

Sept. 10, 1963

H. HIMMELBERGER
TALOS POSITIONING JIG

3,103,062

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4 Sheets-Sheet 1

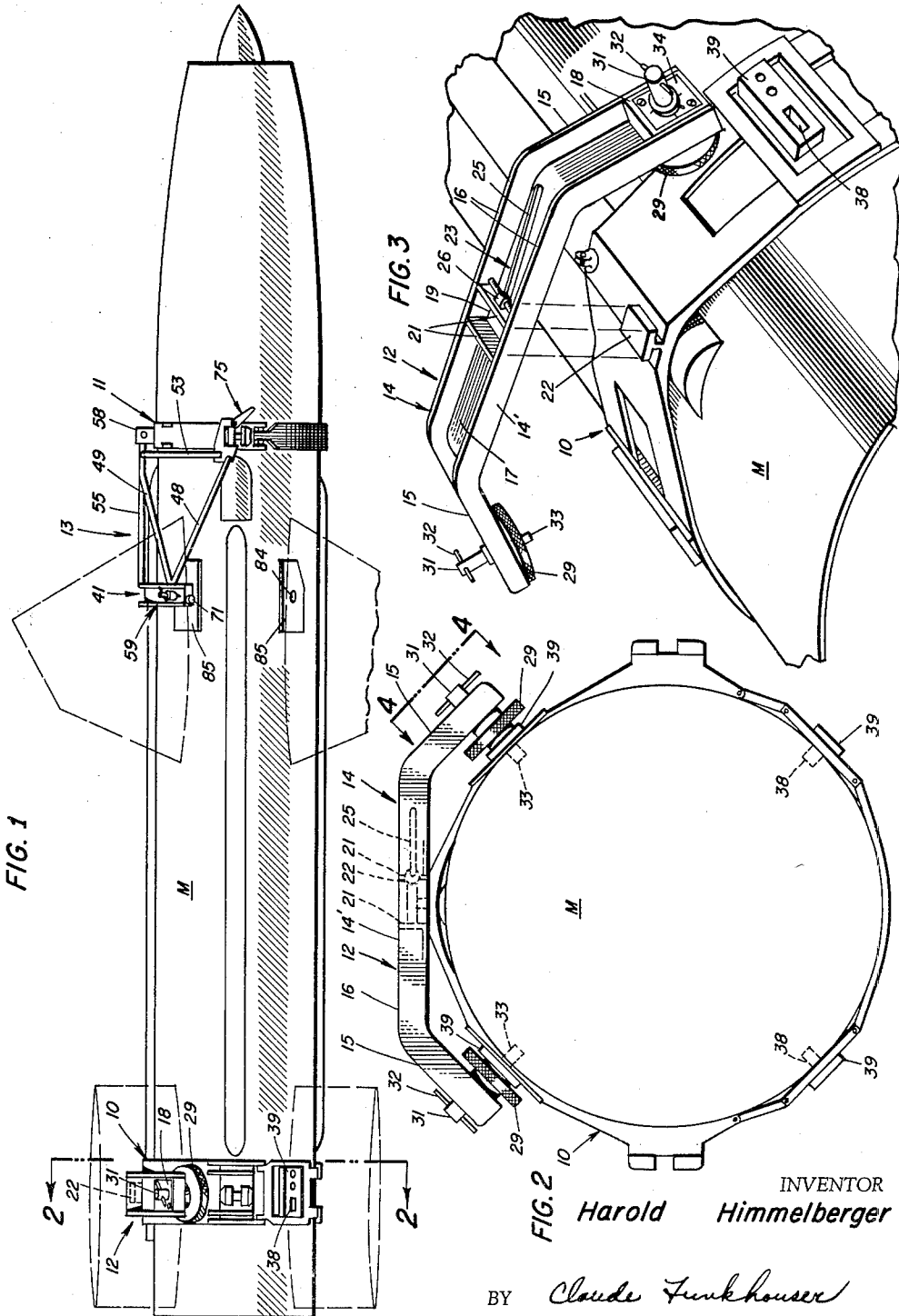


FIG. 1

FIG. 2

FIG. 3

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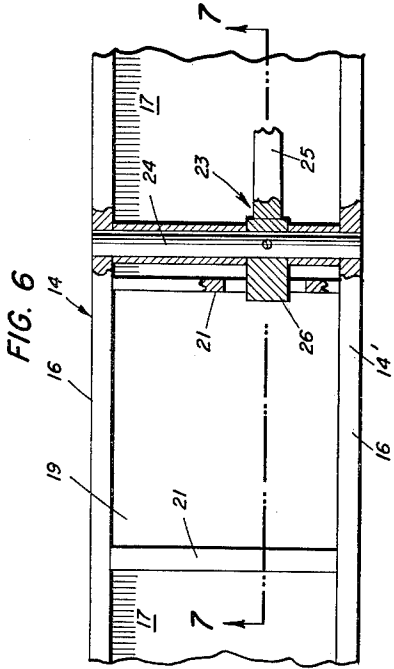


FIG. 6

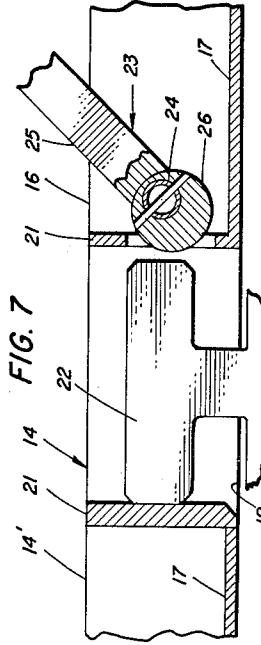


FIG. 7

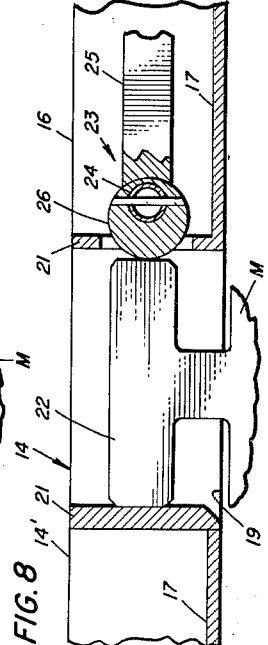


FIG. 8

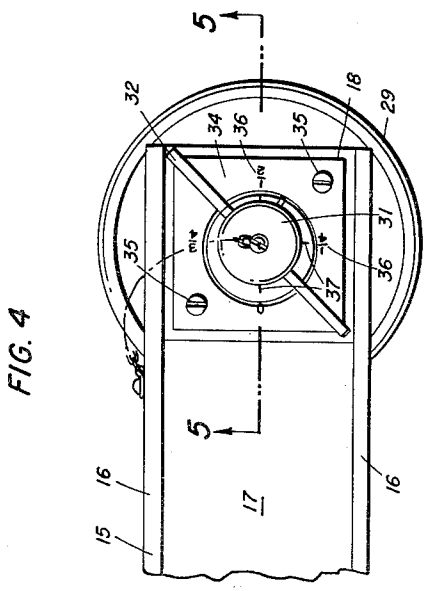


FIG. 4

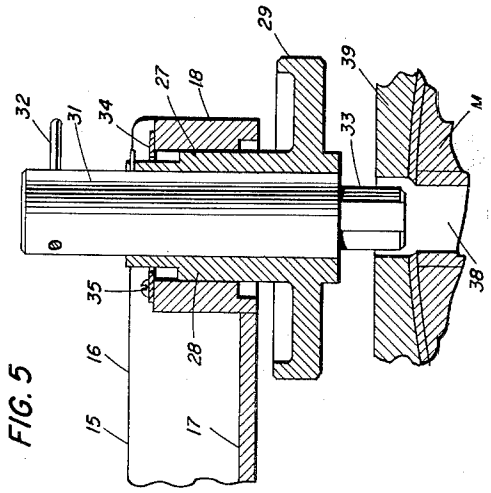


FIG. 5

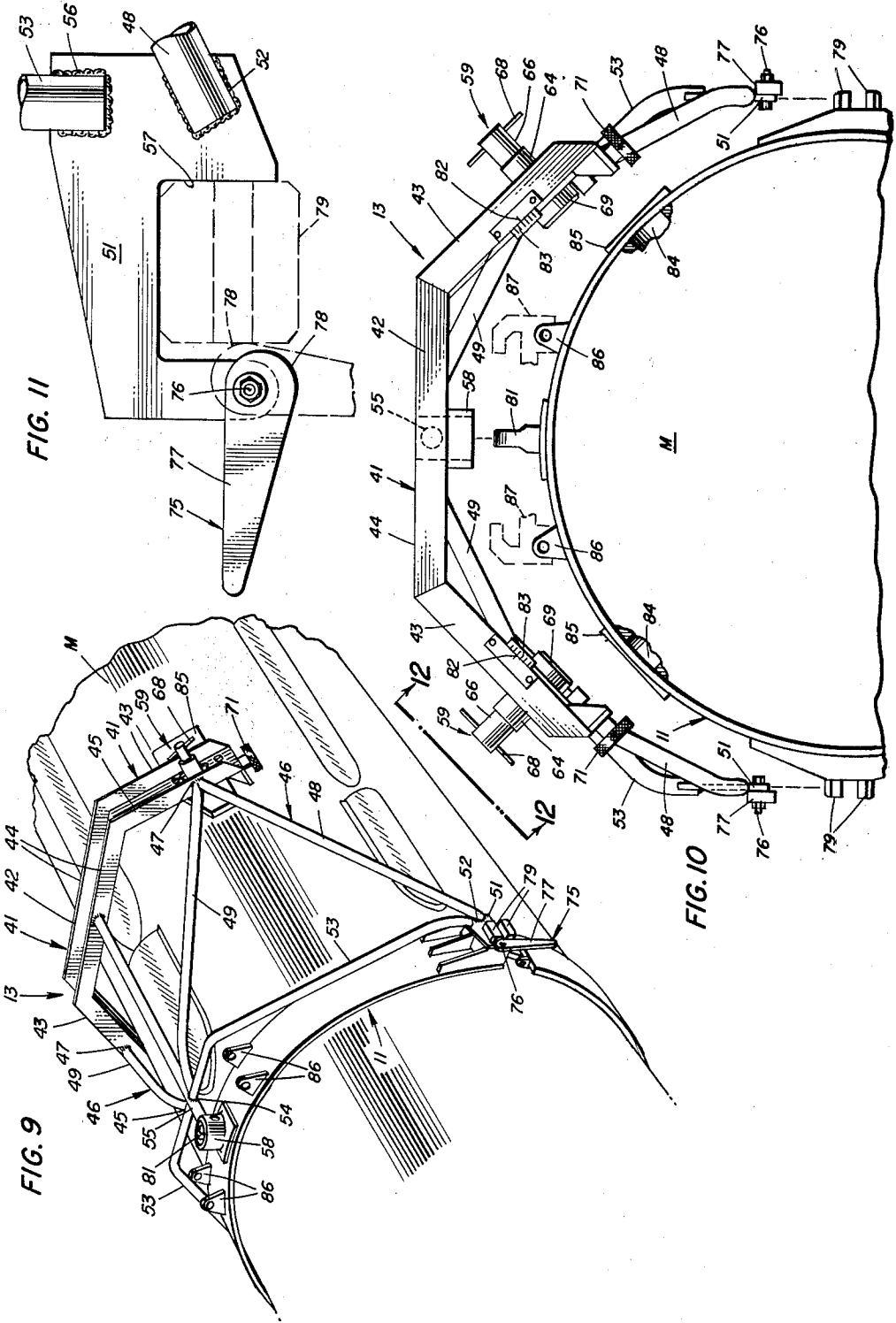
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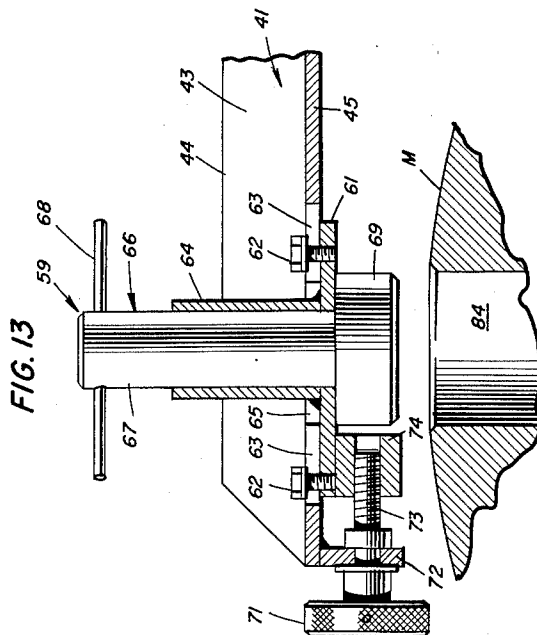
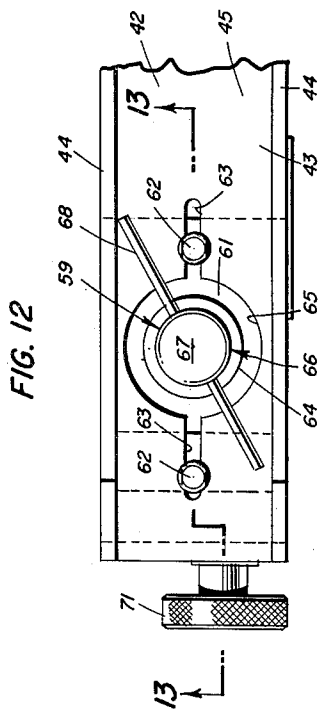
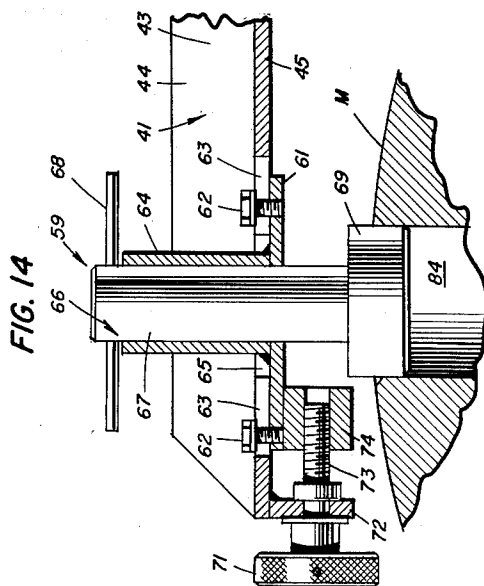
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3,103,062

TALOS POSITIONING JIG

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10 Claims. (Cl. 29—200)

This invention relates to a novel positioning jig for use in connection with handling bands employed on missiles and the like.

More especially, the invention relates to a device for aligning and correctly positioning forward and aft handling bands on a missile skin or casing. The positioning of bands on the missile in proper alignment is most essential since it contributes to overall utility and effectiveness of the missile transfer and stowage system for missiles from final checkout at the depot or station to struckdown aboard the combatant ship.

Heretofore, the aligning of the aforesaid bands was by visual estimation which proved to be an extremely tedious, difficult and frustrating procedure for the reason that there was no assurance of accurate alignment of the bands. Moreover, visual approximation also proved to be time consuming, inaccurate positioning of the bands on the missile often occurred and great difficulty was experienced in manipulating the bands, and slippage and subsequent misalignment also occurred even after the bands were adjusted in position on the missile.

The present invention is constructed and arranged to overcome all the difficulties heretofore encountered by providing a positioning jig having a great degree of precision and accuracy and which correctly positions the handling bands on the missile in aligned adjusted position.

An object of the present invention is to provide means for correctly positioning the handling bands on a missile body.

Another object of the invention is to provide jig means releasably clamped to handling bands on a missile so that the band may be aligned thereon.

Still another object of the invention is to provide jig means adapted to be detachably mounted on the handling bands of a missile and having adjustable positioning means cooperating with complementary means on the bands and missile to facilitate alignment of the bands on the missile.

A further object of the invention is to provide jig means having clamping devices or locking devices for releasably attaching the jig means to the missile handling bands.

A still further object of the invention is to provide positioning devices for correctly and uniformly positioning the forward and aft missile handling bands in proper relationship on a missile body so that accurate mating of the missile stowage and handling lugs on these bands with their respective guide rails is accomplished both in land and shipboard handling and stowage operations.

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 an elevational view of an ordnance missile illustrating the conventional forward and aft handling bands mounted thereon and the positioning jig of the present in connection therewith;

FIG. 2 is a transverse sectional view taken substantially on the line 2—2 of FIG. 1 and illustrating the aft handling band and jig.

FIG. 3 is a fragmentary view in perspective of a portion of the missile body with the aft handling band mounted thereon and aft positioning jig in position prior to being attached to the band;

FIG. 4 is a fragmentary plan view of one end of the

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saddle of FIGS. 2 and 3, illustrating the jig pin and adjustable arrangement therefor;

FIG. 5 is a sectional view taken on the line 5—5 of FIG. 4;

FIG. 6 is a fragmentary plan view of the central portion of the saddle of FIGS. 2 and 3, partially broken away and in section and illustrating the band lug clamping device;

FIG. 7 is a sectional view taken on the line 7—7 of FIG. 6;

FIG. 8 is a view similar to FIG. 7 illustrating the clamping device in clamping or locking engagement with the lug on the aft handling band;

FIG. 9 is a fragmentary view in perspective of a portion of the missile body with the forward handling band mounted thereon and illustrating the manner in which the forward positioning jig is connected thereto;

FIG. 10 is a fragmentary end view of the elements of FIG. 9 with the forward positioning jig in a position prior to being attached to the forward handling band;

FIG. 11 is a fragmentary view of one of the forward jigs illustrating a clamping or locking device in connection with the supporting lug of the forward handling band;

FIG. 12 is a fragmentary plan view of one end of the saddle of the forward jig illustrating the jig pin or positioning element and the adjustable arrangement therefor;

FIG. 13 is a sectional view taken on the line 13—13 of FIG. 12 with the jig pin or positioning element in a position to be moved into the wing socket or recess in the missile body; and

FIG. 14 is a view similar to FIG. 13 with the jig pin or positioning element disposed within the wing socket in the missile body.

Referring now to the drawings, and more particularly to FIG. 1, there is shown a conventional rocket or missile M. In order to facilitate handling of the missile, suitable handling bands 10 and 11 are provided, 10 designating the aft handling band, and 11 designating the forward handling band. Since it is of the utmost importance that these bands be correctly positioned and aligned on the missile to facilitate handling of the missile, a positioning jig generally indicated by the numeral 12 is employed to position the aft band 10, a similar positioning jig generally indicated by the numeral 13 being employed to position the forward band 11, these jigs being hereafter referred to as aft jig 12 and forward jig 13.

For a more complete understanding of the aft jig 12 attention is directed to FIGS. 2 through 8. As best shown on FIGS. 2 and 3 the aft jig 12 comprises a saddle generally indicated by the numeral 14 of U-shaped configuration having a central portion 14' and terminal inclined end portions 15. The saddle further includes mutually spaced upstanding flanges 16 connected by a bottom wall 17 and provided with a boss or support 18 disposed between flanges 16 and located at the terminal end of each portion 15. The wall 17 of the saddle is provided with a centrally disposed rectangular opening or slot 19 having mutually spaced transverse flanges 21 bordering thereon and connected to the side flanges 16 of the saddle. The slot 19 receives the conventional simulated shoe or T-shaped lug 22 carried by, and disposed at the center of the aft band 10, as the jig 12 is positioned on the band, FIG. 2. As best shown on FIGS. 3, 7 and 8 a locking device 23 is carried by a cross shaft 24, the terminal ends of the shaft being rotatably mounted in flanges 16 of saddle 14, the locking device comprising an actuating handle 25 and a cam 26 mounted adjacent one end thereof and adapted to engage the lug 22 on band 10.

The bosses 18 are each provided with a centrally disposed bore 27 in which is rotatably mounted a sleeve 28 provided with an adjusting knob or wheel 29. A positioning pin 31 is carried by and eccentrically mounted in

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the sleeve 28 and has a handle or grip element 32 at one end and a socket engaging lug 33 at the other end thereof. It will be noted on FIGS. 3 and 4 that a cover plate 34 is attached to the bosses 18 by screws 35, the plate being provided with suitable designations 36 which cooperate with graduations 37 on the knob sleeve 28 to insure proper positioning of the socket engaging lug 33.

For proper and quick radial alignment of the aft handling band with the aft positioning jig the locking device or cam latching mechanism 23 is moved to a position shown on FIG. 7, the saddle 14 of the jig 12 is then placed over the aft band 10, as shown in FIG. 3, and thereafter moved to the position of FIG. 2 with the lug or shoe 22 on the band 10 extending through slot 19 in wall 17 of the saddle and located between transverse flanges 21. With the saddle in this position the adjusting knobs 29 are adjusted until the positioning pin 33 carried by each of the members 31 are in alignment with the rectangular openings or sockets 38 formed in the conventional fin islands 39 carried by and circumferentially disposed about the missile M, as best shown on FIGS. 2 and 3. When the pins 33 are in alignment with the openings in the fin island the pin is moved an amount sufficient to cause the lugs 33 thereon to move into the openings 38 in the fin island 39. With the jig and components in the aforesaid position on the aft band 10 the cam locking device 25 is moved from a position shown in FIG. 7 to the position shown in FIG. 8, into engagement with the T-shaped lug 22 and thus radial centering of the aft missile band 10 on the missile M is accomplished, the band thereafter being securely attached to the missile in the conventional manner.

When it is desired to remove the jig from the band, the cam locking device 23 is moved from the position shown in FIG. 8 to the position shown in FIG. 7, whereupon pressure on the shoe or lug 22 is relieved. The two pins 31 are then moved outwardly an amount sufficient to disengage the lugs 33 thereon from their respective openings 38 in the fin islands 39. When this has been done the aft jig may be readily removed from the band and missile.

Referring now to FIG. 9 through FIG. 14, the forward positioning jig 13 used in connection with the forward handling band 11 comprises a saddle, generally indicated by the numeral 41, formed of a U-shaped channel member having a central portion 42 terminating in downwardly inclined end members 43. The saddle further includes mutually spaced upstanding flanges 44 connected by a bottom wall 45. As more clearly shown on FIG. 9, each of the inclined positions 43 carries a substantially V-shaped member or frame 46 secured to one of the flanges 44 as at 47 and provided with legs or arms 48 and 49. The terminal end of each arm 48 is secured to a side hook or plate 51, as at 52, the terminal end of each arm 49 being secured to a support member 53, as at 54. It will be noted, FIG. 9, that one terminal end of each support 53 is secured to a centrally disposed arm 55, the other terminal end of each support 53 being secured to each side hook 51, as at 56, the side hooks each being provided a recess 57. One end of the arm 55 is connected to one of the flanges, the other end thereof carrying a member or tubular element 58.

Each of the inclined end members is provided with a positioning pin assembly generally indicated by the numeral 59. For a more complete understanding of the construction and arrangement of the pin assembly attention is directed to FIGS. 12 through 14 wherein one of these assemblies is shown in detail. It will be noted that the assembly comprises a plate 61 slidably mounted on the bottom wall 45 of the saddle 41 by screws 62 attached to the plate and slidably disposed within slots 63. The plate is provided with a sleeve 64 extending through an enlarged opening 65 formed in the wall 45 of the saddle and in communication with the aforesaid slots 63.

A positioning pin, generally indicated by the reference character 66, the pin being slidably arranged in the sleeve, 75

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comprises a shaft 67 having a gripping handle 68 at one end and a wing socket pin 69 at the other end thereof. To provide suitable adjustment of the sleeve 64 and pin 69 carried thereby, an adjusting knob 71 is rotatably mounted in a bearing 72 carried by the wall 45 at the terminal end thereof, the knob 71 being provided with a threaded shaft 73 in threaded engagement with a member or block 74 attached to the plate 61. By this arrangement the socket pin may be moved to a desired position during attachment of the jig to the forward band 11 and the missile M. As best shown on FIGS. 9 and 11 a locking or latch device 75 is pivotally mounted on the side plates 51, as at 76, the device 75 comprising a handle 77 terminating at one end thereof into a cam locking head 78 and adapted to engage the conventional supporting lug 79 carried by the band 11 similar to the lug shown in the copending application of Harold Himmelberger et al., Serial No. 173,314, filed February 14, 1962, titled "Material Handling Device."

It is to be noted that each of the portions 43 is provided with an index mark or indicator 82 adapted to cooperate with vernier scale 83 carried by each of the plates 61 thereby to indicate proper adjustment of the plates and positioning of the wing socket pins 69 with respect to the wing sockets 84 formed in the conventional wing socket islands 85 carried by the missile.

For proper and quick radial alignment of the forward handling band with the forward positioning jig, the latch or locking device 75 is moved to a position shown in full lines on FIG. 11, the saddle 41 including the elements 48, 49, 53 and 55 carried thereby are then placed over the forward band 11, as shown in FIG. 10 and thereafter moved to the position of FIG. 9 with the member 58 on rod 55 disposed about shackle boss 81 centrally disposed on the band 11 and the lug 79 thereon disposed within recess 57 in plate 51. With the saddle and components thereof in the aforesaid position the adjusting knobs 71 are rotated until the plates 61 are moved an amount sufficient to align the wing socket pins 69 carried by shaft or positioning pin 66 with the wing sockets 84, at which time the vernier scale readings should be checked to make sure that the scale readings are the same for both adjusting knobs 71. With the positioning pins 66 aligned within the sockets 84 in the wing island 85, the positioning pins 66 are moved an amount to cause the wing socket pin or lug 69 thereon to move into the socket 84. When this has been done the cam locks or latch mechanism 75 mounted on plate 51 are moved from a full line position, FIG. 11, to the dashed line position thereof and into locking engagement with the supporting lugs on the forward band 11 and disposed within the recesses 57 on plates 51 whereupon the band is securely locked in position on the missile.

When it is desired to remove the jig, the cam locking devices are moved from a dashed line position, FIG. 11, to the full line position thereof, whereupon the pressure on the supports or lugs 79 is relieved. The two pins 66 are then moved an amount sufficient to disengage the socket pins or lugs 69 thereon from their respective wing socket opening 84 in the wing islands 85. When this has been done the forward jig may be readily removed from the band and missile.

When the forward jig 13 has been removed from the missile a conventional support shoe or lug 87 is attached to the forward handling band 11 between the pairs of ears 86 carried thereby, the shoe 87 being shown in dashed outline, FIG. 10, the lug being adapted to cooperate with rear support lug or shoe 22 during specific missile handling and transfer operations.

From the foregoing it will be apparent that the present invention provides means for quickly and accurately positioning and aligning forward and aft handling bands on a missile and which may be readily attached thereto and removed therefrom, and in which adjustable positioning means thereon cooperate with complementary means on

the missile to facilitate alignment of the bands on the missile with respect to each other and the aforesaid fin and wing islands.

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.

What is claimed is:

1. A jig for positioning and aligning a handling band on a missile comprising a U-shaped saddle having a centrally disposed straight portion terminating in a pair of oppositely disposed inclined arms, a bearing carried by and disposed at the terminal end of each arm of said pair of arms and having a centrally disposed bore extending therethrough, an actuating knob having a sleeve carried thereby and rotatably mounted in the bore in each bearing, a positioning pin eccentrically mounted in each of the sleeves, a socket engaging pin mounted at one end of each positioning pin and a hand grip mounted on the other end thereof, a cam locking device pivotally mounted on the saddle and movable from an initial position to a locking position, a cover on each of said bearings and having indexing means thereon, and indicating means carried by each of the sleeves and cooperating with said indexing means thereby to determine the position of the socket engaging pins.

2. A jig for positioning and aligning a handling band on a missile body comprising a U-shaped saddle terminating in a pair of downwardly disposed arms, an adjustable support carried by each of said arms, a positioning pin slidably mounted in each of the supports and movable from an initial position to a socket engaging position, an actuating device operatively connected to each of the supports for moving the supports to an adjusted position, a frame structure carried by said U-shaped saddle, a shackle receiving member carried by and centrally disposed on the frame, locking means carried at each side of the frame, and a plate carried by and disposed at each side of the frame and cooperating with said locking means.

3. A claim according to claim 2 wherein said adjustable support includes a plate slidably mounted on the U-shaped saddle and having a sleeve for receiving the positioning pin.

4. A claim according to claim 3 wherein said positioning pin includes a body portion having a socket engaging lug at one end thereof and a hand grip at the other end thereof.

5. A claim according to claim 3 wherein said actuating device includes an adjusting knob rotatably mounted at each terminal end of the arms and having a shaft in threaded engagement with the adjustable support.

6. A claim according to claim 3 wherein said frame structure includes a centrally disposed rod having one end connected to the U-shaped saddle and the other end connected to said shackle receiving member, a pair of supports having one end thereof connected to said rod and the other end thereof connected to each plate, and a pair

of substantially V-shaped members disposed on opposite sides of the rod with the apex of each member connected to the saddle and the free ends thereof connected to one of each of said supports and one of each of said plates.

7. A claim according to claim 3 wherein each of said plates is provided with a lug receiving recess.

8. A claim according to claim 3 wherein locking means includes a latch member pivotally mounted on each of the plates and having a cam locking surface thereon and movable from an initial position to a lug engaging position.

9. A positioning and aligning apparatus adapted to be detachably mounted on a missile body having a pair of mutually spaced handling bands mounted thereon, which comprises jig means for each of said bands and including U-shaped saddle means, adjustable and slidably mounted positioning means carried by said saddle means, socket means in said missile body for receiving said positioning means when the positioning means are moved into alignment therewith, actuating means operatively connected to the positioning means for moving the positioning means into alignment with said socket means, means on the positioning means for moving the positioning means into socket means when the positioning means are in alignment therewith thereby to accurately position the bands on the missile body, and cam locking means carried by the saddle means and cooperating with complementary means on the bands for radially centering the bands and releasably locking the jig means thereto.

10. A positioning and aligning apparatus adapted to be detachably mounted on a missile body having a pair of mutually spaced handling bands thereon, jig means including saddle means cooperating with said bands, adjustable and slidably mounted positioning means carried by said saddle means, means including sleeve means for adjusting said positioning means on the saddle means, socket means in said missile body for receiving the positioning means when the positioning means has been adjusted an amount sufficient to be in registration with the socket means, actuating means including a rotatable knob for moving the positioning means into registration with the socket means, grip means on the positioning means for slidably moving the positioning means into the socket means when the positioning means are in registration therewith thereby to accurately position the bands on the missile and with respect to the socket means, and cam locking means carried by the saddle means and cooperating with complementary means on the bands for radially centering the bands on the body and for releasably locking the jig means thereto.

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