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Burris

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[54] **RIFLESCOPE MOUNT**

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[52] **U.S. Cl.** ..... **42/1 S**, 33/250

[51] **Int. Cl.** **F41c 27/00**, F41g 1/38

[58] **Field of Search** ..... 42/1 S; 33/245, 250

[56] **References Cited**

UNITED STATES PATENTS

2,306,972	12/1942	Meisel	42/1 S
2,491,431	12/1949	Unertl et al.	42/1 S
3,424,420	1/1969	Seiderman	42/1 S
3,611,606	10/1971	Sefried et al.	42/1 S

OTHER PUBLICATIONS

"Redfield 1971 Scopes–Mounts–Sights," 1971 Catalog 2 page insert received May 17, 1971.

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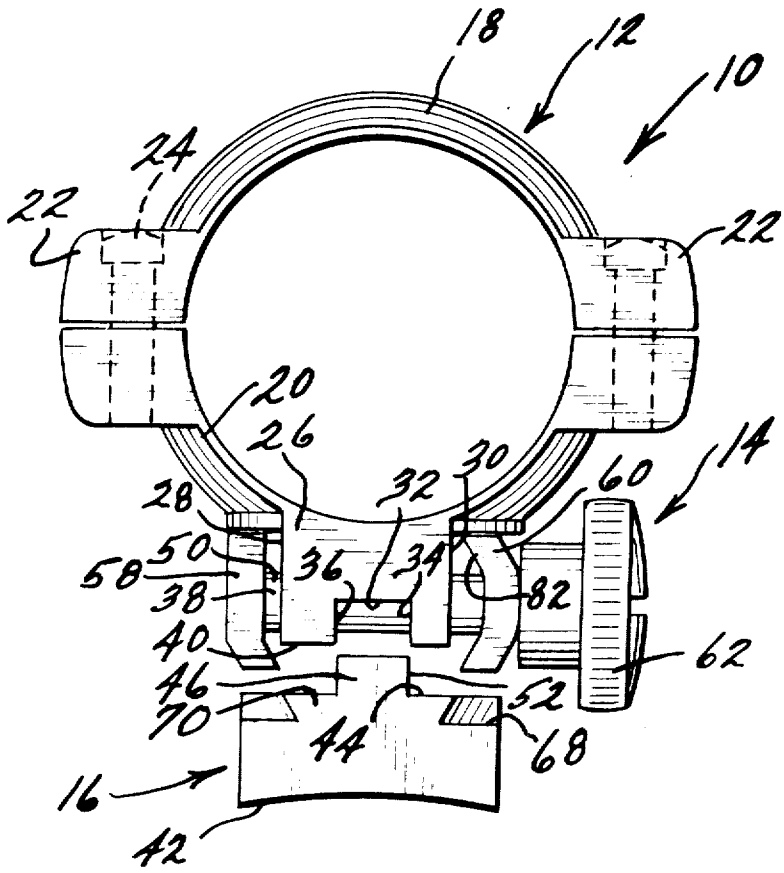
[57] **ABSTRACT**

A ring-type dovetail mount for attaching a riflescope to the barrel or receiver of a rifle that includes a base, a split ring that sits atop the base and a clamp subassembly that detachably fastens the two together in assembled relation is disclosed. The base has parallel undercut grooves alongside thereof that produce a dovetail-shaped rail topped by a longitudinally extending recoil rib having a transverse notch therethrough. The split ring is longitudinally grooved to fit down over the recoil rib. The clamp subassembly includes a screw, the shank of which does not rotate but extends across the groove in the split ring and seats within the notch in the recoil rib. The head of this screw defines the fixed shoe of a clamp that engages the undercut groove on one side of the dovetail rail while a movable shoe is drawn against the other by a nut.

13 Claims, 9 Drawing Figures



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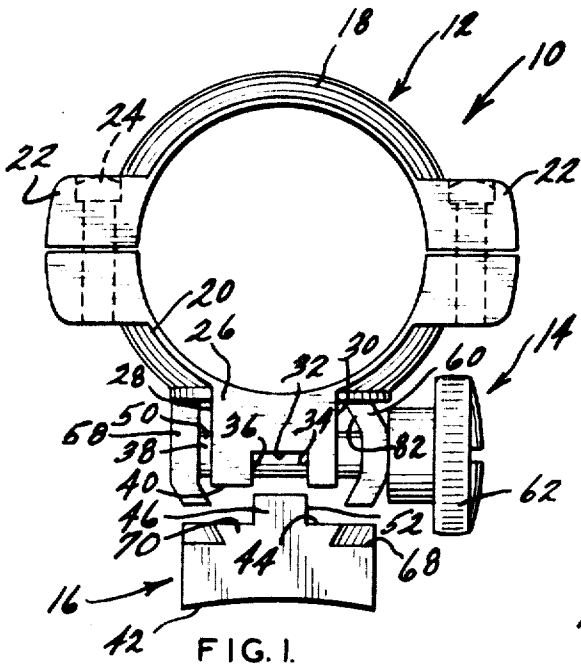

FIG. 1.

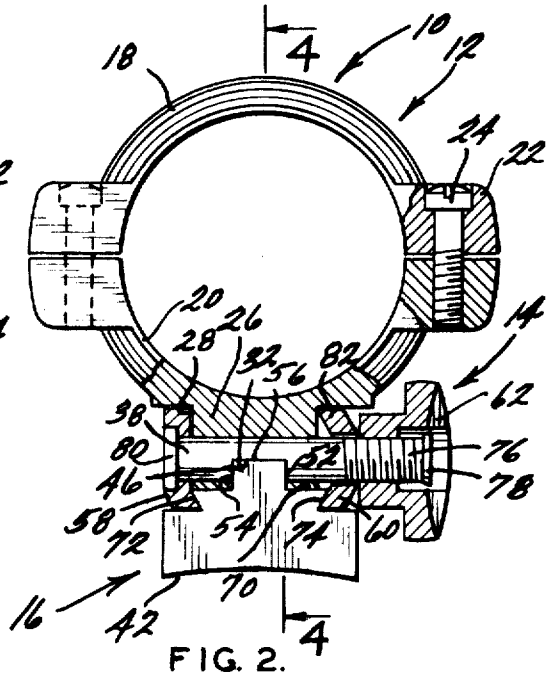

FIG. 2.

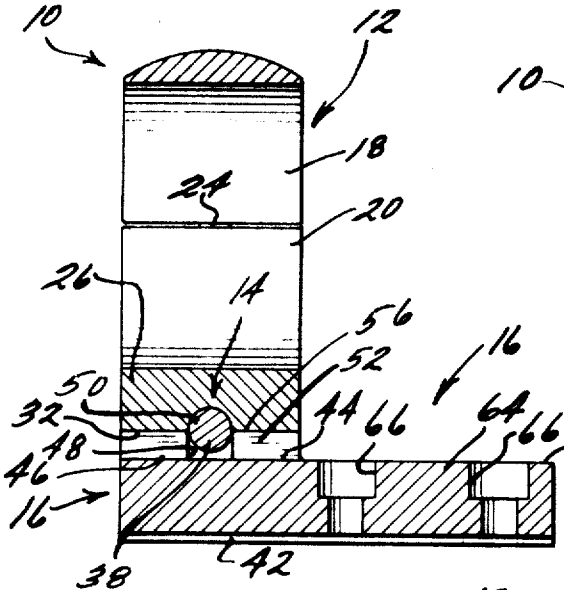

FIG. 4.

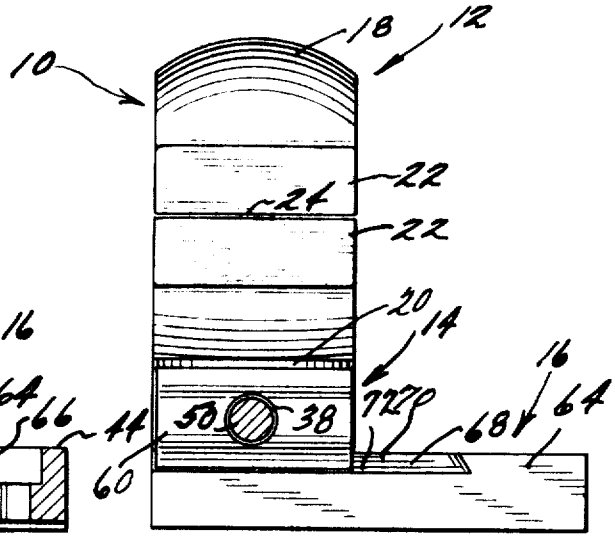

FIG. 3.

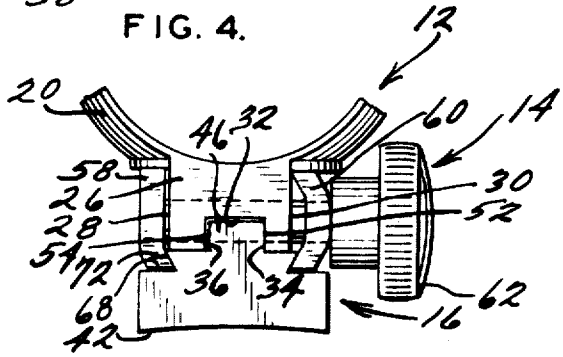

FIG. 5.

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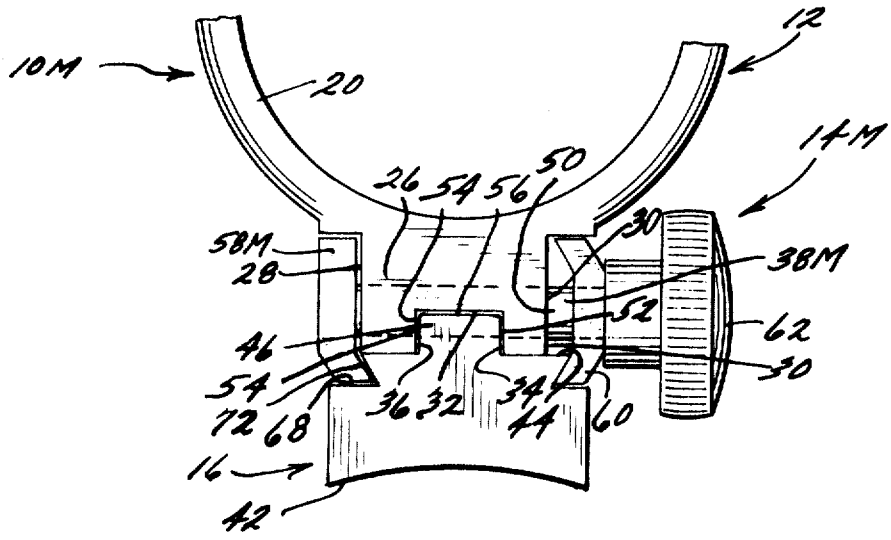

FIG. 6.

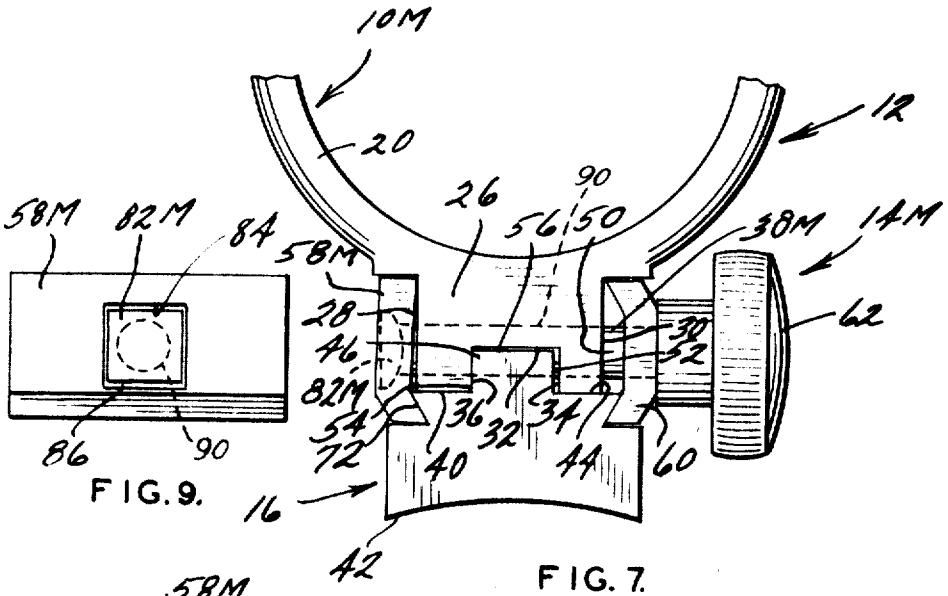

FIG. 9.

FIG. 7.

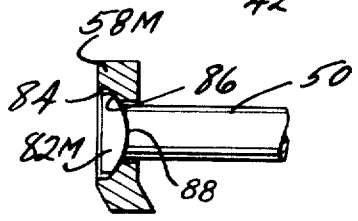

FIG. 8.

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RIFLESCOPE MOUNT

An accurate riflescope with precision optics and a rugged mechanical system that will withstand both recoil from a heavy powder load and the occasional abuse of hunting in rough country is expensive, so much so, in fact, that few hunters are able to afford one for each different rifle they may own. They prefer, therefore, to be able to remove and remount their scope on any one of several rifles with a minimum of time and effort while remaining confident that it will go back in place in precisely the same adjusted position it occupied originally. Unless this can be done, the mount must be considered a more or less permanent one because it becomes completely impractical to "sight-in" the rifle all over again every time the scope's position is disturbed. Some shooters may even wish to remove the scope from their rifle and substitute some type of so-called "iron" sight for target shooting provided, once again, it can be done in such a way that the scope is returned to the rifle in exactly the same position. Needless to say, this is no simple problem to solve because, not only does one have to design a mount that will return the scope to a precise position vertically and transversely while at the same time securing it against relative longitudinal movement, but this feat must be duplicated for both the front and rear mounts.

It has now been found in accordance with the teaching of the instant invention that these and other desirable objectives can be achieved by the novel, though unobvious, expedient of fastening a split ring to a dovetail rail with a clamp that has the fixed and movable shoes thereof so related to one another and to the base both structurally and dimensionally that these elements always return to the same precise pre-existing relationship. In the preferred form of the invention, the so-called "fixed shoe" defines a head of the clamp subassembly screw that does not move at all relative thereto; whereas, in an alternative embodiment, this same shoe can tilt slightly with respect to the screw shank while remaining fixed against relative rotation. Both embodiments "return to zero" but in somewhat different ways. In one, the axial pressure of the nut against the movable shoe pushes the grooved lug on the bottom of the split ring against the near face of the recoil rib leaving the gap at the remote face thereof. Conversely, the alternative embodiment functions in the opposite manner by pulling the screw shank toward the movable shoe causing the fixed shoe to tilt and press the grooved ring lug up snug against the remote face of the recoil rib.

Both embodiments can be relied upon to accurately reposition the scope in precisely its former location and with no adjustments of any type being required. Loosening and retightening of one nut on each of the front and rear mounts does the complete job. Once in place, the scope is securely fastened to the rifle barrel and can readily withstand the shocks to which it is subjected by reason of the recoil from a heavy powder load.

One pair of split rings remains fastened to the riflescope barrel at all times, a set of ring bases is permanently mounted on each rifle on which the scope is to be used, and a single pair of clamp subassemblies provides the detachable connection therebetween. In fact, the clamp subassemblies can be used to fasten the rings directly to the grooved receivers found on certain .22 caliber rifles.

Accordingly, it is, therefore, the principal object of the present invention to provide a novel and improved riflescope mount.

A second objective of the invention herein disclosed and claimed is the provision of a unit of the type aforementioned that is virtually insensitive to recoil even when used on large caliber rifles with heavy powder loads.

Another object is to provide a scope mount that is readily adaptable for use on the various sizes, types and shapes of rifle barrels.

Still another objective of the within-described invention is the provision of a scope-mounting bracket which, once the barrel has been tapped and the bases mounted, no longer requires the services of a skilled gunsmith to mount and demount the scope.

An additional object is to provide an improved riflescope mounting assembly that requires no tools so that the scope can be removed and remounted in the field following the initial installation.

Further objects of the invention defined herein are to provide a riflescope mount that is simple, lightweight, rugged, compact, versatile, uncomplicated, easy to use, simple to manufacture and even decorative in appearance.

Other objects will be in part apparent and in part pointed out specifically hereinafter in connection with the description of the drawings that follows, and in which:

FIG. 1 is a rear elevation showing the split ring in position to seat atop the base and the clamp subassembly in released position;

FIG. 2 is a rear elevation similar to FIG. 1 except that the ring is shown releasably clamped in place atop the base and portions of the ring and clamp subassembly have been broken away and shown in section;

FIG. 3 is a side elevation of the unit, with the nut removed and the shank of the screw in the clamp subassembly shown in section;

FIG. 4 is a section taken along line 4—4 of FIG. 2;

FIG. 5 is a fragmentary rear elevation similar to FIG. 1 except showing the elements in fully assembled relation;

FIG. 6 is a fragmentary rear elevation similar to FIG. 5 showing a modified form of the mount with the shoes in position ready to seat within the undercut grooves alongside the dovetail rail;

FIG. 7 is a fragmentary rear elevation of the modification of FIG. 6 but showing the clamp subassembly thereof in tightened position;

FIG. 8 is a fragmentary detail, portions of which have been shown in section, revealing the tiltable connection of the fixed shoe on the upset head of the pin; and,

FIG. 9 is an elevational view of the pin and shoe of FIG. 8.

Referring next to the drawings for a detailed description of the present invention and, initially, to FIGS. 1–5, inclusive, for this purpose, reference numeral 10 has been chosen to designate the riflescope mount in its entirety while numerals 12, 14 and 16 have been selected to similarly denominate the ring, clamp subassembly and base thereof. Ring 12 is of the split-ring type having upper and lower arches 18 and 20 with integral outturned bosses 22 at the extremities thereof which mate in face-to-face relation and are connected together by a screw fastener 24. Ring arches 18 and 20 together with the aforementioned fasteners cooperate

to define a clamp adapted to releasably fasten around the barrel of a riflescope (not shown).

The lower arch **20** of the ring includes an integrally formed foot **26** which projects downwardly from a position intermediate its ends. This foot parallels the axis of the ring in spaced relation to the latter and it has essentially vertical sidewalls **28** and **30** that are located on opposite sides of a longitudinally extending groove **32** that opens downwardly as shown. As illustrated, groove **32** is offset slightly toward the righthand sidewall **30** when the ring is received from the rear as in FIGS. **1, 2** and **5.**

Groove **32** is shown as having a generally rectangular cross section with the right and left faces **34** and **36,** respectively, thereof parallel to one another and normal to the transversely extending axis of the thumbscrew **38** which intersects the latter. These groove faces are also essentially perpendicular and they lie in planes paralleling the axis of the ring which in turn, of course, supposedly parallels the axis of the rifle bore. The bottom surface **40** of the foot is preferably planar and horizontal.

Base **16** has the underside **42** thereof cut to provide a concavity with a radius matching that of the rifle barrel or receiver upon which it is to be mounted. The top surface **44** is planar and essentially horizontal except for upstanding recoil rib **46** that rises vertically between its side margins and extends longitudinally down the middle thereof. This recoil rib **46** is interrupted intermediate its front and rear ends by a transverse notch **48** (FIG. **4**) adapted to receive the shank **50** of the screw **38.** With the shank **50** of the screw seated as shown in FIG. **4** within the notch **48** in the recoil rib **46,** almost no relative longitudinal movement between the ring **12** and base **16** can take place when the rifle recoils.

The right and left sides **52** and **54,** respectively, of rib **46** are perpendicular, parallel to one another and parallel to the mating faces **34** and **36** of the groove **32.** The top surface **56** of the rib is planar, horizontal and at right angles to its sides.

Now, before proceeding further, it would be good to explore in some detail the critical relationships between the mating ring foot and base surfaces just described as well as those which are not critical. Note in FIG. **5** that the depth and width of groove **32** is greater than the height and width of the rib **46** that enters the latter. Thus, when these parts occupy the assembled relation shown most clearly in FIG. **5,** the top surface **56** of the rib does not seat in the bottom of the groove nor does the left face **36** of the latter contact the opposed surface **54** of the rib. What this means, of course, is that from a functional standpoint rib surface **54** needn't necessarily be vertical, planar or even parallel to the opposite face **52** so long as it remains out of contact with the opposed groove face **36.** On the other hand, as a practical matter the shape shown is by far the easiest to machine and no useful purpose would be served by making it any other configuration. This same thing is true of the other non-mating surfaces, namely, the top of the rib **56** and the bottom of the groove **32** together with the outside surfaces of the foot.

The critical mating surfaces, therefore, are the righthand faces **34** and **52** of the groove and rib, respectively, and the bottom **40** of the ring foot which rests atop the upwardly facing surface **44** of the base. It is important that opposed faces **34** and **52** are parallel to one another as this provides substantial area contact. Opposed planar surfaces are the easiest to machine and little would be gained by having non-planar parallel mating surfaces especially when relative longitudinal movement is prevented by the notch and pin interlock. Running these plane parallel surfaces in parallel relation to the ring axis and the latter, in turn, in parallel relation to the rifle bore axis is, obviously, of considerable practical importance from an alignment standpoint. Finally, these plane, parallel longitudinally extending surfaces **34** and **52** preferably lie in normal relation to the axis of the shank **50** of thumbscrew **38** so that when the latter is tightened to fasten the ring to the base there will be no force component produced which would tend to slip one of these surfaces up or down along the other.

The next set of critical mating surfaces are the upwardly facing platform **44** defined atop the base **16** and the bottom surface **40** of the ring foot. These surfaces should be parallel to one another and, preferably, parallel to the axis of the set screw. These surfaces could, of course, be other than horizontal but to tilt them would serve no useful purpose, would be expensive and might conceivably even result in some vertical displacement of the ring axis should the clamp subassembly fail to bring mating vertical surfaces **34** and **52** into face-to-face contacting relation with one another.

While on the subject of critical versus non-critical surfaces, attention is directed to FIGS. **6** and **7** where a comparison thereof with FIG. **5** will reveal that surfaces **36** and **54** become the mating ones instead of **34** and **52** as was the case with the embodiment just described. In other words, ring **12** in the alternative embodiment of FIGS. **6** and **7** moves to the right relative to the base and rib atop thereof rather than the left. The reason for this is that the fixed shoe **58** of the principal form of the mount illustrated in FIGS. **1–5** is fastened against relative tiltable movement with respect to the screw shank **50;** whereas, in the alternative embodiment of FIGS. **6–9,** fixed shoe **58M** is mounted nonrotatably on shank **50** of thumbscrew **38M** but is free to tilt relative thereto. The differences in the clamping action between the two clamp subassemblies **14** and **14M** will be described in greater detail presently, it being sufficient to note for now that the ring moves to the left in the first and to the right in the second thus switching the critical and non-critical mating surfaces of the rib and grooves. As far as the horizontal mating surfaces are concerned, they remain the same in both embodiments.

Before leaving the subject of these critical vertical mating surfaces on the groove and rib, cognizance should also be taken of the fact that both of the illustrated embodiments are shown assembled as righthand mounts where the movable shoe **60** and nut **62** are to the right of the shooter as he raises the rifle into firing position. The base **16** can, of course, be turned end-for-end and not effect this relation, provided both vertical faces **52** and **54** of its rib will mate interchangeably with the opposed critical surface of the groove. On some rifles, the base may mount more satisfactorily one way than the other. This fact coupled with the fact that the ring may need to be rotated 180° to place the nut **62** on the lefthand side for lefthanded shooters makes it advisable that vertical surfaces **34** and **36** of the groove mate interchangeably with vertical surfaces **52** and **54** of the rib even though the relationship between one of

the two opposed pairs thereof is critical in any given mounting situation.

Summarizing the foregoing, all faces vertical surfaces **34, 36, 52** and **54** are preferably parallel to one another, normal to the axis of the clamp bolt shank **50,** and parallel to the axis of the ring. Any other configuration, while easily made operable in accordance with the teaching of the instant invention, is generally more expensive and difficult to machine as well as being less versatile.

Referring once again to FIGS. **1–5,** the base will be seen to project well beyond one face of the ring so as to provide an extension **64** through which the mounting screws (not shown) can pass that fasten the base down atop the rifle barrel or receiver. Countersunk passages **66** are provided for this purpose arranged as shown in FIG. **4** one in front of the other. Alongside the rib in the area occupied by the ring and clamp subassembly are a pair of undercut grooves **68** cooperating with one another to define a dovetail rail **70.** This rail cooperates in a manner which will be explained in detail presently with the clamp subassembly **14** to hold the ring down securely atop the base. The upwardly and outwardly inclined faces **72** of these undercut grooves mate with the interior oppositely inclined surfaces **74** along the lower edges of the shoes **58** and **60.** Surfaces **72** thus comprise the only critical undercut groove surfaces and they are preferably both planar and respectively parallel to the ring axis although oppositely inclined relative to each other.

The clamp subassembly **14** remains to be described and it is most clearly revealed in FIGS. **1, 2** and **5** to which detailed reference will now be made. At one end of the shank **50** is a threaded section **76** onto which is screwed the nut **62.** In the particular form shown, the threaded end is upset slightly as shown at **78** once the nut is in place so as to prevent its being removed and lost. Merely loosening it produces sufficient slack to allow the shoes **58** and **60** to be spread apart and thus disengaged from the dovetail rail **70.**

The opposite end of the shank is also upset to produce a head **80** (FIG. **2**) which, in the particular embodiment illustrated in FIGS. **1–5** is fastened to the fixed shoe **58** so that neither relative rotational or relative tiltable movement can occur. In other words, from a functional standpoint, the fixed shoe could be formed as an integral part of the shank.

The fixed shoe **58** comprises a small, generally rectangular plate having the lower margin thereof bent inward slightly to define inclined surface **74** that parallels and mates with the opposed inclined groove surface **72** thus locking it therebeneath.

The movable shoe **60** is also rectangular and has its lower margin similarly bent to produce an inside surface **74** that mates with the oppositely inclined undercut groove surface **72.** In the case of the movable shoe, however, its upper margin is also turned inwardly to produce a cleat **82** that will engage the opposed exterior face of the ring foot and move the latter to the left until the righthand vertical groove surface **34** comes to rest against the mating surface **52** of the rib. An examination of FIG. **2** will reveal that the movable shoe **60** is loosely mounted on the shank **50** so that it is free to tilt relative to the latter.

As thus constructed, shoes **58** and **60** come together with a vise-like action upon actuation of the nut **62** to push the movable one to the left in the direction of the fixed one. When this occurs, movable shoe **60** strikes the righthand vertical face **30** of the foot **26** and pushes it to the left closing the gap between opposed surfaces **34** and **52** of the groove and rib respectively. The movable shoe **60** is free to rock on the shank **50** of the clamp screw to the degree necessary to force the ring foot snug against the rib. Note also in this connection that the ledge **44** atop the base is wider than the underside **40** of the foot that rests atop thereof thus leaving a gap between the fixed shoe **58** and the lefthand vertical face **28** of the foot at all times. If this were not the case, the foot might otherwise strike the fixed shoe before the gap at the right side of the rib closed with the result that the assembly would not necessarily have returned to the same position. As it is, on the other hand, the precise transverse relationship of the elements **12, 14** and **16** is reproduced each time they are assembled and clamped together.

Next, note that when the inside inclined faces **74** of the shoes engage the mating inclined surfaces **72** of the undercut grooves, the ring foot will be drawn down until its undersurface **40** rests firmly atop the upturned surface **44** of the base. To insure that this takes place, the depth of the undercut grooves **68** is chosen such relative to the height of the shoes that the latter will not contact the bottom of the former when the ring foot seats atop the base. Provision is thus made for returning the elements **12, 14** and **16** of the assembly **10** to their precise pre-existing vertical relationship each time they are reassembled.

The manner in which the relative longitudinal positions of the elements is reproduced and maintained has already been described in detail, namely, the locking of the screw shank **50** within the transverse notch **48** in the rib; therefore, the only other relationship that remains to be explored is the axial orientation of the ring relative to the rifle barrel bore axis through the base **16** which remains permanently fastened to the latter. Actually, this is rather simply accomplished by restoring the alignment between the groove and rib that has already been set forth in considerable detail.

Next, with reference once again to FIGS. **6–9,** inclusive, the modified version **10M** of the riflescope mount will be set forth in detail. The ring **12** and base **16** remain exactly the same and all the changes are embodied in the clamp subassembly **14M.** Even in the latter subassembly, several of the elements are unchanged such as, for example, movable shoe **60,** nut **62** and the shank **50** of modified thumbscrew **38M.** Aside from the slightly different functional interrelationship to be set forth in detail presently, the main changes lie in fixed shoe **58M** and the thumbscrew **38M,** in particular the head **82M** of the latter. In the particular form revealed in FIG. **9,** the head **82M** will be seen to have a rectangular configuration and fit loosely into a similarly shaped socket **84** in the fixed shoe. The rectangularly shaped head and socket therefor cooperate with one another to prevent relative rotational movement therebetween.

The bottom **86** of the socket is shown having a cylindrically concave shape while the opposed undersurface **88** of the head **82M** is similarly curved to mate therewith and define a connection capable of limited relative tiltable movement about a horizontal axis. The hole **90** in the shoe through which the thumbscrew shank **50** passes is oversize to accommodate the aforementioned relative motion.

The above-described tiltable connection of the fixed shoe on the head of the thumbscrew is intended as being merely representative of one type that can be used while preventing relative rotational movement from taking place and, of course, there are many other configurations well known in the art by means of which this selfsame functional relationship can be achieved. The critical factors are that the shank not be free to rotate relative to the fixed shoe so that the nut **62** can be tightened and, secondly, that the fixed shoe be free to tilt from side-to-side about a horizontal axis.

Finally, with reference to FIGS. **6** and **7**, it will be seen that the unit functions somewhat differently than that of the previously described embodiment. In this one as the nut **62** is tightened, the fixed shoe tilts to the right using the base as its fulcrum and engages the left vertical face **28** of the ring foot. As the nut is tightened further, fixed shoe **58M** pushes the ring to the right until the lefthand face **36** of the groove engages the corresponding opposed face **54** of the rib. The shoes cooperate as before to draw the ring foot snugly down atop the base and keep it properly oriented fore and aft.

What is claimed is:

1. The riflescope mount which comprises: a base with its underside adapted for attachment to a rifle, said base having its top surface bordered on both sides by undercut grooves cooperating therewith to define a dovetail rail, and said base having an upstanding rib atop thereof extending longitudinally intermediate its side margins, said rib including a transverse notch intermediate its ends; a split ring sized to encircle the barrel of a riflescope in supporting relation thereto and with a foot depending from its lower arch, the undersurface of said foot being shaped to mate with the top surface of the base and permit relative transverse slidable movement therebetween when thus assembled, said foot having a downwardly opening groove extending longitudinally intermediate the sides thereof sized to loosely receive the rib, and said foot including a transverse passage intersecting the downwardly opening groove therein positionable in transverse alignment with the notch in the rib upon relative longitudinal movement between the ring and base in assembled relation; and, a clamp subassembly operative to detachably fasten the ring atop the base, said subassembly including a bolt with a head on one end of its shank and a nut threaded on the other end thereof mountable within the passage in the foot, said bolt cooperating with the notch in the rib when seated therein to lock the ring and base together against relative longitudinal movement, and a pair of shoes mounted on the shank of the bolt between the nut and head thereof for relative transverse movement, the lower margins of said shoes defining jaws adapted to engage the dovetail rail within the undercut grooves and draw the foot down snug atop the base upon actuation of the nut in a direction to close the gap therebetween, and at least one of said shoes including a jaw along the upper edge thereof adapted upon actuation of the nut in the aforesaid direction to engage the adjacent side of the foot and push same sideways until the adjacent face of the downwardly opening groove engages the opposed face of the rib.

2. The riflescope mount as set forth in claim **1** in which: the width of the foot is less than the width of the rail.

3. The riflescope mount as set forth in claim **1** in which: the jaws along the bottom of the shoes lie spaced above the bottom of the grooves when the foot is seated atop the base.

4. The riflescope mount as set forth in claim **1** in which: the shoe remote from the nut is non-rotatably fastened to the shank of the bolt.

5. The riflescope mount as set forth in claim **1** in which: the sides of the downwardly opening groove lie in substantially parallel planes normal to the axis of the bolt shank; and, in which the opposed face of the rib is planar and adapted to mate in face-to-face parallel relation with either face of the downwardly opening groove when assembled in juxtaposed position thereto.

6. The riflescope mount as set forth in claim **1** in which: the shoe remote from the nut is fastened to the shank and shaped so as to remain in spaced relation to the foot when the adjacent shoe has pushed the latter against the rib.

7. The riflescope mount as set forth in claim **1** in which: the height of the rib is less than the depth of the downwardly opening groove so as to leave a gap therebetween in assembled relation.

8. The riflescope mount as set forth in claim **1** in which: the shoe remote from the nut is mounted on the shank for limited tiltable movement sufficient for the upper marginal edge thereof to engage the near side of the foot and push the latter sideways until the adjacent face of the downwardly opening groove contacts the opposed face of the rib.

9. The riflescope mount as set forth in claim **1** in which: the downwardly opening groove is offset toward one side of the foot.

10. The riflescope mount as set forth in claim **1** in which: the downwardly opening groove is offset toward the side of the foot nearest where the side of the rib engages same.

11. The riflescope mount as set forth in claim **1** in which: the upper marginal edge of the shoe adjacent the nut carries the jaw and the remote shoe of the pair includes only a lower jaw.

12. The riflescope mount as set forth in claim **1** in which: the upper marginal edge of the shoe remote from the nut defines an upper jaw.

13. The riflescope mount as set forth in claim **1** in which: the upper marginal edges of both shoes define jaws adapted to contact the foot on opposite sides thereof, and the shoe remote from the nut is tiltable from side to side on the shank.

* * * * *