

PUBLISHED

MAY 4, 1943.

BY A. P. C.

P. MAGNI ET AL
LOADING APPARATUS FOR RAPIDLY SUPPLYING
AIRCRAFTS WITH AMMUNITION
Filed June 14, 1940

Serial No.

340,618

4 Sheets-Sheet 1

Fig. 1

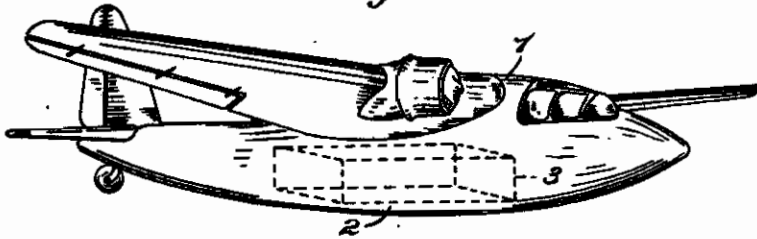


Fig. 2

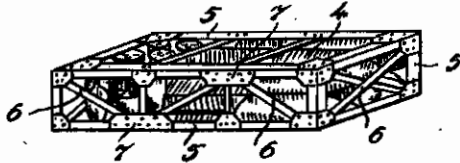


Fig. 6

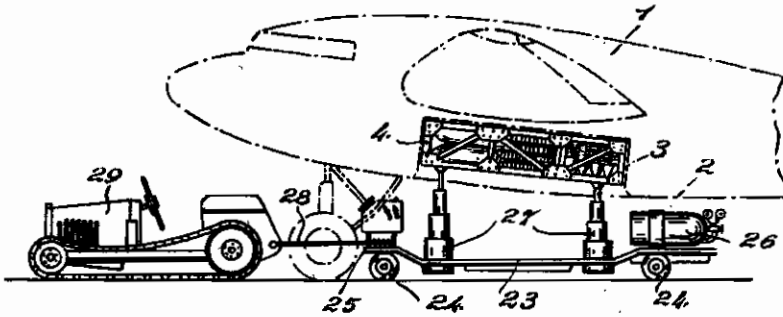


Fig. 7



Inventors,
P. Magni &
M. L. Tonalli

By *Glascock Downing Hubbell*
ATTYS.

PUBLISHED
MAY 4, 1943.

BY A. P. C.

P. MAGNI ET AL
LOADING APPARATUS FOR RAPIDLY SUPPLYING
AIRCRAFTS WITH AMMUNITION
Filed June 14, 1940

Serial No.
340,618

4 Sheets-Sheet 2

Fig. 3

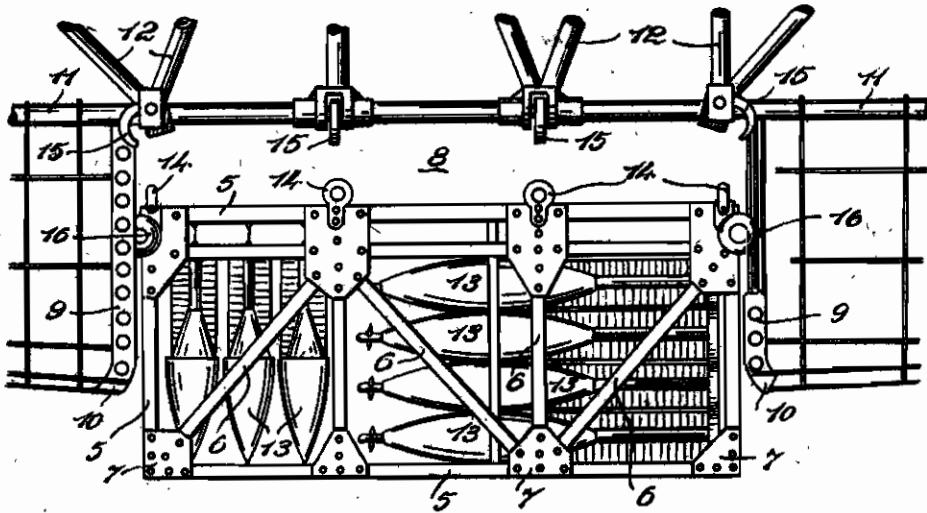
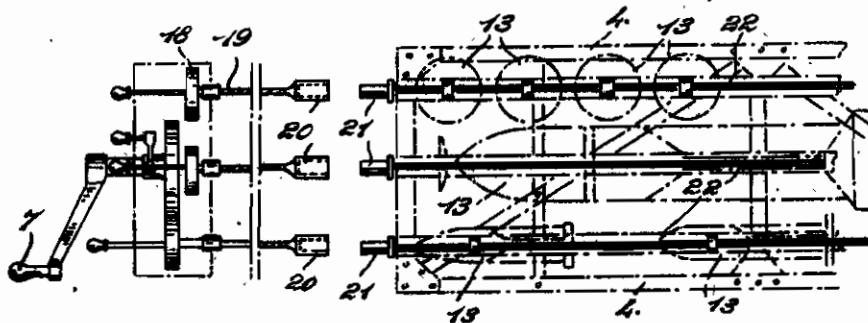


Fig. 4



Inventors
P. Magni &
M. L. Tonelli
by: *Glascok Downing & Sebold*
H.C.S.

PUBLISHED

MAY 4, 1943.

BY A. P. C.

P. MAGNI ET AL
LOADING APPARATUS FOR RAPIDLY SUPPLYING
AIRCRAFTS WITH AMMUNITION
Filed June 14, 1940

Serial No.

340,618

4 Sheets-Sheet 3

Fig. 8

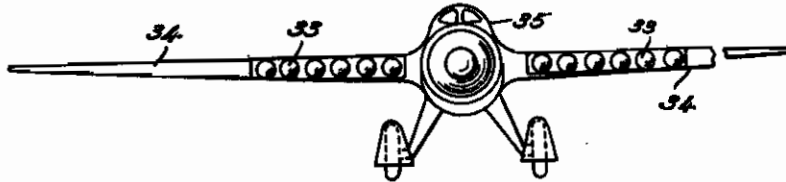


Fig. 5

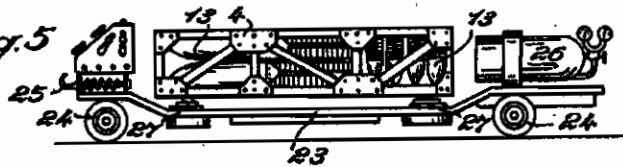
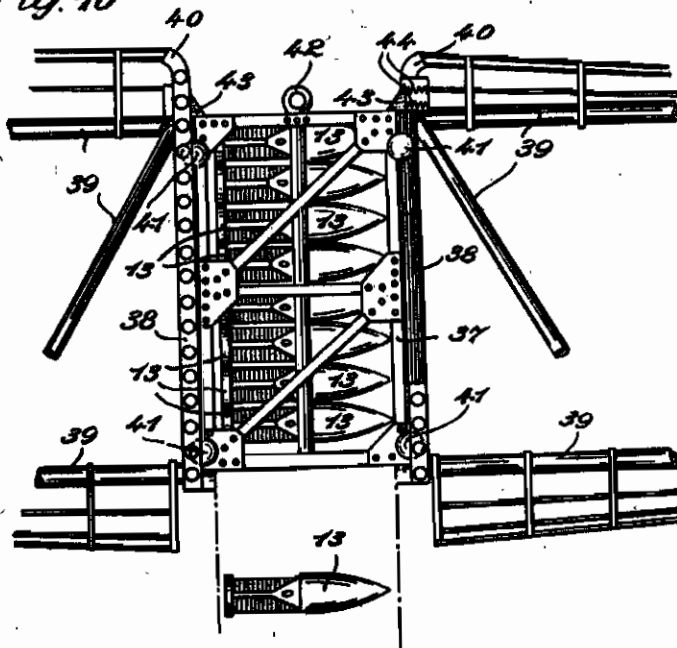


Fig. 10



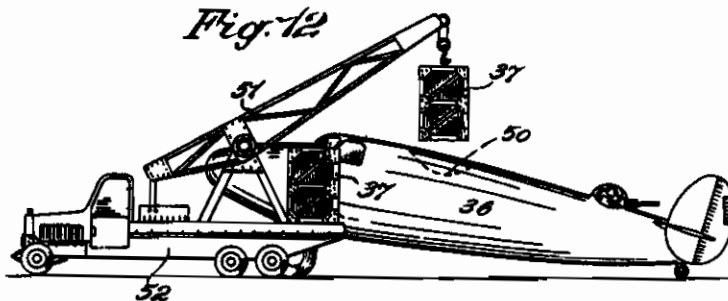
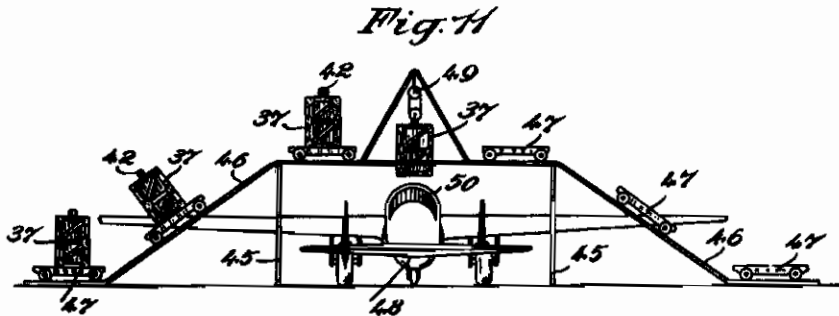
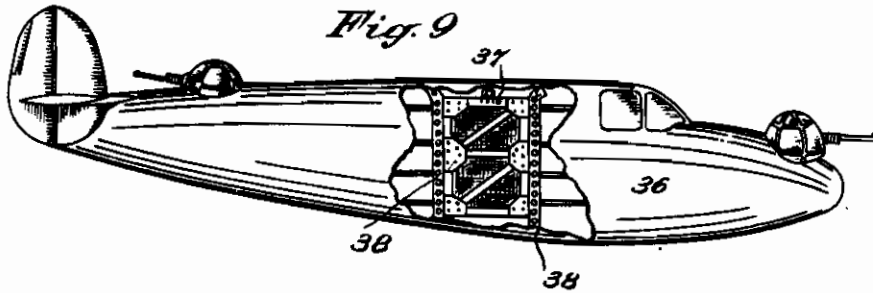
Inventors
P. Magni &
M. L. Tomelli
By: *Glascop, Downing & DeBell*

PUBLISHED
MAY 4, 1943.
BY A. P. C.

P. MAGNI ET AL
LOADING APPARATUS FOR RAPIDLY SUPPLYING
AIRCRAFTS WITH AMMUNITION
Filed June 14, 1940

Serial No.
340,618

4 Sheets-Sheet 4



Inventors
P. Magni &
m. L. Tonelli
by: Glascock, Downing, Sebald
1943.

ALIEN PROPERTY CUSTODIAN

LOADING APPARATUS FOR RAPIDLY SUPPLYING AIRCRAFTS WITH AMMUNITION

Piero Magni and Mario Leoniero Tonelli, Milan, Italy; vested in the Alien Property Custodian

Application filed June 14, 1940

The present invention relates to a loading apparatus for rapidly supplying aircrafts with ammunition.

The invention particularly refers to the loading system of projectiles, explosives, bombs aboard the aircrafts by means of a convenient loading tank or reservoir, in which the ammunition destined to the armament of the aircraft is conveniently arranged. The same system, besides serving for war ammunition may be equally used for dropping loads during the flight for instance mail bags, provision parcels, aerial freights to be packed and unshipped by means of a parachute and the like.

At present the ammunition especially of a large caliber is charged on each aircraft by piece and conveniently installed according to the type of aircraft. According to the invention on the contrary all the projectiles to be charged aboard are enclosed in said tank or reservoir to be conveniently adapted according to the type of aircraft both for lodging the projectiles of each single caliber and for the automatic mechanisms necessary for the launching.

Each loading or charging tank or reservoir may be fitted with bombs and stored in the ammunition premises of the airports, from where it is dragged on the field by means of a convenient carriage driven by an automatic tractor. Then by means of a simple manoeuvre it is inserted into the apparatus applied to the aircraft under the nacelle or under the wing or in another convenient part.

Said ammunition containing tanks or reservoirs are provided with special electric, pneumatic, mechanic controls or of any other type for the execution of launching manoeuvres as well for a single as for a simultaneous discharge. These controls are conveniently connected with the apparatuses for air manoeuvres.

The loading apparatus according to the invention may be applied to whatever type of aircraft, the coupling system being the same for all, though the inside of the apparatus may differ according to the calibre of the projectiles to be contained. The apparatus may be instantaneously applied to any civil or transport aircraft already predisposed for eventual war usage after settling the necessary connections; in this case an adapted disposition among the most convenient for the loading device may be at the bottom of the fuselage or of the aircraft.

Of course the apparatus according to the invention may be realised in different types ac-

ording to the type of aircraft it has to be applied to.

A further characteristic of the invention is the system for the transport of the loading tanks or reservoirs. To this object a carriage has been provided with the necessary elevating members allowing the coupling of the tanks at the right place of the aircraft. In the case the loading has to be effected from the top a bridge structure with rail is provided, on which the carriages with the loading tanks are dragged by means of a cableway system, provided with an elevator allowing the tanks to be taken off the carriages and loaded into the aircrafts which successively are disposed under such a structure.

Some forms of realisation are illustrated in the accompanying drawing in which:

Fig. 1 is a prospective view of a bomb dropping aeroplane with a loading room for the tanks or reservoirs according to the invention;

Fig. 2 is a prospective view of a loading tank or reservoir;

Fig. 3 shows particularly one of the systems by which the loading tank or reservoir according to the invention may be lodged into the aircraft;

Fig. 4 shows one of the control systems for the launching manoeuvre;

Fig. 5 shows the transport and elevating carriage in running position;

Fig. 6 shows the carriage of fig. 5 with the elevators in action;

Fig. 7 shows the application of the loading tank or reservoir according to the invention to a civil aircraft;

Fig. 8 shows the disposition of the tanks within the wings of a bomb dropping aeroplane;

Fig. 9 is a side view partially sectioned of a bomb dropping aeroplane predisposed for the back coupling of the tank to the aircraft;

Fig. 10 shows the detail of this back coupling;

Fig. 11 illustrates a rail bridge system for the rapid loading of bomb dropping aeroplanes;

Fig. 12 shows another back loading system by means of an automatic crane.

With reference to the drawing in Fig. 1 reference number 1 shows a bomb dropping aeroplane provided in the lower part 2 of the fuselage with a loading room 3 indicated in the figure with little dashes. In this room there is disposed the loading tank or reservoir according to the invention only illustrated by way of an example in Fig. 2. The receptacle 4 is entirely metallic and comprises the angle brackets 5 connected to each other by means of the diagonals 6 and plates 7. In the inside there are disposed the

bombs or other eventual load with the relative launching devices. Of course another arbitrary structure may be chosen instead of the above disclosed, realised, for instance, by means of tubes instead of angle brackets.

In the case the tank or reservoir according to invention is applied to the lower part of the aircraft a disposition according to the type illustrated by way of example in Fig. 3 may be chosen. The hollow space 8 shows the guide 9 with converging curve 10 connected to the longeron 11 sustained by tubular framework 12. The loading tank or reservoir, containing in this case a series of bombs 13 is slipped from below between the guides 9 and is provided to this purpose with rollers 16. The converging curves 10 serve to facilitate the operation. In the upper part there are disposed the eyelets 14 which at the stroke end engage the snap hooks 15 supporting the loading tank or reservoir in its bearing centre 8.

For the launching manoeuvre the disposition illustrated by way of an example in Fig. 4 may be preferred. Of course any other mechanic, hydraulic, pneumatic electric system whatever may it be might be equally chosen. In the form of realisation illustrated reference number 17 shows the control crank fixed inside the cabin of the aircraft near the place of the person charged with the launching. Said crank by means of a gear system 8 capable to be coupled separately or simultaneously transmits the rotary motion to the flexible transmissions 18, which during their whole path are meant to be settled in a stable way on the aircraft. Said flexible transmissions end with the couplings 20 corresponding to the couplings 21 of the loading tank or reservoir 4. Said couplings transmit the motion of the disengaging members 22 of the single bombs 13, thus completing the control.

In the case of the loading tank or reservoir according to the invention is to be applied to the lower part of the aircrafts, the carriage shown in 23, Fig. 5, may be chosen for the transport and elevation of the same tank. This carriage is provided with two couples of wheels 24, an attachment 25 for the tractor, a tank 26 for the compressed air necessary for actioning the elevators 27.

As shown in Fig. 6 said carriage may be dragged by means of the rod 28 of the tractor provided with endless track bands 29 as far as either the belly of the aircraft 1 and once reached the right position, the elevators 27 are operated on so that the tank or reservoir may take an inclination corresponding to the position assumed by the aircraft on the ground.

Fig. 7 shows a peculiar application of the invention in which a loading tank or reservoir 4 is applied to a civil passenger transport aircraft 30. As schematically illustrated said aeroplane may remain invariated in all its parts, the unique war characteristic comprising the application of a series of launching controls as those shown in

Fig. 4 and the disposition of attachments and guides 32 constituting the bearing centre for the tank.

Fig. 8 illustrates a further application of the invention comprising the mounting of two loading tanks or reservoirs 33 inside the wings 34 of a bomb dropping aeroplane 35 of a different type. Said tanks may be mounted instead inside of the wings under the lower surface of the wings, should this be necessary in some particular case.

The back coupling of the loading tank according to the invention is illustrated in Figures 9 and 10. In Fig. 9 the loading tank 37 is shown in its place inside the aircraft 38 between the guides 39.

As shown more detailed in Figure 10 the guides 39 are carried by the metallic frame 38 of the aeroplane and show the converging curves 40 with the object already pointed out at the beginning of the description. The loading tank 37 is in its turn provided with the rollers 41 gliding on the guides 39 and the elevating hook 42. In the upper part of the guides 39 there are predisposed the spring edges 43 serving to keep the tank in position when it has been arranged within the aeroplane. In the lower part of the figure there has been illustrated a bomb 13 in the instant of being dropped as soon as unhooked from the loading tank or reservoir.

Two different systems for tanks or reservoirs are indicated in the Figures 11 and 12. In the Figure 11 a bridge structure 45 supports a rail 46 on which there may be dragged by means of a chain cableway system the carriage 47 supporting each a tank or reservoir 37 already filled with bombs. As an aeroplane is little by little brought under the loading bridge 45 a crane or tackle elevator 48 raises a tank from the carriage by means of the hook 42 and lowers it down into the hollow space 5 of the aeroplane. The same loading bridge system may be adapted to the roof of an aircraft or to a real bridge of a large size under which the aeroplanes to be loaded may pass one after the other to receive each its own loading tank or reservoir.

In Fig. 12 the back loading is effected by means of a crane 51 mounted on the motor car 52 which may be also predisposed for the transport of a certain number of tanks or reservoirs 37. It is clearly seen, how the tank may be lowered down into the hollow space 50 of the aeroplane 38. The automatic crane may be also employed for any other flight work as elevation of motors, loading and unloading of motor vehicles and so on.

The present invention has been illustrated and described in sole preferred form of realisation but it is understood that constructive changes may be practically introduced therein within the gist and scope of the claims without surpassing the limits of protection of the present industrial patent.

PIERO MAGNI.
MARIO LEONIERO TONELLI.