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METHOD FOR RADAR DIRECTION OF MISSILES

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Fig. 1.

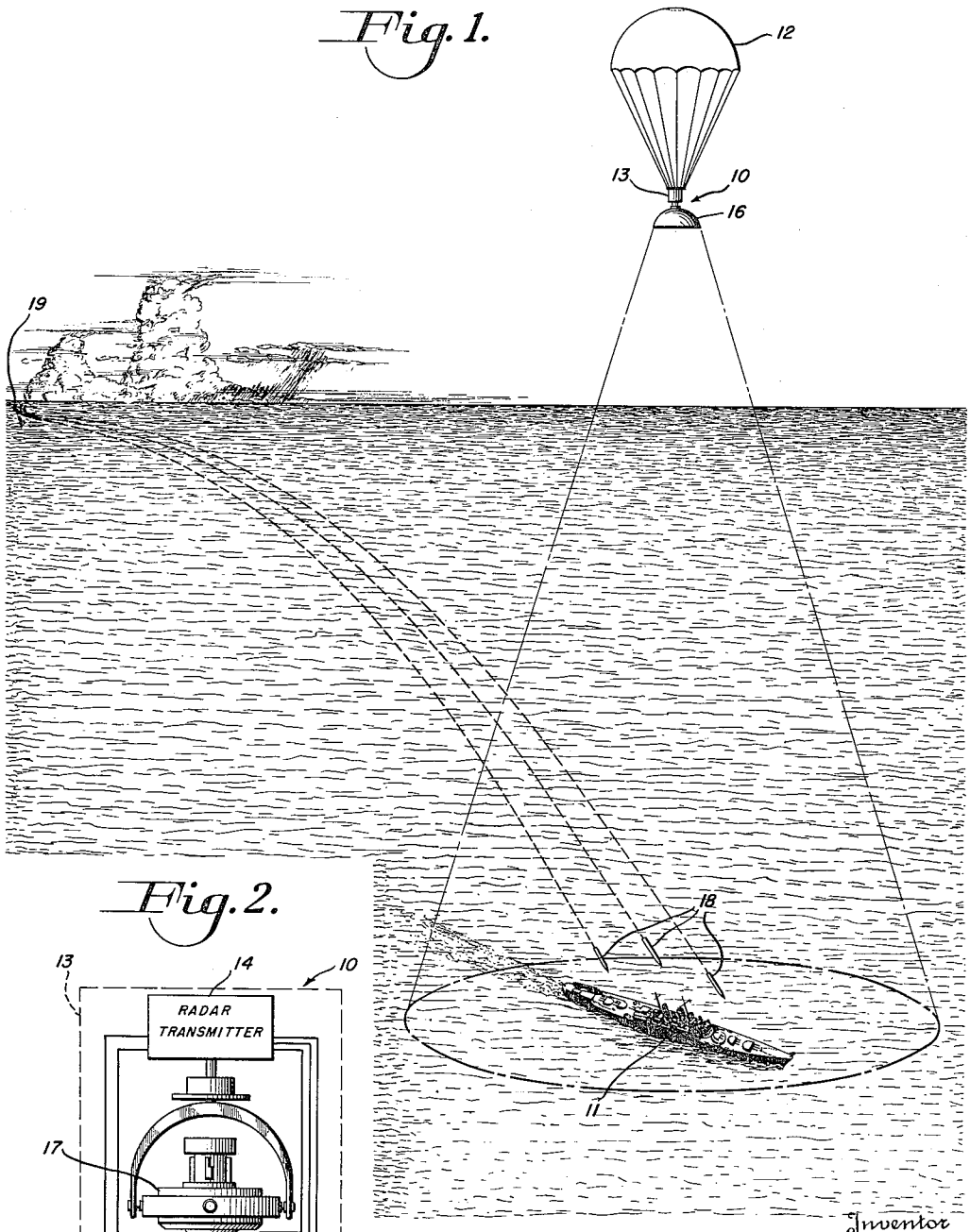


Fig. 2.

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METHOD FOR RADAR DIRECTION OF MISSILES

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The present invention relates to a method of radar direction of missiles and more particularly to a method of direction of missiles by a microwave transmitter placed in the vicinity of the target.

In prior art arrangements it has been the practice to mount a microwave transmitter in the missile to be guided thereby. In such arrangement the microwave transmitter must be built extremely rugged to withstand the great shock incurred during the firing of the missile.

In the present method the transmitter is carried by means of a rocket or the like into the vicinity of a target and released together with a parachute for supporting it over the target area, a gyroscope or other suitable means being employed to maintain the transmitted beam within the target area. Ruggedness, therefore, is not a necessary feature of the transmitter for the reason that a rocket is not subjected to great shock during the launching thereof. It is, therefore, possible in practicing the present invention to employ more delicate and more sensitive apparatus, and in the absence of a large explosive charge in the rocket space limitations will be avoided in arranging the apparatus in the rocket.

The present method is more economical in use than prior art arrangements in that only one microwave transmitter will be employed to direct a plurality of missiles. The present method is arranged in such a manner that jamming of the transmitted microwave signal may be avoided by launching a transmitter tuned to a certain frequency followed by a plurality of missiles tuned to the same frequency, and before the enemy is able to ascertain such frequency for the purpose of jamming the signal a second transmitter tuned to another frequency is launched followed by a second plurality of missiles tuned to the frequency of the second transmitter. Thus if the frequency is changed with every volley of missiles it will be difficult for the enemy to ascertain the frequency rapidly enough to interfere with the operation of the missiles.

An object of the present invention is to provide a new and improved method for microwave guidance of missiles in which a plurality of missiles are guided to a target by a single transmitter suspended over the target area.

Another object is to provide a method for microwave guidance of missiles wherein a transmitter is employed near the target area and separately suspended with respect to a plurality of missiles controllable thereby.

Still another object is to provide a method and apparatus for the transmission of a microwave beam in which tilting of a parachute supported transmitting antenna is prevented whereby the beam is projected into a target area.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

FIG. 1 is a view illustrating the method of the present invention; and

FIG. 2 is a diagram illustrating apparatus for use in the method of the present invention.

Referring more particularly to the drawings wherein like numerals of reference indicate like parts throughout the several views there is shown a microwave transmitter indicated generally at **10**, the purpose thereof being to impinge a target **11** with a radar beam for the guidance of microwave controlled missiles. The mechanism **10** is supported in the air by a parachute **12**. It is, of course, understood that the mechanism is transported to a position adjacent the target by means of a rocket or the like and released therefrom.

Upon release of the mechanism **10**, the parachute **12** opens and the mechanism begins a gradual descent during which time the target is impinged with the microwave beam.

The mechanism **10** comprises a casing **13** containing a microwave transmitting apparatus **14**. Supported at the lower end of casing **13** is a microwave antenna **15** having a directional reflector **16**. The transmitted beam of antenna **15** is maintained in a substantially constant, vertical direction and directed toward the target area by means of a gyroscope **17** operatively connected thereto in any well-known manner.

In carrying out the method of the present invention the mechanism **10** and the parachute **12** therefor are mounted in a rocket in any well-known manner, and carried thereby to a position in the vicinity of the target and released, the release being accomplished by any well-known means such, for example, as by a time delay fuse. Upon release thereof the mechanism **10** is suspended by the parachute **12** and the microwave transmitter **14** starts its operation. The gyroscope **17** maintains the beam directed toward the target area and prevents the antenna from influencing missiles fired at the target directly and causing the missiles to be directed toward the mechanism. The gyroscope **17** maintains the beam on the target area to influence microwave controlled missiles directed to the target by the reflection of the beam from the target.

As indicated in FIG. 1 the missiles **18** fired from vessel **19** are guided by microwave beam reflections from target **11**. The missiles **18** are equipped with a direction-finding receiver of any well known type suitable for the purpose, tuned to the frequency of the microwave signal emitted by transmitter **14** and reflected from the target **11**, which directs the flight of the missiles **18** to target **11**.

An important feature of the present arrangement is that a mechanism **10** may be released adjacent the target and thereafter project a certain frequency beam on the target **11** to guide a series of missiles to the target. A second mechanism **10** is launched a few seconds later tuned to project a beam of a different frequency and to guide a second series of missiles to the target. In this manner attempts of the enemy to jam a certain frequency to prevent microwave operation is effectively thwarted by reason of the rapidity with which the frequency of the microwave beam may be changed.

It is apparent that the arrangement of the present invention permits a greater amount of explosive charge to be mounted in the missiles employed therewith because of the absence of transmitting apparatus ordinarily contained therein.

It is also apparent that in the use of one transmitter for a group or salvo of missiles an appreciable saving in apparatus is made while, at the same time, the target is more effectively illuminated by reason of the proximity of the transmitter.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

The method of guiding a plurality of salvos of missiles toward a target area comprising the steps of discretely suspending a plurality of microwave transmitters in successive predetermined intervals of time above the target area, each transmitter projecting toward the target area a microwave beam of predetermined frequency, but of a frequency different from those of the other transmitters, during its respective predetermined interval of time, launching a salvo of microwave-controlled guided missiles toward the target area during each of said predetermined intervals of time, the missile-salvo of each predetermined interval of time being guided to the target area in response to substantially only the microwave frequency of the transmitter operating during its respective predetermined interval of time.

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