Feb. 5, 1963 C. P. MISNER 3,076,948

QUICK DISCONNECT DEVICE FOR WAVEGUIDE FLANGES

Filed July 25, 1960

FIG. 1.

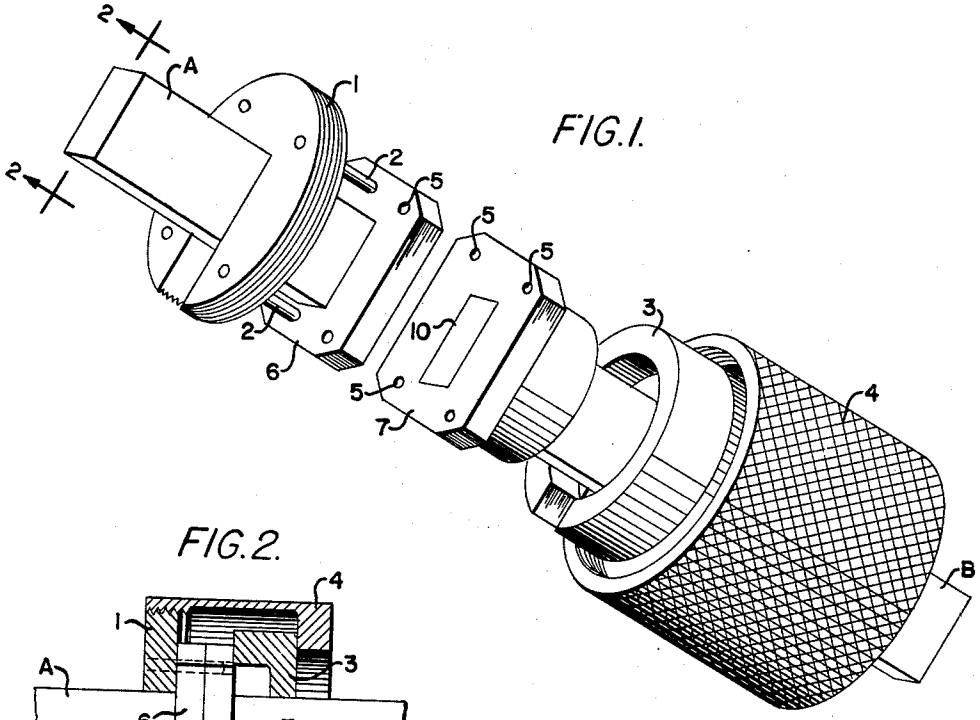


FIG. 2.

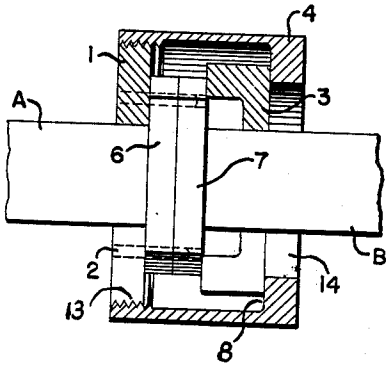


FIG. 4.

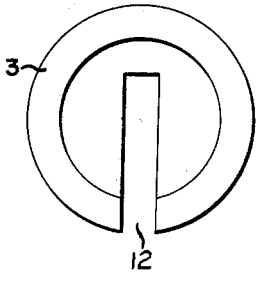


FIG. 3.

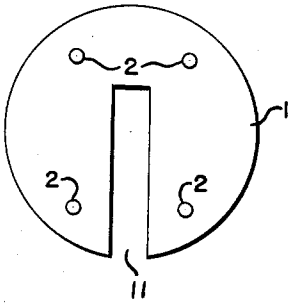
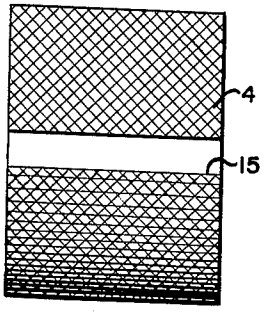


FIG. 5.



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QUICK DISCONNECT DEVICE FOR WAVEGUIDE FLANGES

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2 Claims. (Cl. 333—98)

This invention relates to a quick acting clamp for use in coupling together waveguide sections and more particularly, relates to such a clamp which without the use of tools allows the rapid connection and disconnection of such waveguides. This is a very desirable feature for laboratory or experimental purposes where frequent coupling and uncoupling of waveguide sections is necessary.

In the past it has been common practice to interconnect waveguide sections by means of bolts, or similar devices, through their connection flanges. Such an arrangement is time consuming and does not lend itself to quick connection and disconnection.

It is an object of this invention to provide a clamp which may be used on end flanges such as normally provided on waveguide sections, permitting the interconnection of the waveguide as used with electronic equipment quickly and easily and likewise permitting it to be disconnected just as readily.

It is another object of this invention to provide a clamping device for waveguide connections which is operable by hand, requiring no tools for assembly and disassembly.

It is a further object of this invention to provide a quick acting waveguide clamp which will provide both a mechanically and electrically tight connection between mating waveguide flanges.

It is a still further object to provide a quick acting waveguide clamp whereby all the parts of the clamping assembly can be placed on the waveguide without having the necessity of detaching the waveguide from the equipment to which it is coupled.

These and further objects will become apparent from the following description and drawings in which:

FIG. 1 is an exploded isometric view showing the various pieces of the clamp positioned on the two pieces of waveguide in an uncoupled assembly;

FIG. 2 is a cross-section view on the line 2—2 of FIG. 1 of the clamp in position coupling together two waveguide sections;

FIG. 3 is an elevation view of the flange pressure plate;

FIG. 4 is an elevation view of the nut lock up plate; and

FIG. 5 is an elevation view of a modified coupling nut.

Illustrated in FIG. 1 are two waveguide sections A and B, each terminated at one end in a flange 6 and 7, which are formed with a central rectangular aperture 10. The flanges 6 and 7 are provided with bolt holes 5 adapted to receive therewithin conventional bolts for coupling the two waveguide sections A and B.

The connector of the invention is shown in FIG. 1 as assembled and comprises positioned on waveguide section A a flange pressure plate 1 to which are fastened guide pins 2 so positioned as to slidably engage holes 5 of flanges 6 and 7. Positioned on waveguide section B behand flange 7 are a nut back up plate 3 and a coupling nut 4.

The two waveguide sections A and B may be quickly coupled and clamped together by sliding flange pressure plate 1 tightly against flange 6 with guide pins 2 inserted into holes 5 of flanges 6 and 7, sliding nut back-up plate 3 against flange 7, and sliding coupling nut 4 over nut

back-up plate 3, and flanges 7 and 6 into threaded engagement with flange pressure plate 1. By rotating coupling nut 4 the waveguide flanges 6 and 7 are drawn tight as shown in FIG. 2.

Referring to FIG. 3 and FIG. 4 it will be noted that pressure plate 1 and back-up plate 3 each have a rectangular slot 11, 12 so formed therein as to allow placement of the part on the waveguide section A or B by slideably inserting the respective waveguide into the slot.

As illustrated in FIG. 2 coupling nut 4 is so constructed that its forward threaded opening 13 is larger in diameter than back-up plate 3 and flanges 6 and 7. The rearward opening 14, as a result of the formed shoulder 8 is smaller in diameter than back-up plate 3, yet large enough to pass over flanges 6 and 7.

The coupling nut 4 may also be formed as shown in FIG. 5 with a slot 15 similar to the slots in pressure plate 1 and lock up plate 3, to facilitate the placement of the nut on the waveguide section. Generally, one remote end of the waveguides A or B will be available for passing the nut 4 on the guide as shown in FIG. 1 and the slot will not be required in all members. Wherever a remote free end of the waveguide is not available the coupling can still be readily assembled if the nut 4' is slotted in the manner shown in FIG. 5.

Many modifications of the invention will now be apparent and such may be made without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. A quick assembly coupling for joining in axial alignment a pair of waveguide sections each of which is provided with a terminating flange plate extending perpendicularly beyond the waveguide outer wall; comprising a first disc having a threaded periphery and an open-ended rectangular slot therein for slideably inserting the first of said waveguide sections, said first disc having a diameter greater than the diameter of said flange plates with the slot thereof being sufficiently small to prevent the passage therethrough of the flange plate on said first waveguide section, at least a pair of projecting rods extending from said first disc and transversely through said flange plates to secure said flange plates in aligned facing relationship, a second disc having an open-ended rectangular slot for slidably receiving the second of said waveguide sections, the slot of said second disc being sufficiently small to prevent the passage therethrough of the flange plate on said second waveguide section, a cylindrical nut having internal threads at one end adapted to engage the threads of said first disc and an internal flange at the other end for bearing against said second disc, said internal flange being dimensioned to permit the passage of the flange on said second waveguide section and to prevent the passage of said second disc, whereby upon installing said first disc upon said first waveguide section and said nut and said second disc upon said second waveguide section, said sections will be drawn into axial alignment by threading said nut upon said first disc.

2. A coupling as claimed in claim 1 wherein said cylindrical nut is provided with a longitudinal slot for slidably receiving the second of said waveguide sections.

References Cited in the file of this patent

UNITED STATES PATENTS

2,529,381	Frear	Nov. 7, 1950
2,643,139	Hamilton	June 23, 1953
2,788,498	Hardaway	Apr. 9, 1957

FOREIGN PATENTS

654,135	Great Britain	June 6, 1951