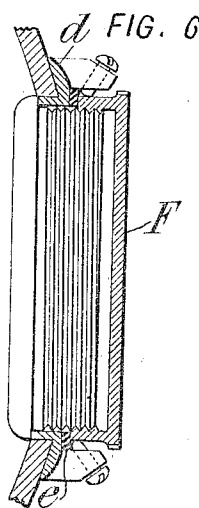
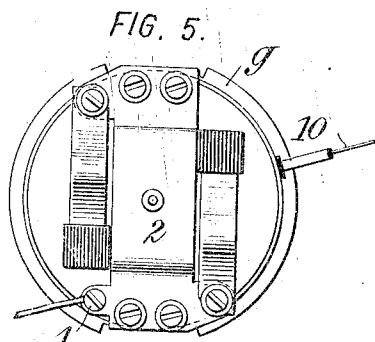
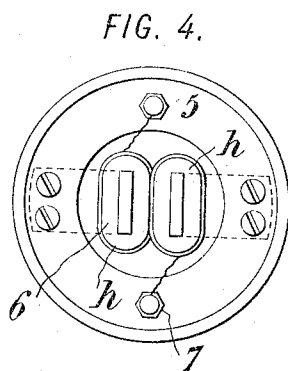
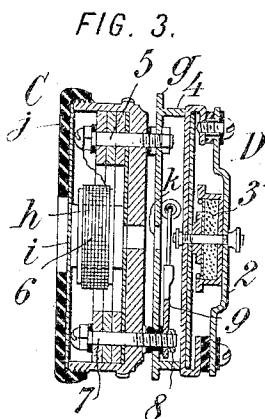
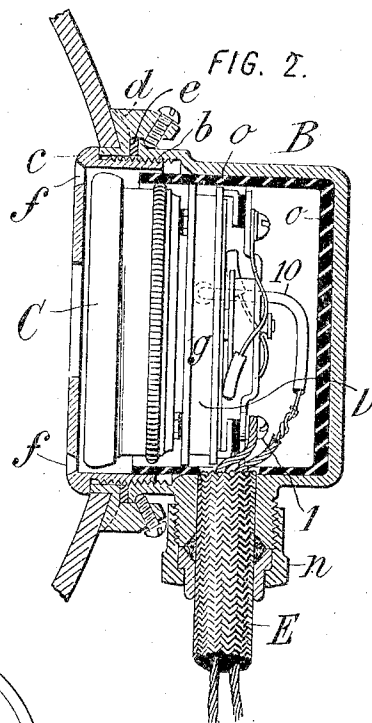
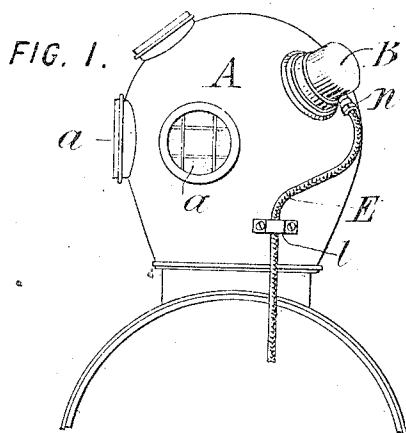


H. P. KRAFT & M. C. SCHWEINERT.
DIVING APPARATUS OR THE LIKE.
APPLICATION FILED SEPT. 3, 1907.

990,818.

Patented Apr. 25, 1911.



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UNITED STATES PATENT OFFICE.

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OF WEST HOBOKEN, NEW JERSEY.

DIVING APPARATUS OR THE LIKE

990,818.

Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed September 3, 1907. Serial No. 391,041.

To all whom it may concern:

Be it known that we, HENRY P. KRAFT, residing in the borough of Brooklyn, county of Kings, city and State of New York, and
5 MAXIMILIAN CHARLES SCHWEINERT, residing in West Hoboken, in the county of Hudson and State of New Jersey, both citizens of the United States, have jointly invented certain new and useful Improvements in Diving Apparatus or the Like, of which the following
10 is a specification.

This invention relates to telephone systems for use in connection with diving apparatus, submarine boats, diving bells, or the like,
15 and aims to provide certain improvements therein.

The telephone apparatus provided by our invention is specially applicable to divers' helmets, which are necessarily restricted as to
20 size and weight.

In its preferred form our invention comprises a telephone transmitter and receiver, mounted one over the other in a casing which is adapted to be detachably connected to the
25 helmet or other device. Preferably the parts are so constructed that the electrical connections are confined to the removable casing, so that all wiring within the helmet is avoided, and so that both instruments may be removed
30 with the casing, and the opening in the helmet closed by a cap or other suitable means.

Referring to the drawings, wherein we have shown our invention as applied to a diver's helmet,—Figure 1 is a side elevation
35 of such a helmet provided with our invention. Fig. 2 is an enlarged view showing the casing in vertical section and the telephone instruments in side elevation. Fig. 3 is a diametral section of the telephone transmitter and receiver. Fig. 4 is an elevation of the receiver with its disk removed. Fig. 5 is an
40 elevation of Fig. 3. Fig. 6 is a sectional view illustrating the supplemental cap.

Referring to the drawings, let A indicate
45 a diver's helmet of ordinary construction having windows *a a*. According to our invention we provide a casing B which is detachably secured to some portion of the helmet, preferably in the manner illustrated in
5 Fig. 2, wherein the casing is provided with an internal thread *b* which is engaged by a screw-threaded sleeve *c* having a flange bearing against the inner side of the helmet and

acting to clamp the casing B closely against the exterior of the helmet. Preferably a reinforcing collar *d* is soldered to the helmet as shown, and a packing washer *e* is interposed
55 between the casing B and the collar *d*. In order to provide a means for readily turning the threaded sleeve *c*, we prefer to make it in the general form of a cap and to provide
60 it with a series of perforations *f f* adapted to engage with a spanner or other wrench.

While separate casings B might be provided for the transmitter and receiver, we
65 have found in practice that a single casing may be utilized for both of these instruments. We have also found that it is not necessary to arrange the instruments opposite the mouth and ear, but that they may be
70 arranged in any convenient part of the helmet. As the body of the air within the helmet is inclosed, the sound vibrations are readily transmitted to and from the instruments, even though the latter may be placed
75 at the rear of the helmet. We are thus enabled to effect a considerable simplification of the apparatus by mounting both instruments in a single relatively small casing, and are also enabled to avoid any wiring within
80 the helmet. We have also discovered that the telephone transmitter and receiver may be mounted one over the other without interfering with their usefulness. By this means the device may be made very compact,
85 and a single opening in the helmet suffices for the passage of the sound waves to and from the transmitter and receiver. In the drawings we have shown the receiver C as mounted over, and in axial alignment with
90 the transmitter D. Preferably the transmitter and receiver are connected to a single plate *g*, so that they can be inserted and removed together, the plate *g* also serving as a means for mounting the combined instruments in the casing B, as shown in Fig. 2.

The receiver and transmitter may be of any usual type, the transmitter shown being of the carbon type, and the receiver being in general of the usual construction, having
100 actuating magnets *h h*, disk *i*, and perforated cap *j* (Fig. 3). The receiver is spaced apart from the transmitter, so as to provide a passageway for the sound waves, the disk *g* being perforated at *k* for the same purpose.
105 The receiver and transmitter may be oper-

ated on independent circuits if desired, but we have found that both instruments may be arranged in a single circuit without materially interfering with the operation of either instrument. The current enters the device through binding post 1, passes through bridge 2 of the transmitter, and thence through carbon 3, metal ring 4, binding post 5, receiver magnets 6, post 7, and thence through conductor plate 9 and wire 10.

The current is led to the instrument in any suitable way, preferably by insulated cable E, clamped to the side of the helmet by a suitable plate L. A stuffing-box *n* is provided to prevent ingress of water into the cap or casing B. In order to insulate the instruments, it is preferable to employ an insulator cap *o*, as shown in Fig. 2.

If it is desired to use the helmet without telephone connections, the casing B may be removed, and a shallow cap such as F (Fig. 6) secured in its place. In the act of removing the casing, the telephone transmitter and receiver are also removed, together with all electrical connections, so that the telephone connection is entirely separated from the helmet.

It will be observed that our invention has numerous advantages over those now in common use. One casing is utilized for both the receiver and transmitter, and this casing is of very small dimensions on account of the arrangement of the instrument. There is little or no extension of the instruments or other supporting means within the helmet, and no necessity of running wires inside of the latter. The instruments are preferably arranged at a point where they do not interfere with the vision or movements of the operator, and may be easily removed and replaced.

While we have described our invention in connection with a diver's helmet, it will be understood that it is equally applicable to other devices of a similar nature, such as submarine boats, diving bells, or the like. It will also be understood that we do not wish to be limited to the details of construction set forth herein, as wide variations may be made without departing from the invention.

We claim as our invention:—

1. A diver's helmet having a casing extending outwardly from its wall, in combination with a telephone transmitter and receiver mounted one over the other in said casing.
2. The combination with a diver's helmet or the like, of a casing in communication with the interior of the helmet for receiving a telephone instrument, and means for detachably securing such casing to such helmet.
3. The combination with a diver's helmet or the like, of a casing in communication

with the interior of the helmet for receiving a telephone instrument, and means for detachably securing such casing to the exterior of such helmet.

4. The combination with a diver's helmet or the like, of a casing for receiving a telephone instrument, means for detachably securing such casing to such helmet, and means for closing the opening in such helmet when the casing is removed.

5. The combination with a diver's helmet or the like, of a casing for receiving a telephone instrument, means for detachably securing such casing to such helmet, and a cap adapted to be engaged by such holding means when the casing is removed.

6. The combination with a diver's helmet or the like, of a telephone instrument in connection therewith, a passage leading to the exterior of the device directly opposite said instrument, means for closing such passage, and electrical connections passing through such means to said instrument, such connections extending directly from said instrument to the exterior.

7. A device of the character described, having a casing detachably secured thereto and communicating with the interior of the helmet, a telephone instrument mounted in said casing, and electrical connections passing through said casing to the exterior of the device.

8. A device of the character described, having a casing detachably secured thereto, a telephone instrument mounted in said casing, electrical connections passing through said casing to the exterior of the device, and a stuffing box on said casing through which said connections pass.

9. A device of the character described, having a casing detachably secured thereto, a telephone receiver and transmitter mounted in said casing, and electrical connections passing through said casing to the exterior of the device, said telephone transmitter and receiver being mounted one over the other and being adapted to be removed with said casing.

10. A device of the character described, having a casing B, and a screwthreaded sleeve *f* adapted to hold said casing in position.

11. The combination with a diver's helmet or the like, of a casing B, a telephone receiver C mounted therein, a telephone transmitter D mounted behind said receiver, and electrical connections for said receiver passing through said casing, said receiver and transmitter being in the same electrical circuit.

12. The combination with a diver's helmet, of a telephone receiver mounted at a point which is remote from the position of the ear of the diver.

13. The combination with a diver's hel-

met, of a telephone transmitter mounted at a point which is remote from the position of the mouth of the diver.

5 14. The combination with a diver's helmet or the like, of a casing for receiving a telephone instrument and means on the interior of the helmet for securing said casing to the exterior thereof.

10 15. The combination with a diver's helmet or the like, of a casing for receiving a telephone instrument and means on the interior of the helmet for securing said casing to the

exterior thereof and a cap adapted to be held in place by said means when the casing is removed.

In witness whereof, we have hereunto signed our names in the presence of two subscribing witnesses. 15

HENRY P. KRAFT.

MAXIMILIAN CHARLES SCHWEINERT.

Witnesses:

EUGENE V. MYERS,
THEODORE T. SNELL.