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WAVE GUIDE CLAMP

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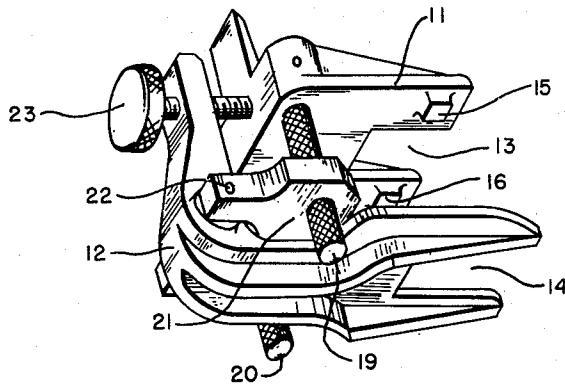


FIG. 1

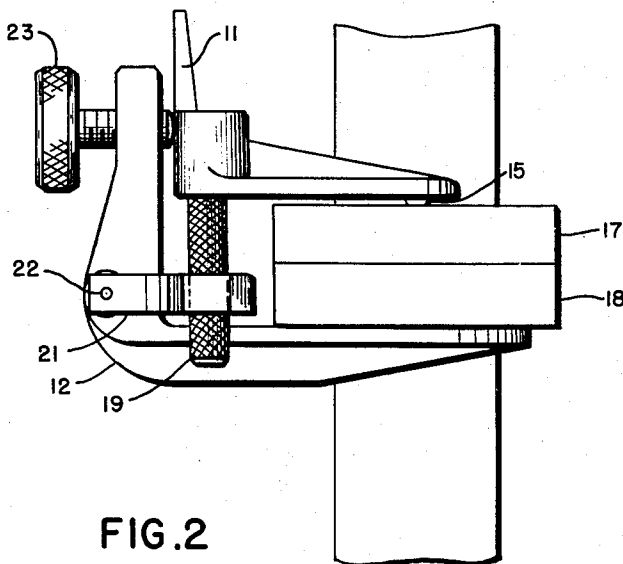


FIG. 2

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WAVE GUIDE CLAMP

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5 Claims. (Cl. 24-248)

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This invention relates to mechanical clamping devices, and more particularly to a clamping device intended for use in connection with wave guides.

Wave guide sections are usually provided with a flange at each extremity for use in making a joint with other wave guide sections. In order to prevent leakage of radio microwave energy at the junction of adjoining wave guide sections, it is necessary to have the wave guide sections in alignment, and in addition, to have a uniform contact between the adjacent flanges. For permanent installations, these requirements are easily met by drilling and tapping the flanges so that they may be held rigidly together by machine screws. For temporary installations, it has been customary to employ various makeshift devices, such as machinist's C clamps, for joining the adjacent flanges together. These methods have proven unsatisfactory, as they do not meet the requirements for leak proof joints. A clamping device for temporarily holding wave guide sections together should be of single unit design for easy application, and should lend itself to quick application without the use of tools. In addition such a clamping device should assure that the wave guide sections will be held in alignment; should provide uniform contact between the flanges; should be adjustable to cover any irregularities which might be encountered in the flange dimensions; should not require the installations of any special fittings to the wave guide, or require alterations of any kind to the standard flanges; and should not be capable of causing mechanical damage to the wave guides with which it is used.

An object of this invention is to provide a novel clamp which may easily be applied to flanged sections in order to retain such sections in a fixed relationship.

Another object of this invention is to provide a novel clamp which may quickly and easily be adjusted to fit varying sizes of flanged sections which are to be retained in a fixed relationship with respect to each other.

Still another object of this invention is to provide a novel clamp for clamping together flanged wave guide sections in order to prevent leakage of radio microwave energy through the joints connecting such sections.

Further objects and advantages will be apparent from the following specification when taken with the accompanying drawings in which:

Fig. 1 is a perspective view of a wave guide clamp constructed in accordance with the principles of this invention.

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Fig. 2 is a side view of the wave guide clamp of Fig. 1 applied to a wave guide which may be either of rectangular or round cross section.

Referring to the figures, there is shown a pair of jaws 11 and 12 having openings 13 and 14 respectively, cut therein to facilitate the mounting of the clamp about the flanges of a wave guide. A pair of raised bosses 15 and 16 are provided on the under surface of jaw 11 to assure a proper concentration of pressure upon flange 17 when the clamp is mounted thereon as shown in Fig. 2. A pair of guide bars 19 and 20 are rigidly mounted upon the under surface of the base of jaws 11 and provide a sliding connection for a slide member 21 which is designed to be slidably mounted thereon. Guide bars 19 and 20 have the outer surfaces thereof scored in order to facilitate a locking action with member 21 whenever torque is applied to that member. Member 21 is provided with two bored openings therein, the size of the bores being slightly larger, but closely approximating the diameter of the rods. It will readily be understood that the position of member 21 upon rods 19 and 20 may quickly and easily be varied as may be desirable so long as no torque is applied to the slide member. However, application of a slight amount of torque to member 21 immediately results in a locking action, thereby fixing the position of the slide member 21 upon the rods 19 and 20.

Second jaw 12 is pivotally mounted at point 22 upon slide member 21 so that the relative spacing of jaws 11 and 12 may be quickly set to contact the flanges 17 and 18 of a wave guide as shown in Fig. 2. A thumb screw 23 is threadably mounted in the upper rear portion of jaw 12.

In operation, the clamp is positioned around the sections of the wave guide which are to be held together, and member 21, together with jaw 12, is slid toward jaw 11 until the clamp jaws contact the flanges of the wave guide sections. Thumb screw 23 is then tightened, whereupon slide member 21 is immediately locked to the guide bars, thereby pressing the flanges firmly and uniformly together. It will be readily understood that when thumb screw 23 is tightened a sufficient amount to exert a small pressure against the rear portion of member 11, there will be produced sufficient torque of member 11 with respect to member 21 to produce the locking motion described above, since the axis of thumb screw 23 is not in line with the contact projections 15 and 16 of member 11. Since the slide member 21 is restrained by its pivot so that it cannot follow such a motion, a twisting motion of rods 19 and 20 with respect to member 21 will

result. Any further tightening of thumb screw 23 causes members 11 and 21 to swing on an axis through point 22, thereby causing the contact points 15 and 16 to exert pressure upon the flange 17. Since the contacting surfaces between the respective flanges of the waveguide sections are flat, a uniform seal is achieved.

The above specification relates to the present invention as applied to wave guides of rectangular cross section. This is only for the purpose of illustration, as the invention is equally applicable to wave guides of any cross section, as well as to clamping together other various fittings of the same general physical shape as wave guides.

What is claimed is:

1. A clamp comprising a first horizontal jaw, a plurality of vertical members rigidly secured to said jaw, a slide member slidably mounted on said members, a second horizontal jaw having a vertical extension pivotally mounted on said slide member, and screw means associated with said second jaw extension responsive to contact at a point beyond said pivot mounting with said first jaw for varying the relative spacing of the jaws through adjustment of said screw means.

2. A clamp comprising a first jaw, a pair of rods rigidly secured to the under surface of said jaw, a slide member slidably mounted on said rods, a second jaw of L-shaped cross section pivotally mounted near the angular junction thereof on said slide member, and a thumb screw disposed in the upper portion of said second jaw in juxtaposition to said first jaw for varying the relative spacing of said first and second jaws in accordance with second jaw rotation about the pivotal mounting as the screw is adjusted to frictionally grip the slide to the rods at the instant adjustment thereof.

3. A clamp comprising first and second jaw members, each of said jaw members comprising first and second mutually perpendicular arms, each of said first arms being adapted to engage the body to be clamped, a plurality of guide bars

rigidly secured to said first arm of said first jaw and extending perpendicularly to said first arm, a slide member formed with a plurality of openings therein, said plurality of openings slidably receiving said guide bars, means for pivotally mounting said slide member to said second jaw, and means associated with each of said second arms for providing relative movement therebetween.

4. A clamp for use with two wave guide sections, each of said wave guide sections being provided with a flange, said clamp rigidly holding said guide sections together in such a manner that the flange ends are adjacent and in contact with one another so as to provide a joint, said clamp comprising, first and second jaw members, each of said jaw members comprising first and second mutually perpendicular arms, each of said first arms being formed with an opening for receiving one of said sections of wave guide, a plurality of guide bars rigidly secured to said first arm of said first jaw member and extending perpendicularly of said first arm in a direction away from said second arm of said first jaw member, a slide member formed with a plurality of openings therein, said slide member openings slidably receiving said guide bars, means for pivotally mounting said slide member to said second jaw, and means associated with said second arms of said first and second jaw members for relatively moving said second arms whereby the spacing between said first arms is varied.

5. Apparatus as in claim 4 wherein the outer surfaces of said guide bars are scored.

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