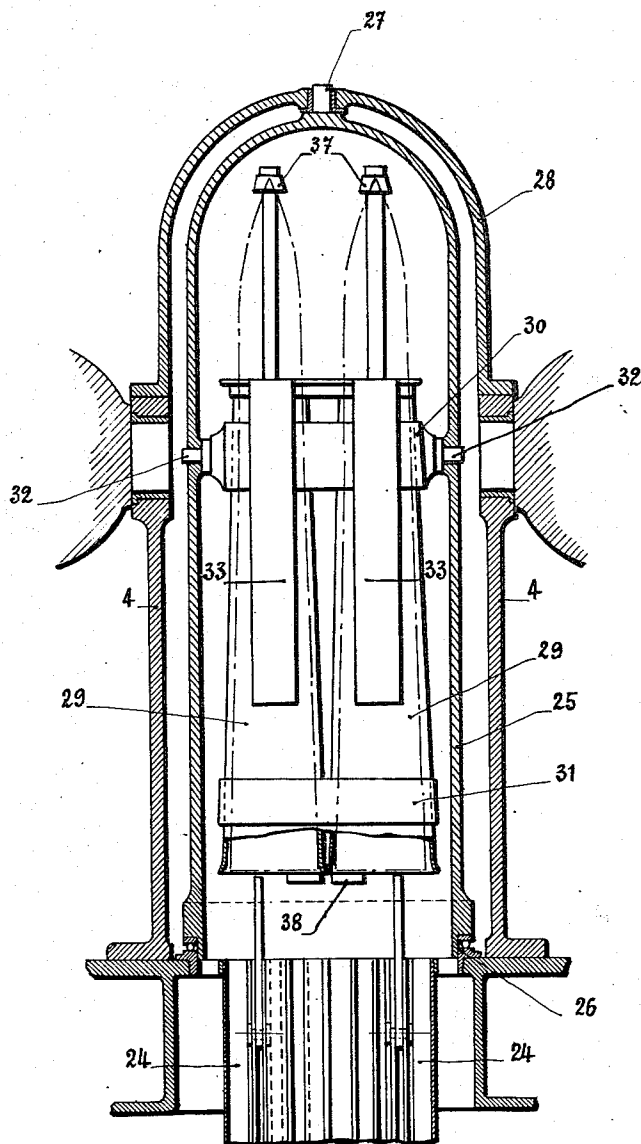
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6 Sheets-Sheet 6

Fig. 6.



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UNITED STATES PATENT OFFICE

2,004,855

AMMUNITION SUPPLYING DEVICE FOR
PAIRS OF GUNS MOUNTED IN TURRETS
OR THE LIKE

Leon Daum, Paris, France, assignor of one-half
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of France, and one-half to Compagnie des
Forges & Acieries de la Marine et d'Homecourt,
Paris, France, a company of France

Application July 24, 1933, Serial No. 681,980
In France August 19, 1932

20 Claims. (Cl. 89—45)

The present invention relates to a device for simultaneously supplying with ammunition two guns associated for simultaneous aiming in direction.

5 The device according to the invention is more particularly applicable to pairs of similar guns, adapted for simultaneous aiming in direction, installed in turrets on vessels of small or medium tonnage. The invention is applicable, however,
10 in a general manner not only to pairs of guns installed on board a ship or other vessel, whether or not the said guns are mounted in a turret, but even to pairs of guns for coast defence.

15 It is known that in order to supply with ammunition, more particularly with cartridges, pairs of guns adapted for simultaneous aiming in direction, it has already been proposed to employ a hoist arranged in a swivelling shaft in
20 such a manner that pairs of cartridges may be brought to the mouth of the shaft of the hoist along a direction parallel to the firing planes of the guns, and may thus be transferred readily to loading devices. This known means possesses a relatively large number of disadvantages. The
25 necessary pivoting of the swivelling shaft requires the passage of the shaft through orifices of corresponding dimensions provided in successive decks, which weakens the construction of the decks or necessitates considerable local reinforcement. On the other hand, the rotation of the
30 hoist involves a displacement of the base of the said hoist for supplying it with ammunition, which represents a complication of the operation and handling.

35 It has likewise been proposed to divide the hoist into two elements, the lower element being fixed and opening at its upper portion into a chamber which forms a relay and is provided below the platform carrying the parallel gun
40 mountings. The ammunition received in the said relay chamber is transferred to supplementary hoist elements, which are movable with the chamber and the gun mountings, and by means of which the ammunition is raised to the
45 desired level for being brought to the actual loading device. It is quite certain that this second method, while obviating the disadvantages of the swivelling shaft device referred to hereinbefore, comprises other disadvantages, which
50 reside, on the one hand, in the space required by the relay chamber and, on the other, in the inevitable means required for transferring the charge from the fixed lower hoist to the supplementary upper hoists which are movable with the
55 relay chamber and the gun carriages.

The object of the present invention is a device which enables all the disadvantages briefly enumerated hereinbefore of the means at present known to be eliminated. The invention is characterized in principle by the combination of
5 a fixed hoist, extending to within the immediate vicinity of the platform carrying the parallel gun mountings, with a receiving member adapted to be swivelled in direction about a vertical axis and at the same time adapted to pivot about an
10 axis parallel to the axis of the trunnions of the cradles, the said member being preferably installed between the two guns in such a manner that, in the position for receiving ammunition,
15 on leaving the fixed hoist, the said ammunition may be placed directly in the sockets with which the said member is provided for receiving the said ammunition.

In a practical construction, described by way of example only, the invention also comprises a
20 particular arrangement of the elements of the loading apparatus intended to receive in a simple, rapid and convenient manner the ammunition coming from the particular receiving member which is the main object of the invention.
25

This form of construction of the invention is shown in the accompanying drawings as applied, by way of example, to a pair of guns which are adapted to be aimed simultaneously in direction and are installed in a light gun turret for vessels
30 of medium or small tonnage.

Figure 1 is a longitudinal sectional elevation of the whole of the turret;

Figure 2 is a cross-section through the axis of rotation of the turret;

Figure 3 is a plan view corresponding to Figure 1;

Figure 4 is a rear view, the portion on the left of the axis showing a half-section along the line IV—IV of Figure 1, and the portion on the
40 right of the said axis showing a half-section along the line IVa—IVa of the same figure.

Figures 5, 6 and 7 show in detail on a larger scale the apparatus for receiving ammunition at the top of the fixed hoist, the said apparatus being
45 installed in the centre of the turret.

In Figures 1 to 4, at 1 are shown the guns mounted in known manner in the firing cradles 2. The said cradles rest, by means of their trunnions 3; on mountings or cradle supports 4.
50

To the cradle of each of the guns are fixed in known manner, in addition to the normal firing members, two longitudinal members 5 which at the rear support the loading devices. For the application of the invention, there is provided for each
55

of the guns an ammunition receiving tray 6 arranged on the side of the gun towards the interior, a tray 7 for receiving the empty cartridge case arranged on the side, on the exterior, and
 5 guides 8 for a comb-shaped tray 9, the latter being fixed to the rear of the gun and having its teeth engaging the guides 8 during the recoil of the gun. The tray 9 and the guides 8 constitute
 10 a continuous tray, the elements of which telescope with one another during the recoil of the gun, and which form a bridge for the introduction of the ammunition into the gun and for the ejection of the empty cartridge case.

At the rear, between the two trays or shelves 6 and 7 is provided a table 10, and a bracket 11 is fixed to the rear end of the gun. Preferably, as shown in Figures 1, 3 and 4, trays 6 and 7, guides 8 and table 10 are secured to or made integral with one another and are all supported by longitudinal members 5.

It has been assumed by way of example that each gun comprises a wedge breech block 12 shown open in Figure 3. A recess 13 provided in the breech end 14 of the gun, allows the cartridge
 25 which is transported from the tray 6 to pass to its rear position in line with the axis of the gun for loading, the table 10 and the bracket 11 forming a track for this transport, which is operated by any appropriate known means.

30 In the example shown, the cradle supports 4 are fixed on a rotatable platform 15, which is mounted on a fixed bearing 16 by means of a rolling and centering track.

For aiming in elevation, the two cradles 2 carrying the guns may be, for example, connected with
 35 a single aiming shaft 17 by suitable elevating racks, as shown best in Figure 2.

The platform 15 may support a shield 18 forming a firing chamber and an operating floor 19. The said floor comprises at the rear a hinged
 40 element 20, which is adapted to be closed flat and which may be uprighted to enable the loading attendant to descend to a lower floor 21 for convenience of operation when loading at high
 45 angles of elevation.

According to the characteristic essential feature of the invention, an ammunition receiving apparatus is arranged, along the vertical axis of
 50 rotation of the turret, between the two guns, opposite the mouth of the shaft of a fixed central hoist 22. The said hoist opens through an opening 23 provided in the centre of the platform 15.

The actual hoist may be of a known type with a reciprocating hoisting mechanism, as indicated
 55 in the drawings. It comprises two tubes 24, arranged side by side, in which the ammunition for both guns is raised simultaneously.

The receiving apparatus constituting the essential feature of the invention is shown in detail in
 60 Figures 5 to 7.

This apparatus comprises a pivoting stirrup-shaped frame 25 adapted to pivot about its vertical geometric axis, which is at the same time the axis common to the turret and to the central hoist.
 65 The centering of the said swivelling frame or stirrup is ensured at the base by a ball-bearing 26, or by any other equivalent device, and in the upper portion by a pivot 27 engaging a fixed support 28, which, for example, may be fixed to the cradle supports 4 of the turret. As shown, one of the races of the bearing 26 is carried by frame 25, the other race being mounted on platform 15. The cartridge receiving sockets may be formed
 70 in a common rocking ammunition carrier, constituted by two tubes 29 (Figures 2 and 6), connected

and braced together by two mountings 30, 31, the first of which comprises two horizontal pivots 32 supported by the stirrup 25 in seats, preferably provided along the common axis of the trunnions 3 of the cradles 2.

On each tube of the rocking ammunition carrier are mounted two spring boxes 33 (Figure 5) arranged symmetrically, each comprising a spring 34 and a central rod 35 carrying a plunger 36 on its rear part. At their upper ends, the two
 10 rods 35 are connected together by a crosspiece 37 (Figures 5 and 6), the middle of which is adapted to form an abutment socket for the ogive of the projectile of the cartridge. In the lower part of each tube 29 is provided a pawl 38 adapted
 15 to be moved aside, rotatable about an axis 39 and constantly urged into the full line position *a* of Figure 7 by a torsion spring 40 (Figure 5).

The ammunition receiving apparatus in question may be operated by an attendant taking
 20 up a position in front between the two guns, on the floor 41 (Figure 1).

The arrangements described in the foregoing paragraphs render it possible to supply the two
 25 guns of the turret with ammunition under the following conditions:

For starting the actual hoist, the receiving apparatus 25 is swivelled in direction in such a manner that the tubes 29 of the rocking ammunition carrier, which are then placed vertically, are in line with the hoist tubes 24 of the fixed central hoist. The stirrup 25 is then locked to the fixed shaft 22. The hoist having been started, the ammunition at the end of the travel enters the tubes 29, moving aside the pawls 38, and abuts by
 30 the points of the projectiles against the crosspieces 37 of the draw-rods 35 of the spring boxes which, if the ammunition carrier is empty, are situated at the broken line position *c* of Figure 5, the springs 34 being extended. The ammunition,
 35 continuing its movement, raises the crosspieces 37, compressing the springs 34 until the said ammunition has completely entered the sockets of the ammunition carrier. The pawls 38 then engage underneath the ammunition, thereby
 40 causing the hoist to stop, for example due to the operation of a switch on the completion of the stroke.

The receiving apparatus being charged, it is then swivelled according to the actual position
 45 of the turret, so that the pivots 32 of the rocking ammunition carrier are brought into line with the trunnions of the gun cradles. When in this position, the stirrup 25 of the apparatus may be locked on the platform 15 by means of a locking device not shown. The carrier 29—29 is then
 50 turned until it meets the trays 6 carried by the cradles and arranged, for each gun, in line with one of the tubes 29 of the said carrier (see position *d* in Figure 5).

When the ammunition carrier meets the trays, the pawls 38 abut against the said trays, whereby the said pawls are moved aside (broken line position *b* in Figure 7). The ammunition, being
 55 no longer supported, is forced to the rear by the release of the spring devices, the power of which is predetermined to ensure the ammunition sliding until it abuts against appropriate stop pawls provided on the tray 6. This result is ensured
 60 even for the minimum angle of elevation of the guns.

The empty ammunition carrier 29—29 is then returned to the vertical position and swivelled in direction for receiving another charge coming
 65 from the fixed hoist.

The ammunition forced on to each of the trays 6 is rolled by the loading attendants, after removal of the empty case to the tray 7, onto the continuous tray formed by tray 9 and guides 8 and into line with the axis of the gun with a view to the introduction of the ammunition into the gun either by hand or by means of a mechanical ramming device of any known type.

As will be appreciated, the devices described render it possible to supply with ammunition the two guns of the turret in a continuous manner, whether the turret and the guns are immovable or in movement, and in any aiming position whatsoever, either in elevation or in direction.

Furthermore, the said devices necessitate the employment of only a very small gun crew in the turret for supplying the two guns with ammunition, namely, three attendants in all, one for the receiving apparatus and two for loading.

Although the constructional form of the particular ammunition receiving device installed between the guns and the outlet mouth of the shaft of the fixed hoist will preferably be given the form shown on the drawings and described hereinbefore, it is evident that modifications may be introduced in this form, without the said modifications departing from the scope of the invention. The primary feature of the invention, as stated hereinbefore, is to be seen in a swivelling receiving device, that is to say, a device movable in direction while being adapted to be brought into the desired position for receiving the cartridges directly on leaving the shaft of the fixed hoist. One of the simplest solutions is certainly that which has been shown and which comprises, in combination with an ammunition carrier having two sockets adapted to pivot in a swivelling frame, a second fixed frame in which the said swivelling may be effected.

Furthermore, the transfer of the cartridges from the ammunition carrier to the loading trays or other devices provided for receiving the said ammunition with a view to ramming it into the gun barrels may likewise vary. The simple means described and shown for this transfer should, however, be considered as forming part of the invention, as also the particular arrangement of the cradles with a view to the constitution of a continuous tray, for ramming the ammunition into the gun chambers.

What is claimed is:—

1. In ammunition supply apparatus for rotatable twin gun mounts, the combination of a fixed central hoist for delivering ammunition for both guns to a point between the guns, means for receiving and retaining the ammunition delivered by said hoist, a member in which said receiving means is pivoted for movement about a horizontal axis, a support for said member fixed with respect to said guns, and means for swivelly mounting said member in said support for movement about a vertical axis whereby said receiving means may be brought into alinement with said hoist regardless of the direction in which said guns are trained.

2. In ammunition supply apparatus for rotatable twin gun mounts, the combination of a fixed central hoist for delivering ammunition for both guns simultaneously to a point between the guns substantially at the center of rotation of the gun mount, means for receiving and retaining the ammunition delivered by said hoist, a member in which said receiving means is pivoted about a horizontal axis, a support for said member fixed with respect to said guns, and means for swivelly

mounting said member in said support for movement about an axis substantially co-linear with the axis of rotation of said gun mount whereby said receiving means may be brought into alinement with said hoist regardless of the direction in which said guns are trained.

3. In ammunition supply apparatus for rotatable twin gun mounts, the combination of a fixed central hoist for delivering ammunition for both guns to a point between the guns, means for receiving and retaining the ammunition delivered by said hoist, a member in which said receiving means is pivoted for movement about a horizontal axis, a support for said member fixed with respect to said guns, means for swivelly mounting said member in said support for movement about a vertical axis, whereby said receiving means may be brought into alinement with said hoist regardless of the direction in which said guns are trained, and means for removing said ammunition from said receiving means to a position from which it may be loaded into the guns after movement of said receiving means about its horizontal axis.

4. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver ammunition for both guns to a point central with respect to said guns, an ammunition receiving member adapted to receive the ammunition delivered by said main hoist and to hold the same while it is moved to a position in alinement with a portion of the loading apparatus, a frame in which said member is pivotally mounted for movement about an axis parallel to the axes of the trunnions of the guns, means fixed with respect to said guns for supporting said frame, and means for swivelly mounting said frame in said supporting means for movement about an axis substantially co-linear with the axis of said fixed main hoist, whereby said ammunition receiving member may be brought into alinement with said main hoist regardless of the direction in which said guns are trained.

5. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed substantially vertical main hoist adapted to deliver ammunition for both guns simultaneously to a point central with respect to said guns, the axis of said main hoist being substantially co-linear with the axis of rotation of said gun mount, an ammunition receiving member adapted to receive the ammunition delivered by said main hoist and to hold the same while it is moved to a position in alinement with a portion of the loading mechanism, a frame in which said member is pivotally mounted for movement about an axis parallel to the axes of the trunnions of the guns, means fixed with respect to said guns for supporting said frame, and means for swivelly mounting said frame in said supporting means for movement about an axis substantially co-linear with the axis of said fixed main hoist, whereby said ammunition receiving member may be brought into alinement with said main hoist regardless of the direction in which said guns are trained.

6. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member having a pair of tubular carriers adapted to receive and

retain the projectiles delivered by said main hoist, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, and a support for said

5 frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist.

7. In apparatus for supplying ammunition to

10 the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member

15 having a pair of tubular carriers adapted to receive and retain the projectiles delivered by said main hoist, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, a support for said

20 frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist, and tray means carried by said guns for receiving said projectiles from said carriers when the receiving member has been rotated about said horizontal axis into a position wherein the axes of said projectiles are substantially in alinement with

30 said tray means.

8. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member having a pair of tubular carriers adapted to receive and retain the projectiles delivered by said

40 main hoist, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, a support for said frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist, tray means carried by said guns for receiving said projectiles from said carriers, and means for transferring said projectiles from said carriers to said tray means when the receiving member has been rotated about said horizontal axis into a position wherein the axes of said projectiles are substantially in alinement with said tray means.

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9. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member having a pair of tubular carriers adapted to receive and retain the projectiles delivered by said main hoist, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, a support for said frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist, tray means carried by said guns for receiving said projectiles from said carriers, and spring pressed means engaging the noses of said projectiles for automatically transferring the latter from said carriers to said tray means when the receiving member has been rotated about said horizontal

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axis into a position wherein the axes of said projectiles are substantially in alinement with said tray means.

10. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member having a pair of tubular carriers adapted to receive the projectiles delivered by said main hoist, means for retaining said projectiles within said carriers, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, a support for said frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist, tray means carried by said guns for receiving said projectiles from said carriers, means for automatically releasing said retaining means when the receiving member has been rotated about said horizontal axis into a position where the axes of said projectiles are substantially in alinement with said tray means, and means for transferring said projectiles from said carriers to said tray means upon release of said retaining means.

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11. In apparatus for supplying ammunition to the guns of a rotatable twin gun mount, the combination of a fixed main hoist adapted to deliver a pair of projectiles simultaneously to a point between said guns, said hoist including a pair of vertical tubes through which said projectiles are raised, a projectile receiving member having a pair of tubular carriers adapted to receive the projectiles delivered by said main hoist, means for retaining said projectiles within said carriers, a frame in which said receiving member is pivotally mounted for movement about a substantially horizontal axis, a support for said frame fixed with respect to said gun mount, said frame being swivelly mounted in said support for rotation about a vertical axis central with respect to the tubes of said main hoist, tray means carried by said guns for receiving said projectiles from said carriers, means for automatically releasing said retaining means when the receiving member has been rotated about said horizontal axis into a position where the axes of said projectiles are substantially in alinement with said tray means, and means for transferring said projectiles from said carriers to said tray means upon release of said retaining means, said transfer means including a movable member mounted on said receiving member engaging the nose of each projectile and spring means associated with said movable member and adapted to be placed under compression upon delivery of the projectiles to said carriers.

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12. In apparatus for supplying ammunition to gun mounts of the type wherein a pair of guns are mounted on a common rotatable supporting platform, a fixed main hoist for delivering ammunition for both guns simultaneously to a point between the guns substantially at the level of said supporting platform, the axis of said hoist being substantially co-linear with the axis of rotation of said platform, a member rotatably mounted on said platform for movement about a vertical axis substantially co-linear with the axis of said main hoist, and an ammunition receiving carrier pivotally mounted in said member for movement about a substantially horizontal axis.

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13. In apparatus for supplying ammunition to gun mounts of the type wherein a pair of guns are mounted on a common rotatable supporting platform, a fixed main hoist for delivering ammunition for both guns simultaneously to a point between the guns substantially at the level of said supporting platform, the axis of said hoist being substantially co-linear with the axis of rotation of said platform, a stirrup shaped member rotatably mounted on said platform, a support for said member fixed with respect to said platform, a pivot for said member in said support located in line with the axis of said main hoist, the base of said member being substantially coaxial with said main hoist and having a bearing interposed between it and said supporting platform, and an ammunition receiving carrier pivotally mounted in said stirrup shaped member for movement about a substantially horizontal axis passing through the upwardly extending arms of said member.

14. In apparatus for supplying ammunition to a gun, a fixed hoist for raising a projectile to the level of the gun platform, a carrier into which the projectile is delivered by said hoist, a member mounted on said carrier and forming a stop for the retention of the projectile within the carrier after delivery thereto, means for pivotally mounting said carrier for movement about an axis substantially parallel to the axis of the trunnions of the gun, a tray carried by said gun and adapted to receive the projectile from said carrier when the latter has been rotated about its axis to a position in alinement with said tray, said tray, carrier and stop member being so constructed and arranged that movement of the carrier into alinement with said tray releases said stop member from retaining engagement with the projectile, and means mounted on said carrier for automatically ejecting the projectile therefrom onto said tray upon release of said stop means.

15. In apparatus for supplying ammunition to a gun, a fixed hoist for raising a projectile to the level of the gun platform, a carrier into which the projectile is delivered by said hoist, a member mounted on said carrier and forming a stop for the retention of the projectile within the carrier after delivery thereto, means for pivotally mounting said carrier for movement about an axis substantially parallel to the axis of the trunnions of the gun, a tray carried by said gun and adapted to receive the projectile from said carrier when the latter has been rotated about its axis to a position in alinement with said tray, said tray, carrier and stop member being so constructed and arranged that movement of the carrier into alinement with said tray releases said stop member from retaining engagement with the projectile, and means mounted on said carrier for automatically ejecting the projectile therefrom onto said tray upon release of said stop means comprising an abutment member slidably mounted on said carrier in position to be engaged and moved by the nose of the projectile upon delivery of the latter to the carrier and means yieldably urging said abutment member in a direction opposite to that in which it is moved by the nose of the projectile.

16. In apparatus for supplying ammunition to a gun, a fixed hoist for raising a projectile to the level of the gun platform, a carrier into which the projectile is delivered by said hoist, a member mounted on said carrier and forming a stop for the retention of the projectile within the carrier

after delivery thereto, means for pivotally mounting said carrier for movement about an axis substantially parallel to the axis of the trunnions of the gun, a tray carried by said gun and adapted to receive the projectile from said carrier when the latter has been rotated about its axis to a position in alinement with said tray, said tray, carrier and stop member being so constructed and arranged that movement of the carrier into alinement with said tray releases said stop member from retaining engagement with the projectile, and means mounted on said carrier for automatically ejecting the projectile therefrom onto said tray upon release of said stop means comprising a plunger member slidable longitudinally of said carrier, an abutment member carried by said plunger member in position to be engaged by the nose of the projectile upon delivery of the latter to the carrier, and spring means associated with said plunger member and adapted to be compressed when the nose of the projectile engages and moves said abutment member upon delivery to the carrier.

17. In apparatus for supplying ammunition to a gun, a fixed hoist for raising a projectile to the level of the gun platform, a carrier into which the projectile is delivered by said hoist, a stop member yieldably mounted on the lower end of said carrier in position to engage the bottom of the projectile and to retain the latter within the carrier after delivery thereto, means for pivotally mounting said carrier for movement about an axis substantially parallel to the axis of the trunnions of the gun, a tray carried by said gun and adapted to receive the projectile from said carrier when the latter has been rotated about its axis to a position in alinement with said tray, said tray being so constructed and arranged that upon movement of the carrier into alinement therewith it releases said stop member from retaining engagement with the projectile, an abutment member mounted on the upper end of said carrier in position to be engaged and moved upwardly by the nose of the projectile upon delivery thereof to the carrier, and spring means resisting and adapted to be compressed by said upward movement of said abutment member, release of said stop member permitting said spring means to expand and force the projectile from said carrier onto said tray.

18. In apparatus for supplying ammunition to a gun, a tray carried by the gun cradle in a position offset from the bore of the gun and adapted to receive ammunition to be loaded, a comb-shaped member carried by said cradle in a position laterally disposed with respect to said receiving tray and in line with the bore of said gun, and a complementary comb-shaped member carried by the rear end of the gun, the teeth of said comb-shaped members intermeshing and forming a continuous loading tray to which ammunition may be transferred from said receiving tray and from which it may be loaded into the gun.

19. In apparatus for supplying ammunition to a gun, a tray carried by the gun cradle in a position offset from the bore of the gun and adapted to receive ammunition to be loaded, a comb-shaped member carried by said cradle in a position laterally disposed with respect to said receiving tray and in line with the bore of said gun, a complementary comb-shaped member carried by the rear end of the gun, the teeth of said comb-shaped members intermeshing and forming a continuous loading tray, and means forming a table between said receiving tray and said contin-

uous loading tray across which the ammunition may be transferred into loading position.

20. In apparatus for supplying ammunition to a gun, a tray carried by the gun cradle in a position offset from the bore of the gun and adapted to receive ammunition to be loaded, a comb-shaped member carried by said cradle in a position laterally disposed with respect to said receiving tray and in line with the bore of said gun, a complementary comb-shaped member carried by the rear end of the gun, the teeth of said comb-

shaped members intermeshing and forming a continuous loading tray to which ammunition may be transferred from said receiving tray and from which it may be loaded into the gun, and an auxiliary tray carried by said cradle on the side of said first named comb-shaped member opposite to said receiving tray and adapted to receive the expended ammunition after ejection from the gun onto the continuous loading tray formed by said comb-shaped members.

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