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Hickerson et al.

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[45] Sept. 11, 1973

[54] MULTI-PURPOSE MUNITIONS CARRIER

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[51] Int. Cl. **F41h 7/02**

[58] Field of Search **89/36 H, 36 K, 36 L, 89/36 M, 37.5 A, 40 B, 40 C**

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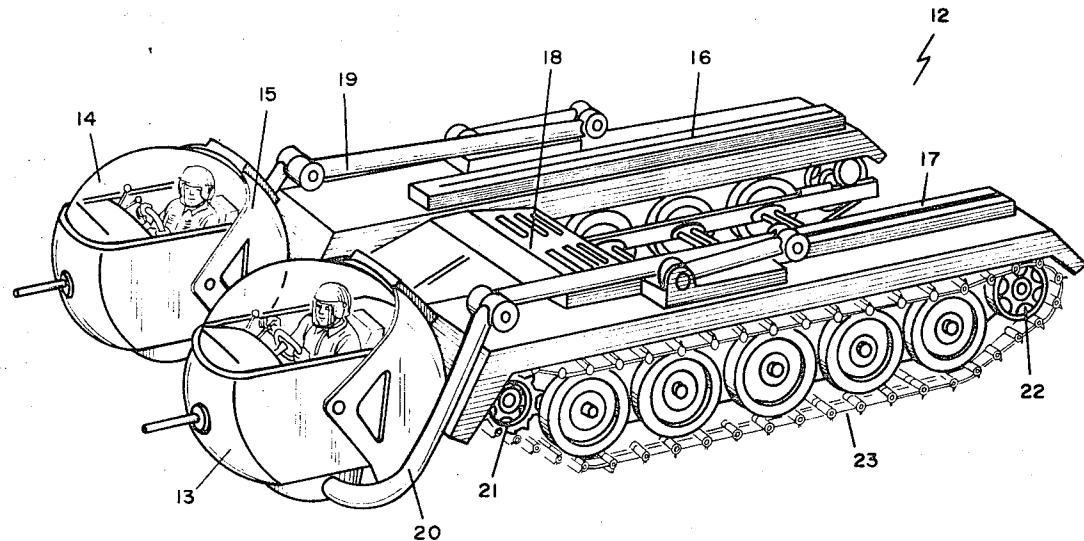
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[57]

ABSTRACT

A multipurpose munitions carrier comprising: a basic automotive tracked vehicle having extendable arms, a central recess, and a first attachment means along the sides and edges of said recess; an interchangeable central assembly, said assembly insertable into said central recess and having a second attachment means, said second attachment means complementary and firmly securable to said first attachment means; and detachable personnel capsules, each of said capsules rotatably attached individually to the end of said extendable arms of said tracked vehicle, and each capsule having independent control means whereby all functions of said multipurpose munitions carrier can be regulated by the operator of either capsule.

5 Claims, 10 Drawing Figures



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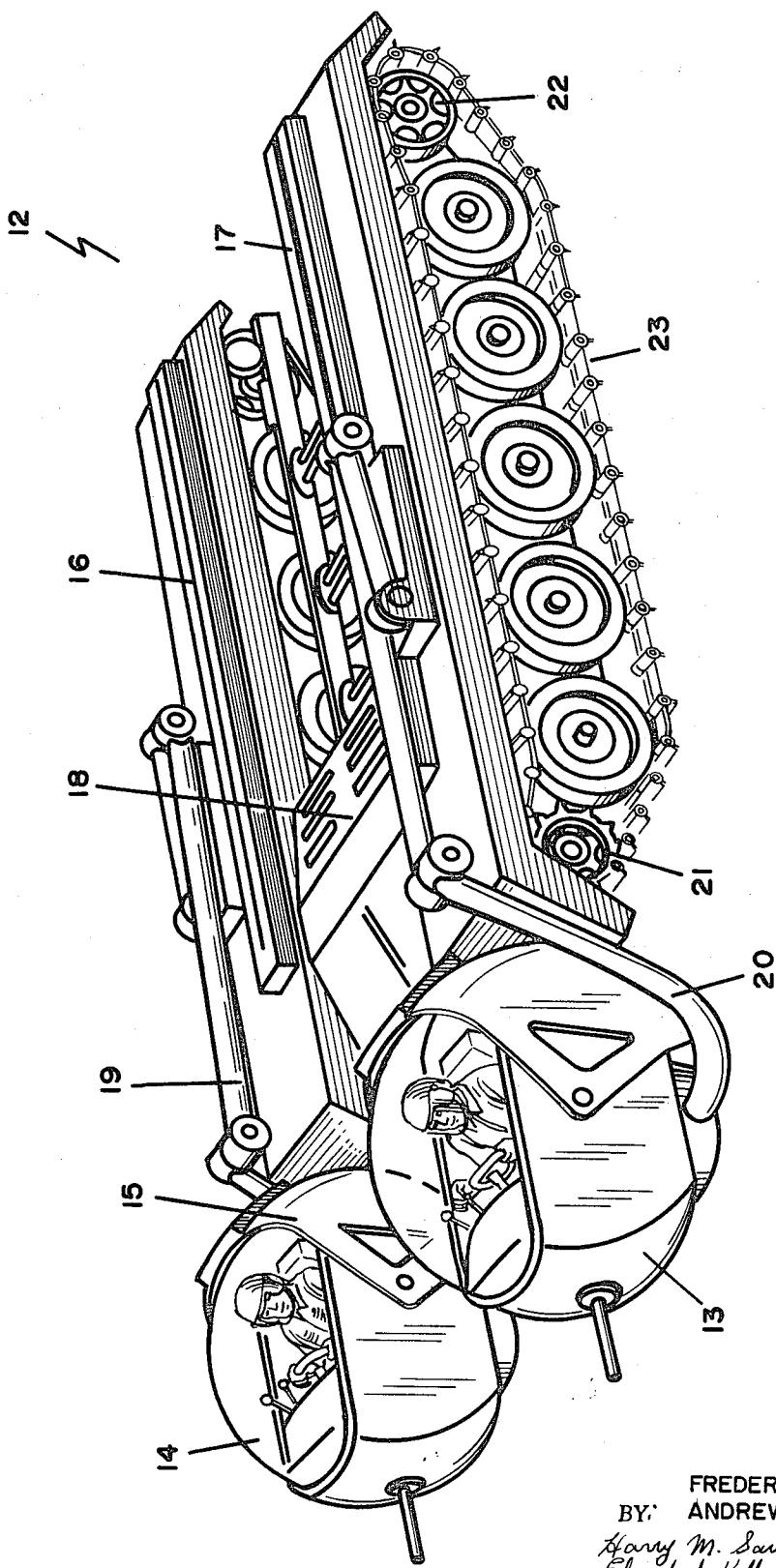


FIG. 1

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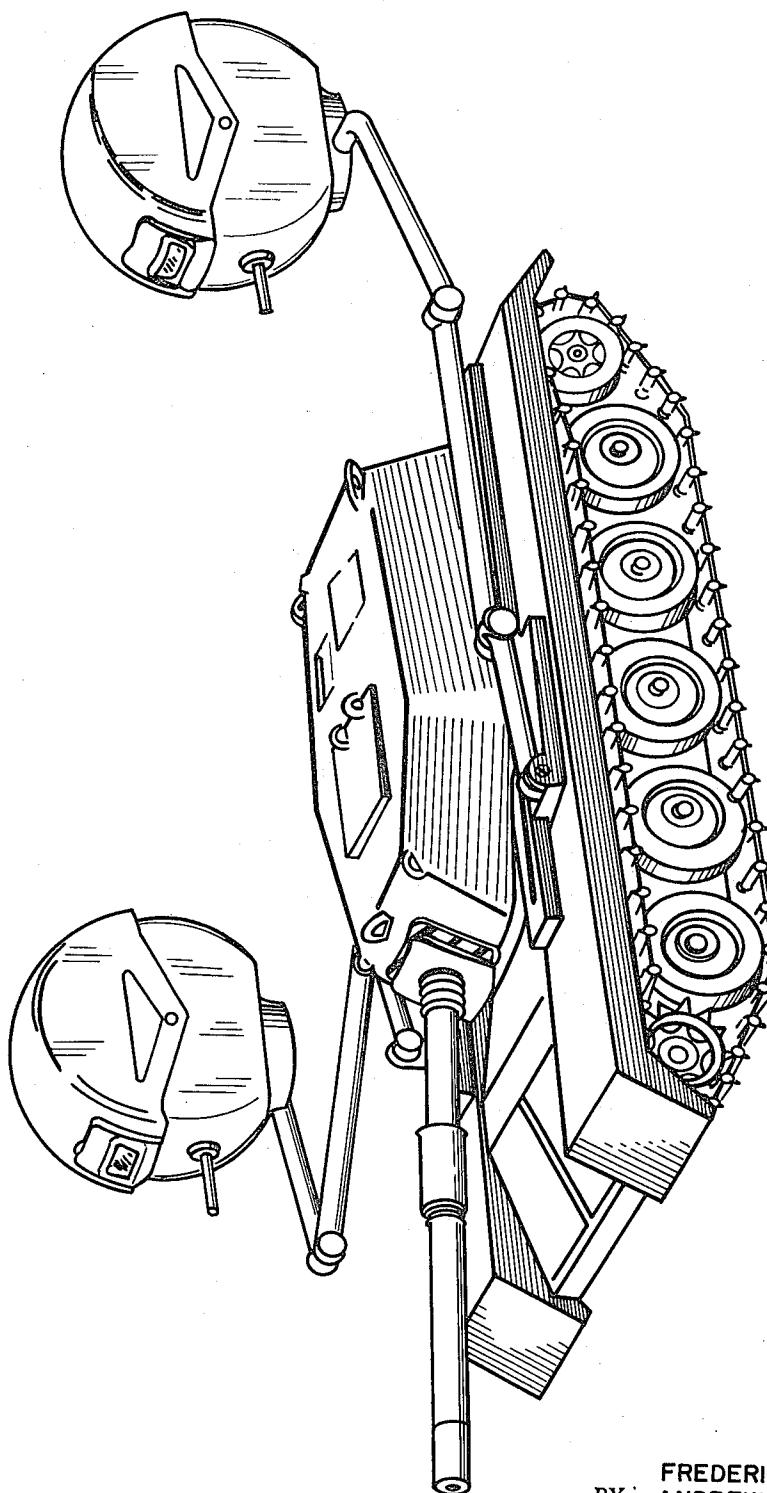


FIG. 2

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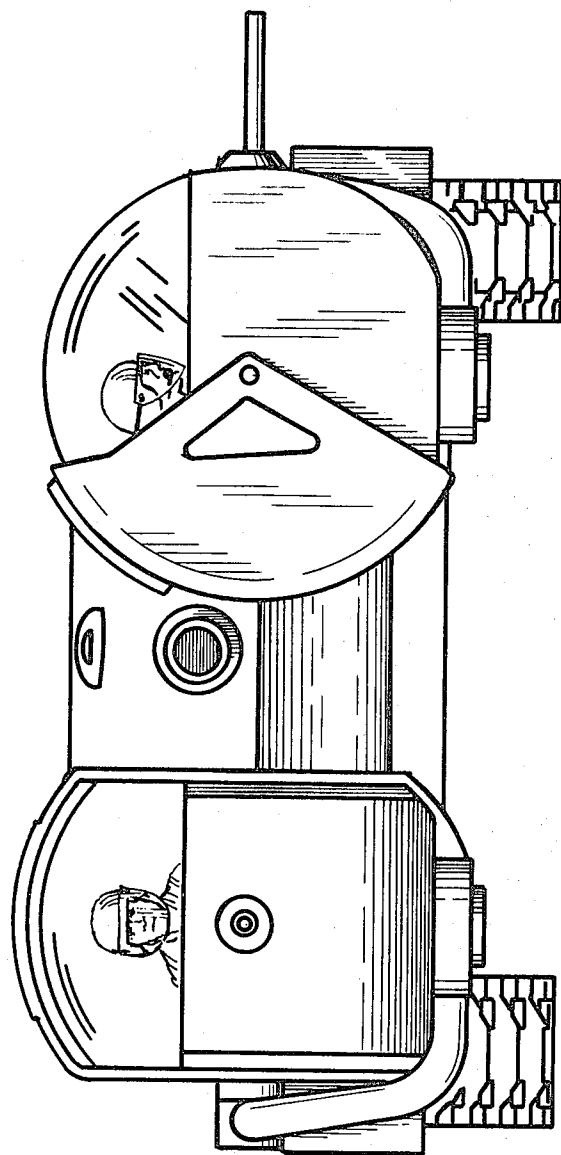


FIG. 3

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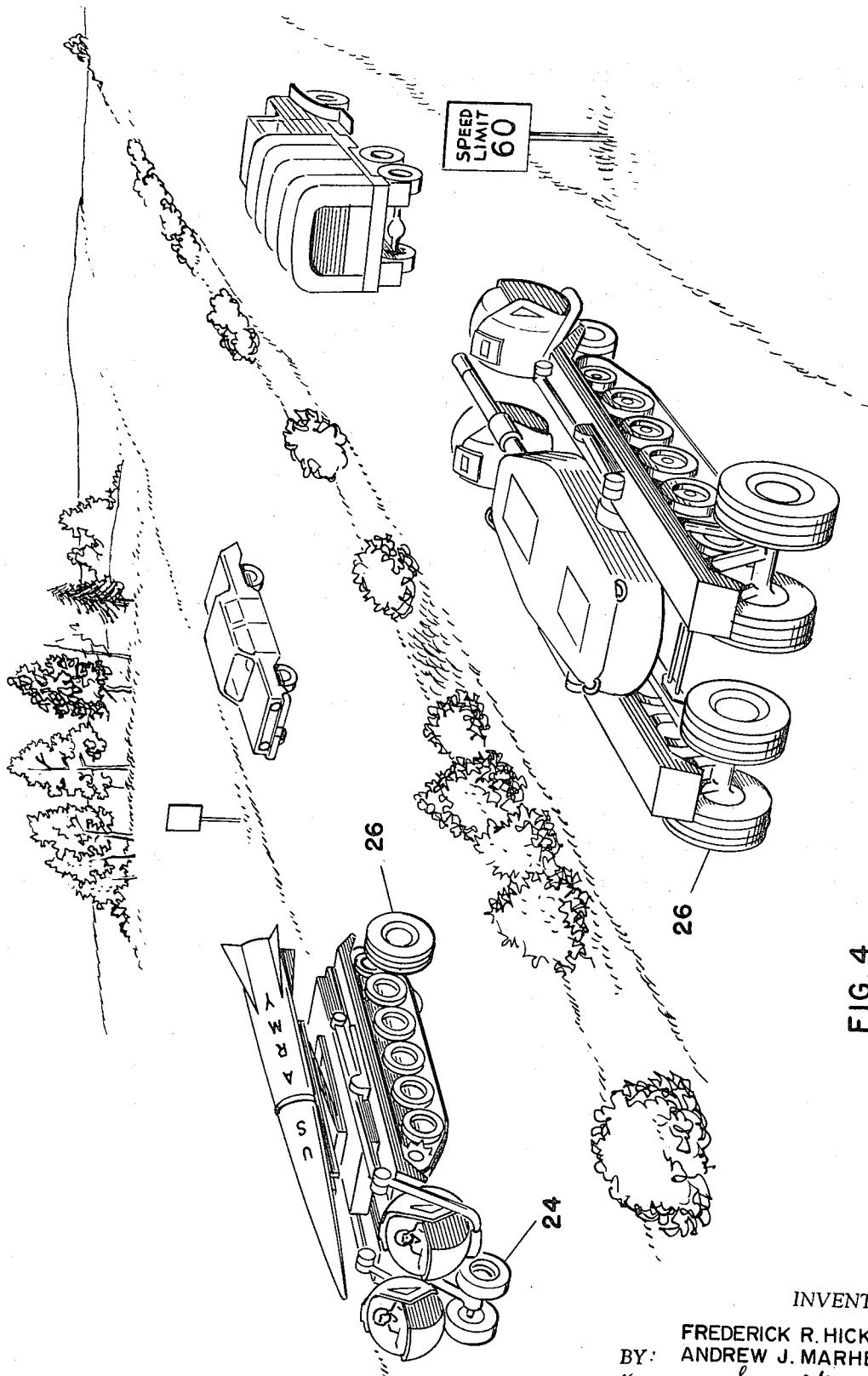
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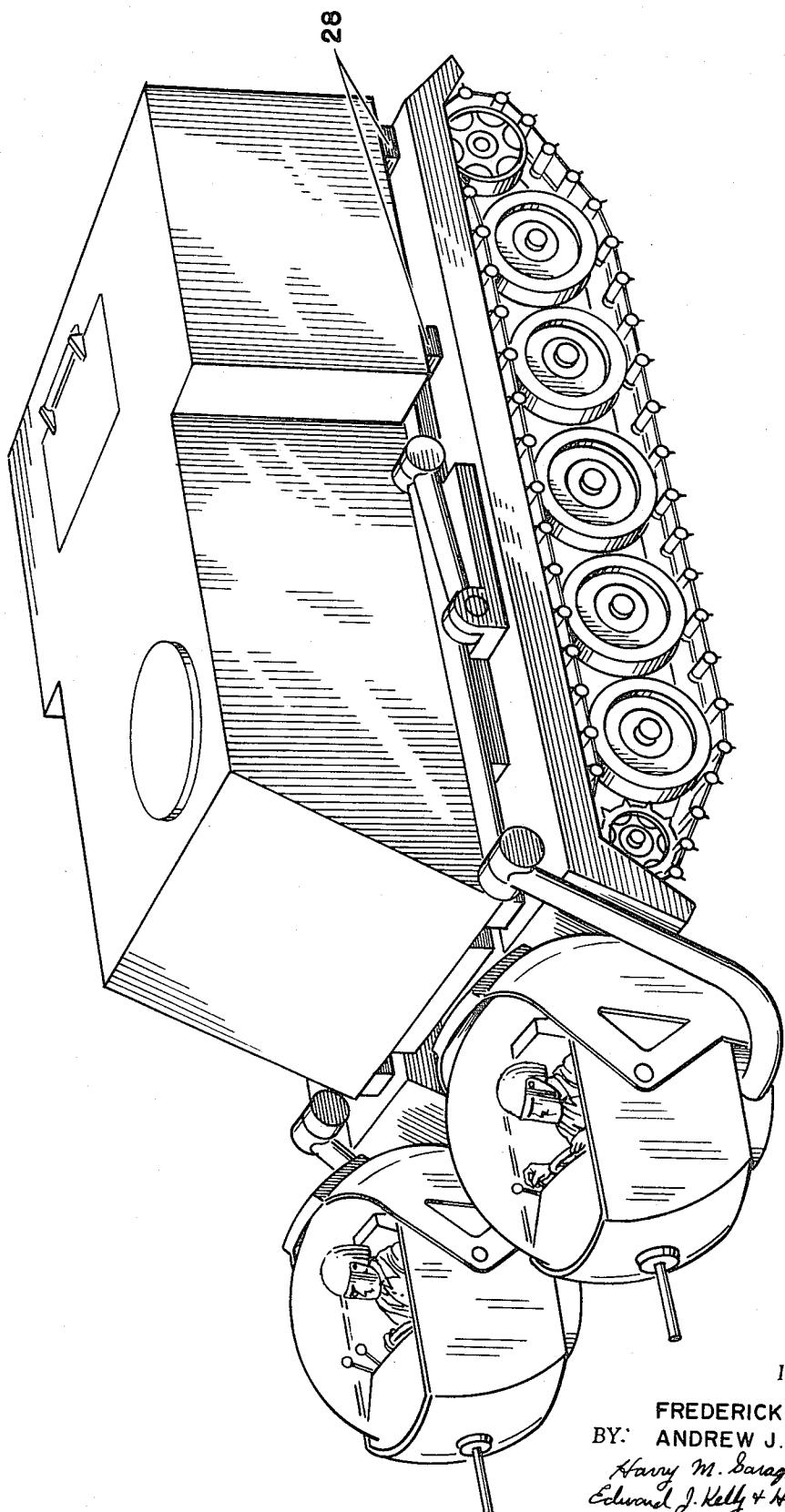
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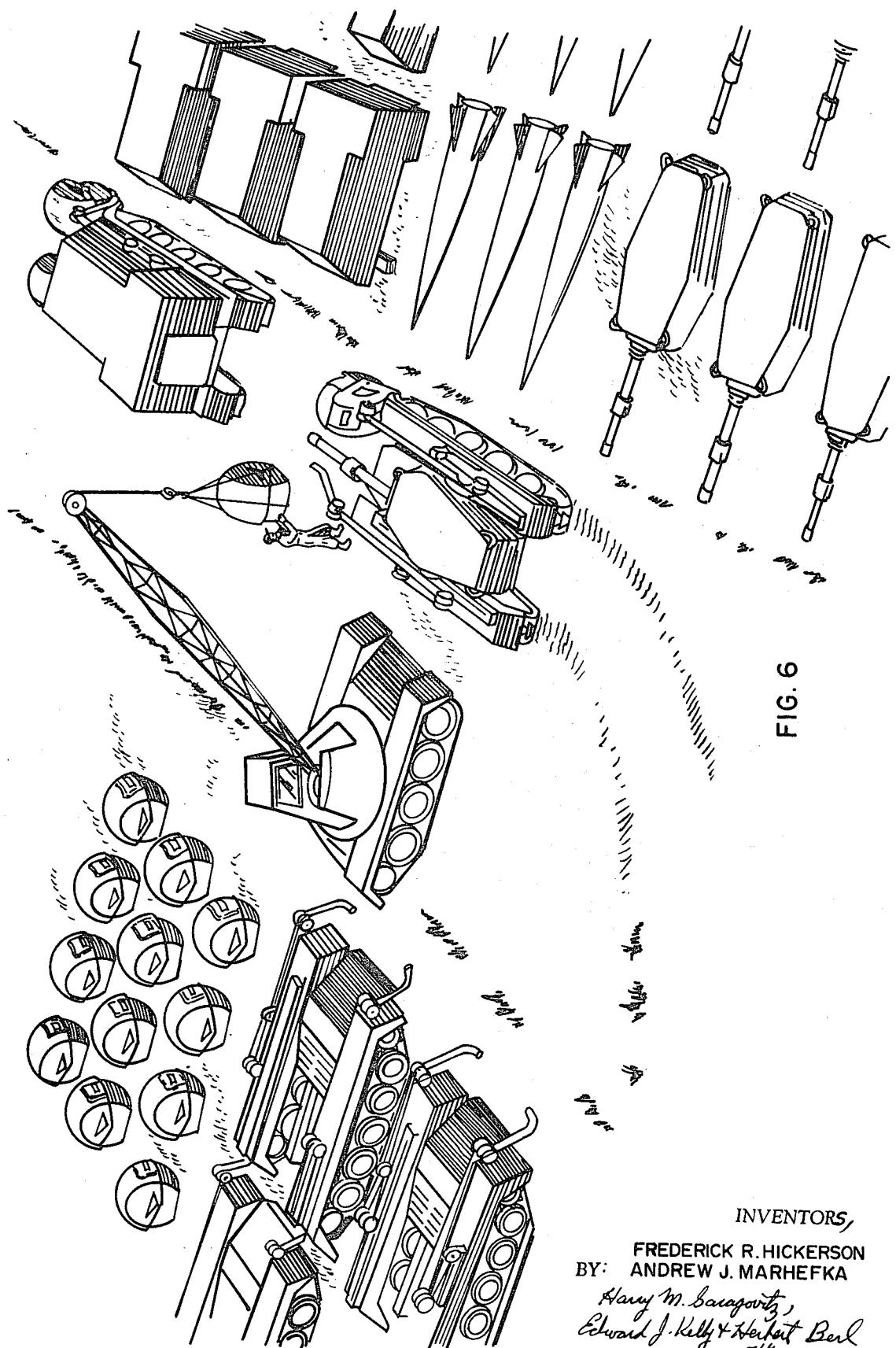


FIG. 6

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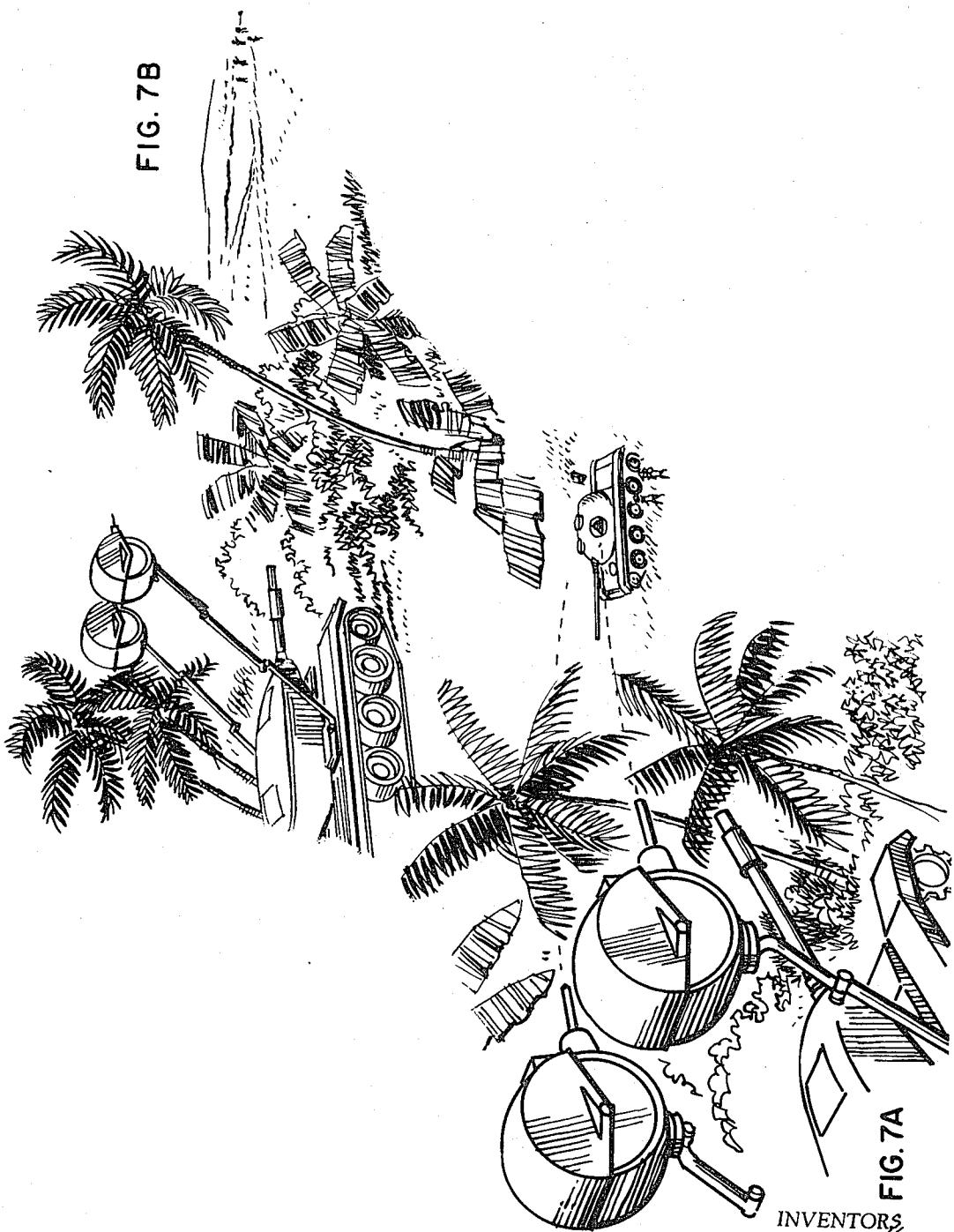
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FIG. 7B



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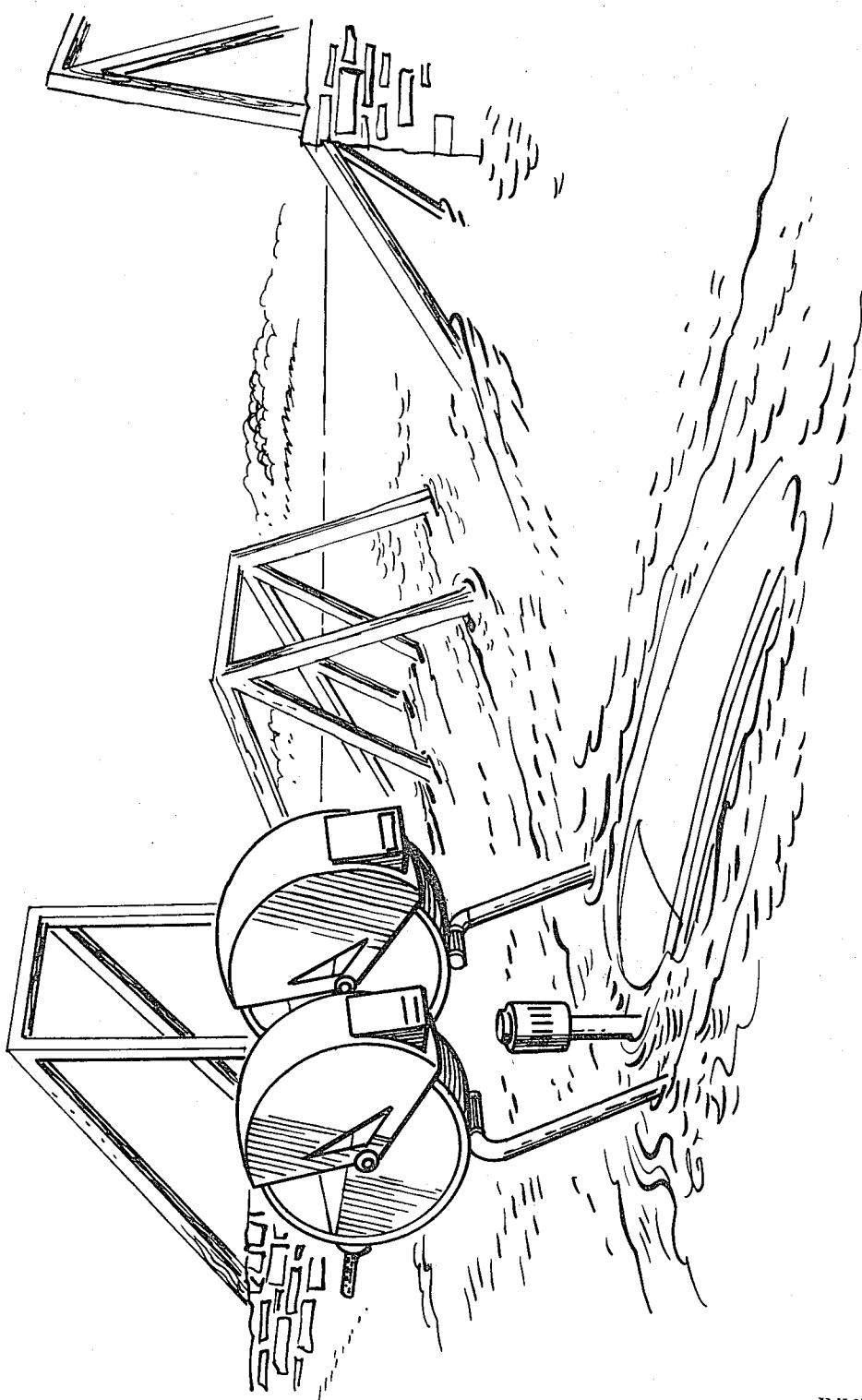


FIG. 8

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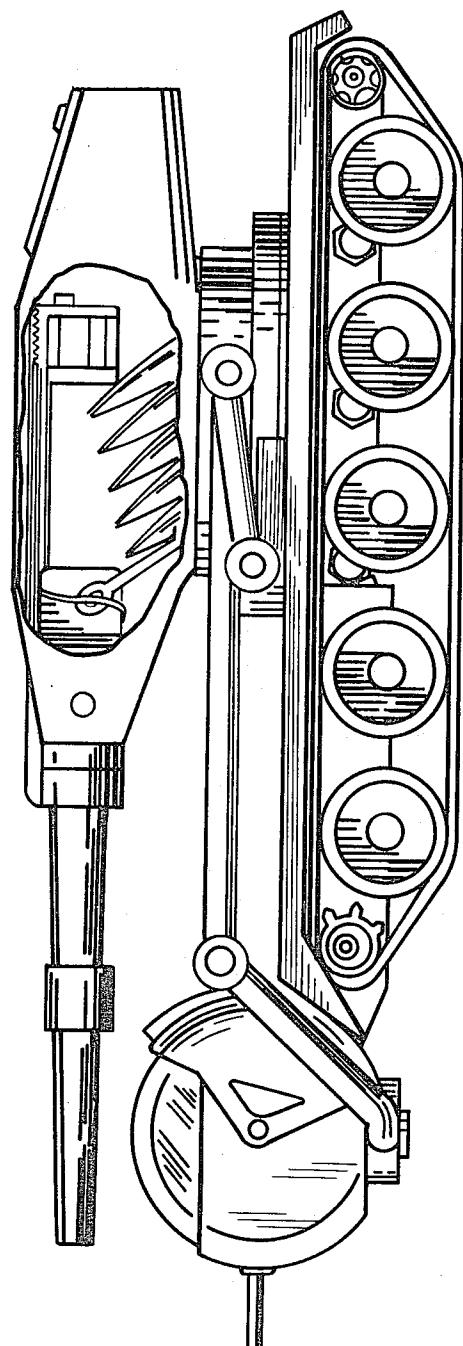


FIG. 9

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MULTI-PURPOSE MUNITIONS CARRIER

The invention described herein may be manufactured, used and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

BACKGROUND OF THE INVENTION

The tank, since its first appearance in military history, has always been in essence a sophisticated armored car. The armored car concept still prevails today, with most tanks requiring a complement of four operators, namely, the driver, the gunner, the loader and the commander. As the firepower of antitank weapons increased, the thickness and weight of tank armor required to protect these personnel was forced to increase accordingly. The result of this progression is a main battle tank (hereinafter referred to as the MBT) that weighs approximately 60 tons. This tremendous weight has done much to limit the mobility and transportability of the modern MBT.

It is to be further noted that all tanks have always been susceptible to being knocked out by a single hit. This weakness derives from the concentration of tank personnel in a single compartment.

The present invention, which surmounts the various weight and mobility problems in the prior art, represents a new concept in tank design. This concept dispenses entirely with the armored car concept of a tank. Instead, a carrier system comprising three distinct subsystems is substituted. These subsystems are (1) a basic tracked vehicle, (2) a weapons or payload system, and (3) personnel capsules. Each personnel capsule is equipped with a control system capable of operating the total system with the other capsule knocked out. Since the gun and the engine compartment represent rather small targets, it becomes, as a practical matter, nearly impossible to knock out the present carrier with one hit. The consequence of this fact is that massive armor is no longer needed. One to two inch armor will generally suffice. However localized armor may be placed on more vulnerable components of the carrier such as the fuel tanks and the personnel capsules. Due to such a reduced use of armor, it becomes possible to construct a tank-like vehicle of about 15 tons along theoretical lines that have not heretofore been explored.

SUMMARY OF THE INVENTION

An object of this invention is to provide a combat-type vehicle possessing increased mobility and effectiveness, and decreased weight and cost as compared with the conventional tank.

Another object is to provide a combat-type vehicle whose mission capability can be changed through a substitution of interchangeable subsystems.

A further object is to provide a tank-like vehicle which eliminates the conventional requirement of carrying all personnel within a central portion of the tank.

Another object is to provide a tank-like vehicle that can be operated by a single operator.

Yet another object of the present invention is to provide a tank-like vehicle that is light enough to be moved by a helicopter.

Another object is to provide a tank-like vehicle that will protect its operators from chemical and radiological hazards.

Still another object is to provide a vehicle whose con-

sumption of fuel is below that of a conventional tank.

The present invention comprises a basic automotive tracked vehicle having extendable arms, a central recess, and a first attachment means along the sides and edges of said recess; an interchangeable central assembly, said assembly insertable into said central recess and having a second attachment means, said second attachment means complementary and firmly securable to said first attachment means; and detachable personnel capsules, each of said capsules rotatably attached individually to the end of said extendable arms of said tracked vehicle, and each capsule having independent control means whereby all functions of said multipurpose munitions carrier can be regulated by the 10 operator of either capsule.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sketch of the basic tracked vehicle with personnel capsules.

20 FIG. 2 is a sketch of the Multi-Purpose Munitions Carrier (hereinafter referred to as the MMC) with a direct fire tank turret emplaced.

FIG. 3 is a front view of the MMC, illustrating its reduced frontal area as well as the rotating ability of the 25 capsules.

FIG. 4 is a sketch of the MMC traveling on a high-way.

FIG. 5 is a sketch of the MMC with an armored personnel carrier in place.

30 FIG. 6 is a sketch of an MMC assembly station.

FIG. 7A is a sketch of the MMC in combat.

FIG. 7B is a second sketch of the MMC in combat.

FIG. 8 is a sketch of the MMC fording a stream.

35 FIG. 9 is a side view of the MMC with an artillery type (indirect fire) turret emplaced and the personnel capsules in a position that will allow for a 360° rotation of the turret.

DETAILED DESCRIPTION OF THE INVENTION

40 The MMC comprises three basic subsystems, any of which can be readily replaced if it is damaged. The basic subsystems are: (1) a basic tracked vehicle possessing a tank chassis, (2) personnel capsules, and (3) interchangeable munitions assemblies. The interchangeable assemblies include a tank turret with an automatic loading capability, a personnel carrier, a fuel carrier, a command vehicle, a missile launcher, a flame thrower, a mortar carrier, an anti-aircraft weapons carrier, a supply carrier and a crane carrier.

50 FIG. 1 illustrates the basic tracked vehicle 12 with detachable personnel capsules 13. Each capsule has a plastic shield 14 underneath its steel cover 15. These capsules are each about five feet in diameter. Their weight can vary from 500 to 3,000 pounds each, depending on (1) the thickness of the armor used, and (2) the material of which the armor is composed. Usable materials include steel and hardened aluminum.

55 Each personnel capsule, it is to be emphasized, is totally equipped with an independent cable-operated control system. This feature is of great importance since the presence of two personnel compartments, each a command center unto itself, and each fully protected against chemical and radiological combat environments, strongly challenges the presuppositions upon which all tank design has been predicated. More specifically, by utilizing the present inventive concept, the tank designer no longer has to be obsessed with pro-

tecting a single large compartment, with the massive use of armor that such protection entails. Now, with the existence of two command centers in a single tank, much lighter armor on each will suffice, since a single hit will almost never be fatal to the entire MMC. In addition, once the feasibility of placing the tank operators outside of the tracked vehicle is recognized, a system possessing enormous flexibility and radically new battlefield capabilities becomes possible.

This flexibility is evidenced in the easy convertability of the present carrier to entirely different missions through the use of interchangeable central assemblies.

FIG. 1 illustrates a set of metal rails 16 and 17 which serve as basic supports for each of the interchangeable assemblies. The rails are so spaced and designed so as to constitute secure attachment means which interlock into other complementary attachment means on each of the insertable interchangeable assemblies.

An engine compartment 18 is provided with either a single or double engine. A double unit would provide a redundancy, thus enabling the MMC to operate with one engine shot out.

FIG. 1 also illustrates two multihinged arms 19 and 20, each of which carries at its end a personnel capsule which can rotate on the end of the arm to which it is connected. These arms, which can be suspended from either a front, central or rear point on the basic vehicle, possess a wide range of movement as is illustrated in FIGS. 1, 2, 7A, 7B, 8, and 9. The arms, which are detachable, could be powered by any of several systems. These systems could be hydraulic, pneumatic or mechanical. A hydraulic (or other) pump system for the arms would operate off the carrier's engine. Movement of the arms is controlled through extendable steel cables with appropriate pulley configurations in the joints. In addition, FIG. 1 illustrates a drive sprocket wheel 21 and a road wheel mount 22. The sprocket wheel 21 powers the entire track system 23.

FIG. 2 illustrates the MMC with a direct fire tank turret emplaced. Also, a personnel capsule with its armor shield emplaced is shown.

FIG. 3 illustrates the low frontal profile of the MMC.

A telescopic and retractable nose wheel 24, illustrated in FIG. 4, provides the vehicle with good maneuverability on roads. Braking is accomplished by the regular tank brakes. Road wheel mount 22 (see FIG. 1) provides a means by which rear wheels 26 can easily be attached or detached. FIG. 4 also illustrates an MMC equipped with a missile launcher.

The remote control operation of the personnel capsules is achieved through the use of heavy electrical wiring to the basic tracked vehicle and the interchangeable assemblies. In the tank turret embodiment, remote control is achieved through heavy wiring to an automatic gun loading system in the turret. Such an automatic loading system is within the state of the art as described in Volume 10 of Army Research and Development News Magazine (December, 1969).

FIG. 5 is a side view of the MMC equipped with an armored personnel carrier interchangeable assembly. Complementary attachment means 28 is shown in profile on said interchangeable assembly. It is to be understood that any set of firmly securable complementary attachment means will suffice in place of attachment means 16 and 28.

FIG. 6 illustrates an MMC assembly station. This station illustrates the flexibility of the MMC system. With

an assembly station fully stocked with all the MMC subsystems, a tank Force Commander can quickly alter or tailor the weapons configuration of his command. This adaptability can of course be invaluable under battle conditions where the make-up of the enemy force may not be fully known. In short, a much higher degree of contingency planning becomes possible.

Also, the invention allows undamaged parts of "knocked out" MMC's to be quickly reassembled into effective weapons. Hence, a great portion of the equipment put out of action in a battle could be put back into action by reassembling the salvageable parts from each knocked out MMC.

FIGS. 7A and 7B illustrate some further battlefield advantages of the MMC. The unique hiding ability of the personnel capsules is shown. Also, illustrated is the effectiveness of the elevated armored personnel capsules against distant snipers who could never otherwise be hit. The elevated capsules would also be invaluable in other terrains, such as a desert, where the horizon of the capsule operators would be more distant than that of an enemy.

FIG. 8 shows the stream fording capability of the MMC. Each interchangeable assembly is water-tight and provided with a snorkel system that would permit submergence for several hours. The technology for such an intake and exhaust snorkel system was established by the German Tiger Royal tank which was used in World War II.

FIG. 9 is a side view sketch of an MMC with the personnel capsules in a lowered front position that allows for a 360° rotation of an artillery type turret system. Said figure also illustrates a most important advantage of the MMC, namely, its low silhouette. This reduced profile makes the MMC hard to see and thus most difficult to hit. Also, the high mobility and hiding ability of the MMC render it a particularly elusive vehicle.

The light weight of the MMC is also a critical consideration in combatting future concepts of aerial implanted mines. Such mines, while immobilizing a conventional tank force, would, in the case of a 15 ton MMC, merely require a helicopter lift out of the mined area.

In addition, the cost of the MMC would be only about one-quarter that of the conventional MBT. Also, as aforementioned, only two rather than four operators are required. Actually, only one operator would be essential.

Finally, it must be noted that the MMC can carry guns the equivalent in size to any on a 60 ton MBT. The firepower of such guns might normally thrust the center of gravity of a comparatively light vehicle too far to the rear. This potential problem is met by the use of hydraulic spades which descend from the rear of the tank and dig into the ground, thus providing support for the MMC when it is firing its heavy guns.

It is thus seen that the objects set forth above are among those made apparent from, and efficiently attained by, the preceding description. It is believed that the present invention's attainment of these objects may be of tactical and strategic importance to the security of the United States and its allies.

We wish it to be understood that we do not desire to be limited to the exact detail of construction shown and described for obvious modification will occur to persons skilled in the art.

Having described our invention, what we claim as new, useful and non-obvious, and thus desire to secure by Letters Patent of the United States is:

1. A multipurpose munitions carrier comprising:
a basic automotive tracked vehicle having extendable 5
arms, a central recess, and a first attachment means
along the sides and edges of said recess;
an interchangeable central assembly, said assembly
insertable into said central recess and having a sec- 10
ond attachment means, said second attachment
means complementary and firmly securable to said
first attachment means; and
detachable personnel capsules, each of said capsules
rotatably attached individually to the end of said
extendable arms of said tracked vehicle, and each
capsule having independent control means
whereby all functions of said multipurpose muni- 15
tions carrier can be regulated by the operator of ei-
ther capsule, said capsules including;

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a plastic transparent shield covering each of said cap-
sules upper sections; and
a steel cover pivotally attached to said capsule sides
for covering said transparent shield when said mu-
nitions carrier is under battle-field conditions.

2. The munitions carrier in claim 1 wherein said in-
terchangeable central assembly comprises a tank turret
equipped with a remote electrical cable-controlled
shell loading system.

3. The munitions carrier in claim 1 wherein said in-
terchangeable central assembly comprises a personnel
carrier.

4. The munitions carrier in claim 1 wherein said in-
terchangeable central assembly comprises a missile
launcher.

5. The munitions carrier in claim 1 wherein said basic
automotive tracked vehicle possesses an armored tank
chassis.

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