

J. W. FRENCH.
 PERISCOPE AND LIKE INSTRUMENT CASING.
 APPLICATION FILED NOV. 12, 1918.

1,298,632.

Patented Mar. 25, 1919.

FIG: 1.

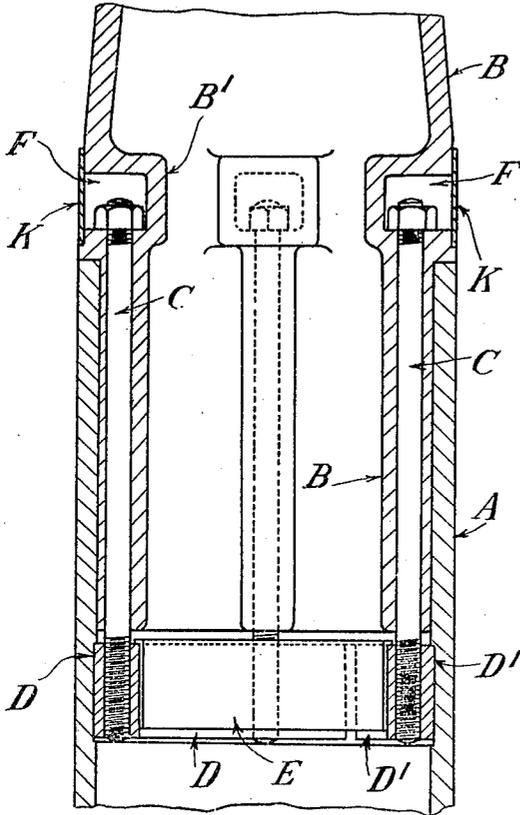


FIG: 2.

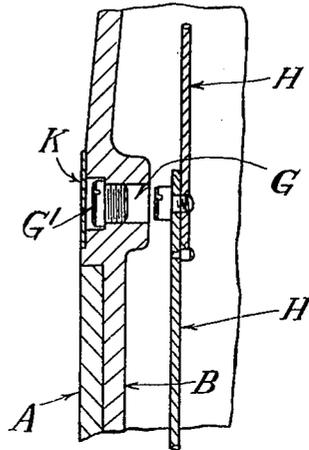


FIG: 3.

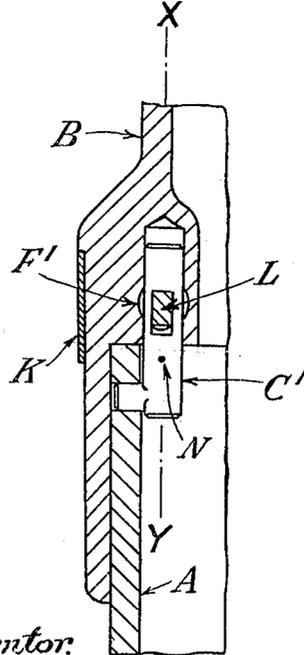
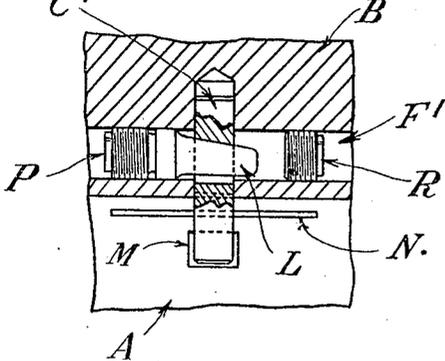


FIG: 4.



Inventor:

James Weir French.
 By J. Walter Fowler
 Atty.

UNITED STATES PATENT OFFICE.

JAMES WEIR FRENCH, OF GLASGOW, SCOTLAND, ASSIGNOR TO BARR AND STROUD LIMITED, OF ANNIESLAND, GLASGOW, SCOTLAND.

PERISCOPE AND LIKE INSTRUMENT CASING.

1,298,632.

Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed November 12, 1918. Serial No. 262,233.

To all whom it may concern:

Be it known that I, JAMES WEIR FRENCH, a subject of the King of Great Britain and Ireland, and a resident of Glasgow, Scotland, have invented new and useful improvements in or Connected with Periscope and like Instrument Casings, of which the following is a specification.

This invention relates to periscope and like instrument casings of the type composed of tubular casing parts connected together co-axially, which, as far as possible, should be devoid of external surface projections, capable of excluding water under considerable pressure, formed so as to insure that the parts when assembled shall conform to some predetermined length within small limits while maintaining the same orientation and permitting in some cases access to be obtained from the exterior to mechanism contained within the casing.

The improvements according to this invention relate to, connecting casing parts together, sealing the joints of the casing, and the provision of apertures for giving access to the interior of the casing.

In connecting two tubular casing parts together the exteriors of which are circular in cross section, one, hereinafter referred to for convenience as the first or lower part, may be faced at its upper end and bored to receive the lower end of the second or upper part which is formed to present a shoulder conforming to the faced end of the lower part, or the lower part may be bored and formed to present a shoulder at the base of the bore against which the faced end of the upper part is adapted to bear. For drawing the two parts axially together longitudinal draw bars are provided, each of which at its foot or lower end is secured in the interior of, say, the lower part, for example, by being formed or fitted with means arranged to enter into engagement with the upper surface of an abutment in the interior of the lower part, which abutment may be provided by recessing, or by fitting a permanently fixed or removable part therein, and longitudinal passages are formed in the walls of the upper part, which extend to recesses formed in the exterior of the upper part, through which the bars are adapted to extend. When the two parts are assembled, the heads or tops of the bars, which are sufficiently long to project into the external

recesses, are fitted with tension means, such as nuts or keys, which on being tightened while bearing upon the bases of the recesses, cause the upper and lower parts to be axially drawn together with their complementary face and shoulder in contact. The draw bars may be made removable from the lower part, and, when this is done provision may be made for temporarily locking or supporting them in position before the parts are assembled. The overlapping parts of the casing and the longitudinal passages may be of considerable or very considerable length.

Some examples of construction according to this invention will now be described with reference to the accompanying drawing, in which:—

Figure 1 is a vertical sectional elevation showing casing parts connected together, and Fig. 2 is a vertical sectional elevation of the casing parts showing an aperture for giving access to the interior of the casing.

Fig. 3 is a vertical sectional elevation, and Fig. 4 is a sectional view taken about the line X Y of Fig. 3, showing casing parts connected together.

In the drawings, A designates the first or lower part and B the second or upper part of two tubular casing parts which are to be connected together.

In the form of construction shown at Fig. 1, four draw bars C are provided, which in use are arranged about a circle concentric to the axis of the casing parts and at equal distances apart. The foot end of the bars are secured in complementary pairs to two separate segmental shoes D D¹. In horizontal section each of the segmental shoes is less than half a circle. Within the lower part A, at a position beneath that to which, say, the end of the upper part B extends, an internal recess is formed, presenting a shoulder at its top to form an abutment, the plane of which, for instance, is normal to the axis of the casing. The peripheries and upper edges of the segmental shoes D D¹ are made to conform to this recess, so that, with the draw bars C attached to D D¹, the shoes may be introduced into the lower part A and fitted to rest therein with their upper edges against the top of the recess. For retaining the shoes in this position, a flanged ring E, adapted to fit between the shoes, may be inserted and retained in position by screws passing through its flange screwed

into the shoes D D¹. The wall about the lower end of the upper part B may, as shown, be of such thickness that the longitudinal passages are formed to extend from the base thereof. The interior portion B¹ of the upper part B in the region of the top end of the passages is thickened and external recesses F are formed therein. In the case as shown where nuts are provided for tightening the draw bars, each external recess F may be formed of sufficient size to accommodate a nut and spanner head for tightening it. Intervening between any of these external recesses, apertures G, see Fig. 2, may be formed to extend through the wall. For instance, in the case where two transmission rods for operating working parts of the instrument, one of which H only is shown, are provided extending upward in the interior of the casing having couplings at this position to which it is desirable to have access for connecting or disengaging the couplings, two apertures such as G may be formed on diametrical opposite sides, each located between two of the external recesses F, screw plugs G¹ being provided for closing these apertures. In assembling the two parts of a construction of this character, with the draw bars C fixed in position and the transmission rods H disconnected, a lubricant or other substance may be applied to the portions of the casing, draw bars and longitudinal passages, which are to lie in contact. The end of the upper part B is then inserted into the bore of the lower part A, the draw bars C passing into their respective longitudinal passages. The nuts are applied to the bars and tightened, and the transmission rods H coupled after which the plugs G¹ are inserted into the access apertures G. The external recesses F and sockets of the plugs G¹ which are disposed about the same transverse plane are then filled in with a sealing lubricant or substance and a sleeve K is applied which extends over and covers the sockets and recesses. This sleeve K may be thin and be brought to bear against a shoulder formed on the exterior of the upper part B and be locked against endwise displacement, for instance, by means of a screw.

In the form of construction shown at Figs. 3 and 4, two draw bars C¹ are provided, arranged diametrically on opposite sides of the casing, which are to be tightened by tapered keys L, and in which the second or upper part B is bored to receive the end of the first or lower part A, two diametrical holes M or internal recesses may be formed in the lower part A, at a position covered by the lower end of the upper part B, to receive studs projecting from the foot or lower end of each of the draw bars C¹, and for retaining the bars C¹ when inserted in position a spring ring N may be provided which passes

through the bars. In this case instead of external recesses being formed in the upper part communicating with the upper ends of the longitudinal passages, two transverse holes F¹ may be formed in the walls thereof, one for each passage, each transverse hole being contained within the wall of the upper part B at a distance from the axis thereof, tangential to the casing and parallel to one another. These holes may be circular, and each is intersected by the top of its draw bar C¹ which projects upward across it. In this part of the draw bar C¹, a transverse slot is formed into which the wedge shaped key L is adapted to be forced endwise, for instance, by means of a screwed plug P from one end of the transverse hole, and removed by being driven out by a pin inserted at the other. The screwed plug also acts to close the hole and a screwed plug R may be provided for closing the opposite end. In this form of construction the end face of the lower part A is forced endwise against a shoulder formed at the top end of the bore in the upper part B which is bored to fit tightly over the upper end of the lower part. After the plugs have been screwed in, the sockets remaining may be filled in as in the other case and a sleeve K applied to complete the joint.

I claim:

1. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part, connected together co-axially, a faced surface at the end of the first part, a shoulder on the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, one of the parts being bored to receive the end of the other part so that the faced surface end may bear against the shoulder, longitudinal draw bars each secured at its foot end in the interior of the first part, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, and tension means for application at the heads of the bars, for the purposes set forth.

2. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part, connected together co-axially, a faced surface at the end of the first part, a shoulder on the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, one of the parts being bored to receive the end of the other part so that the faced surface end may bear against the shoulder, longitudinal draw bars, means for removably securing the foot end of each draw bar in the

interior of the first part and temporarily supporting them in position, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, and tension means at the heads of the bars, for the purposes set forth.

3. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part, connected together co-axially, a faced surface at the end of the first part bored to receive the end of the second part, a shoulder on the exterior of the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, longitudinal draw bars, means for securing the foot end of each draw bar in the interior of the first part, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, and tension means at the heads of the bars, for the purposes set forth.

4. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part, connected together co-axially, a faced surface at the end of the first part, a shoulder on the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, one of the parts being bored to receive the end of the other part so that the faced surface end may bear against the shoulder, longitudinal draw bars, means for securing the foot end of each draw bar in the interior of the first part, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, tension means at the heads of the

bars and means for covering the recesses, for the purposes set forth.

5. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part connected together co-axially, the first part bored to receive the end of the second part, a faced surface at the end of the first part, a shoulder on the exterior of the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, longitudinal draw bars, shoes to which the foot end of the draw bars are secured, an abutment in the interior of the first part for the shoes to engage with, means for temporarily locking the shoes in position, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, and tension means for application at the heads of the bars, for the purposes set forth.

6. Periscope and like instrument casings composed of tubular parts, having two tubular casing parts, a first part and a second part connected together co-axially, the first part bored to receive the end of the second part, a faced surface at the end of the first part, a shoulder on the exterior of the second part at a distance from and presented toward its end conforming to the faced surface end of the first part, longitudinal draw bars, segmental shoes to which the foot end of the draw bars are secured, an abutment in the interior of the first part for the shoes to engage with, a ring to fit between the shoes, longitudinal passages formed in the walls of the second part through which the draw bars are adapted to extend, recesses formed in the exterior of the second part to which the passages extend and into which the heads of the draw bars are adapted to project, tension means for application at the heads of the bars, and means for covering the recesses, for the purposes set forth.

JAMES WEIR FRENCH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."