April 22, 1947. K. H. BLOMBERG ET AL 2,419,388

TELEPHONE HANDSET

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Fig. 1

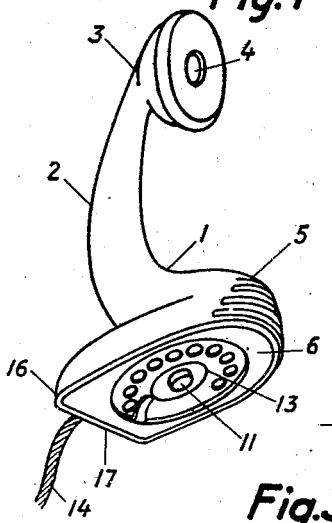



Fig. 2

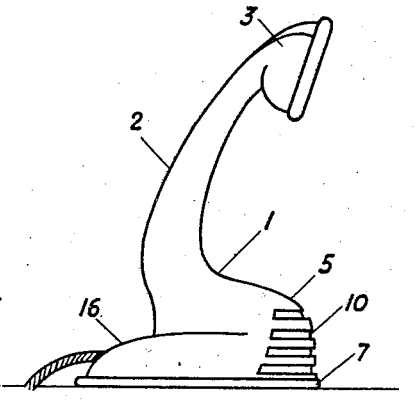



Fig. 3

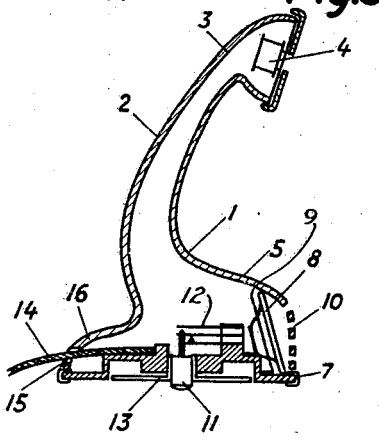
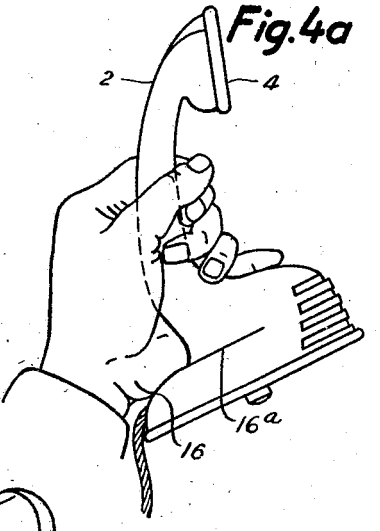



Fig. 4a



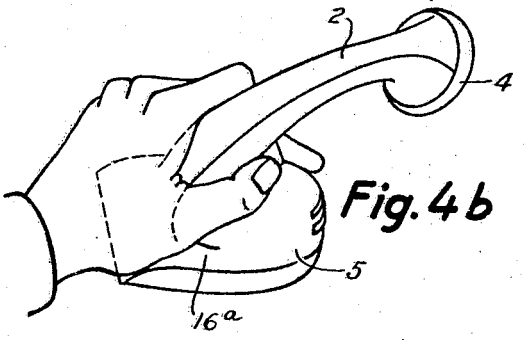




Fig. 4b

Inventors

K. H. Blomberg &

R. H. G. Lysell

By: Glascock Downing & Seebold

Attys.

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Fig.5

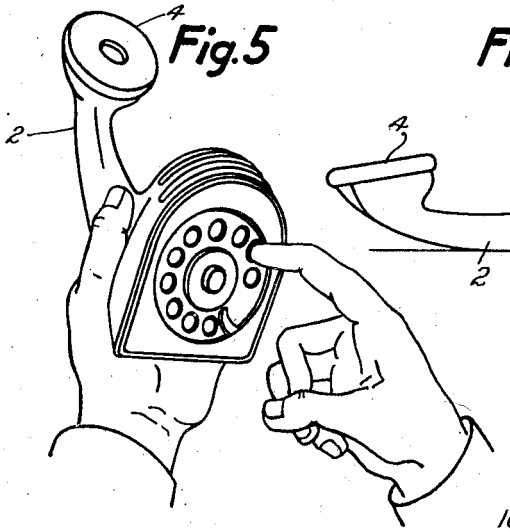



Fig.6

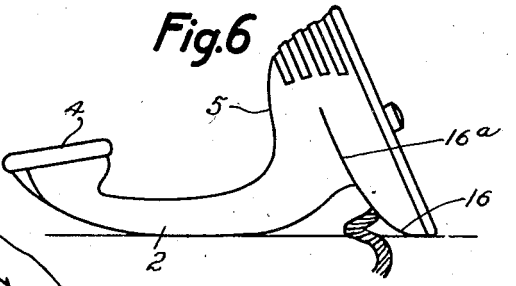



Fig.8

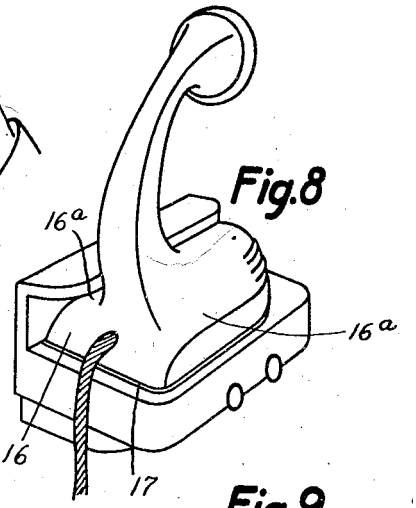



Fig.7

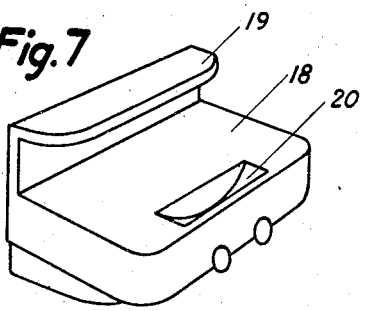
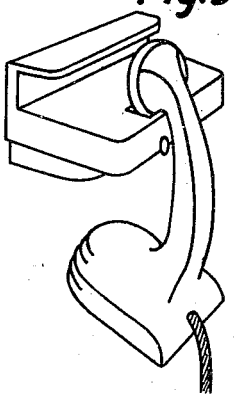



Fig.9



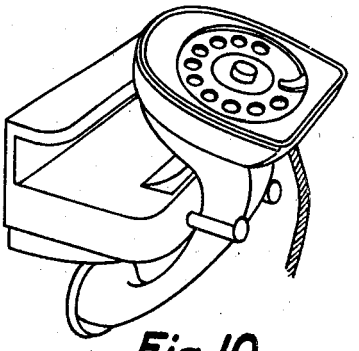


Fig.10

Inventors,
K. H. Blomberg
R. H. G. Lysell
By: Glascock Downing & Seebold
Attys.

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# UNITED STATES PATENT OFFICE

2,419,388

## TELEPHONE HANDSET

Knut Hugo Blomberg, Appelviken, and Ralph Åke Gösta Lysell, Midsommarkransen, Sweden, assignors to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden

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2 Claims. (Cl. 179—103)

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This invention relates to a telephone instrument of a new type. Hitherto used telephone instruments of a modern design consist of a handset and an instrument case mounted on the wall or placed on a table, containing the remaining devices required for speaking and signalling, like induction coil, dial, signalling bell, etc., provided with a switch hook for the placing of the handset with hereto pertaining device to enable switching from speaking to signalling position.

By way of distinction from these instruments the telephone instrument according to the invention has been made thus that the handset and the remaining devices which directly are handled by the caller, viz., the switch hook key or in case of automatic instruments the dial, form a unit which is held in the hand while calling but stands on a solid foundation, for example a table, when not used. The other devices (induction coil, condenser, signalling bell) are appropriately fitted in the wall terminal box of the instrument which might well be given the form of a shelf, where the instrument may be placed.

The telephone instrument according to the invention is moulded in such a way that the case forms an upright, the upper end of which supports the receiver and whose lower end widens into a base having a comparatively large supporting surface, within which the microphone and the remaining devices are fitted. The case is preferably made of pressed material or of pressed die-cast metal.

Standing telephone instruments of this kind have formerly been proposed, consisting of a handle with its pertaining base, but in those the microphone was arranged outside the base, while in the instrument according to the invention it has been placed within the same which is of considerable advantage.

As the telephone instrument should be held in the hand while calling it must be light in weight and should not weigh more than an ordinary handset. On the other hand it must be able to stand firmly on the table and must not be easily overturned. Besides being provided with a comparatively large supporting surface, its centre of gravity must be placed low, i. e., the devices must be placed as low down as possible in the instrument. According to the invention, microphone,

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switch hook key, dial, etc., are placed in the base of the instrument.

The switch hook key is arranged in the bottom of the instrument and is actuated by the weight of the instrument when this is placed on the table, whereby switching from speaking to signalling position is effected.

Due to the low centre of gravity, it is uncomfortable to hold the instrument by its upright when calling; one should instead hold it by its lower part. For that reason, according to the invention, this part of the case is moulded so as to be conveniently and comfortably held in the hand of the caller.

In order to have the comparatively heavy dial placed as low down as possible when automatic instruments are concerned, and to obtain at the same time a suitable and protected place for the same, it is, according to the invention, arranged at the bottom and is turned downwards, when the instrument is placed on the table. This makes it invisible and, moreover, the instrument occupies just a small space, which makes it very attractive in appearance. When dialling takes place, the instrument should be held in one hand and should be inclined backwards, whereby the bottom turns up, and thus the digits may be easily dialled by the other hand.

The invention will be explained more in detail in the description of the example of application indicated in the attached drawings.

Fig. 1 shows a perspective representation of an automatic instrument, Fig. 2 shows the instrument from the side, and Fig. 3 shows a vertical section of the same, Figs. 4 and 5 show how to hold the instrument while dialing and when calling, Fig. 6 shows the instrument in resting position and Fig. 7 shows a wall terminal box formed as a shelf for the instrument and Figs. 8, 9 and 10 show different ways of placing the instrument on the same.

As may be seen from Figs. 1, 2 and 3 the instrument consists of a case 1 made of pressed material. It is made in form of an upright 2, the upper part of which is developed into or supports a box 3, in which a receiver of some ordinary, light type is arranged behind an ear cap 4. At the bottom the upright widens into a base 5, which forms a comparatively large supporting surface. The front of the base is of

round form and the rear part is rectangular. The base as well as an appropriate part of the upright is hollow and forms a mantle, in which microphone, switch hook key, dial, etc., are fitted. These devices are preferably mounted on a bottom plate 6, fastened in the downward opening of the case.

In this example of application the border of the bottom plate is surrounded by a rubber band 7 which when the plate is screwed in the case, is pressed down between the lower rim of the case and the plate. This band prevents the instrument from sliding on the table and also prevents the making of marks on the table, if the instrument should be put aside obliquely.

The capsule transmitter 8 is fitted above the front part in a holder 9, in such a way that around the periphery it lies against the inside of the case as shown by Fig. 3. In front of the capsule transmitter the case is provided with appropriate sound openings 10, leading into the air chamber formed between the capsule transmitter and the microphone.

The sound openings 10 are formed in the front part of the base 5 and the ear cap 4 also faces forwardly so that it may be held against the ear when the openings are located in proximity to the mouth during the use of the instrument.

As may be seen from this example of application the switch hook key is fitted in the bottom plate 6 and consists of a spring actuated press button 11, which projects somewhat from the bottom. When the instrument is placed on the table, the press button is pressed in by the weight of the instrument, until the instrument is resting on the rubber band 7. Then the contact springs 12 are acted upon and switch over the instrument from speaking to signalling position. The press button has a rounded head which enables it to be pressed in and not aside, in case the press button should knock against the edge of the table or the like when the instrument is placed thereon, which might endanger the safe functioning of the instrument.

To avoid the possibility of the button remaining without being pressed, and, consequently, the instrument not being switched from speaking to signalling position, in case one should happen to put the instrument on edge on a flat object lying on the table, for instance a thin book or a newspaper, a pile of paper or the like, it has been made so as to protrude quite a bit from the bottom and has a long compression movement and thus acts upon the contact springs by merely a light pressure. Moreover, the surface of the press button head is comparatively wide and it is placed somewhere about the centre in the bottom, from where the distance to the table can never exceed half the distance from table and edge.

The switch hook key, however, instead of being provided with a press button, can have an appropriately fitted compression device, for instance consisting of a plate underneath the front part of the bottom plate or a frame surrounding the bottom plate, which diminishes the risk of its not being acted upon. The entire bottom plate may also be made mobile and act upon the contact springs, when pressed against the case.

The dial 13 is fitted in the bottom plate with the holes turned downwards. When the instrument is placed on the table, the dial thus becomes invisible and is well protected. Practically, this is of great advantage. The dial is the part which is most easily worn out and whose exterior is most easily damaged. Further, a visibly placed dial always accumulates dust, while, on the contrary, the instrument according to the invention has only a smooth surface of pressed material, which is very simple to keep free from dust. As the dial is placed at the bottom plate, it is, moreover, wholly protected against shocks. Then, too, it cannot be acted upon before the instrument is lifted from the table and thus is switched into a signalling position. As the dial must have a comparatively large diameter to accommodate finger holes of a sufficient size, and as, on the other hand, rather a large supporting surface for the instrument is required, the latter requirement may be fulfilled by the said arrangement, at the same time as the base of the instrument will obtain a much smaller and more elegant form than when the dial is placed above the same.

In this case the press button of the switch hook key passes through a hole in the centre of the dial.

The telephone instrument cord 14, which connects the instrument with the wall terminal box, is connected to the bottom plate and passes through an appropriately placed hole 15 in the case. All the devices and terminals with the exception of the receiver are thus mounted on the bottom plate, whereby an exceedingly simple and practical mounting and connection is effected. From the dial there are two wires leading up to the receiver.

As the devices of the instrument have been placed as low down as possible in the instrument, and, consequently, the centre of gravity lies low down, it is most convenient to hold the instrument by its lower part, while dialling and calling. For that reason the case has been formed so that the instrument may be held in easy comfortable grasp in the hand when applied over the lower part of the instrument. The upright 2 joins the base 5 forwardly of the rear end thereof and the shoulder 16 thus defined extends from side to side of the base and is sloped downwardly and rearwardly. Shoulder-like portions 16*a* continuing forwardly on the base from the shoulder 16 are disposed on opposite sides of the upright and this arrangement conforms closely to the shape of the cupped hand. With the instrument supported in normal upright position, the hand is applied in the position shown in Fig. 4*b* with the thumb and index finger gripping the bottom of the upright along the side flanges 16*a*, the palm resting flatwise upon the back shoulder 16 and the remaining fingers resting against the base below the index finger. In this manner the instrument may be picked up and held steady in an easy and comfortable grasp with only slight exertion. As the instrument is lifted, the switch hook key operates and switching takes place from signalling to speaking position. Then the instrument is inclined backwards as shown by Fig. 5. With the hand remaining clasped about the juncture of the base and upright in the manner above described, the instrument can be tilted into this dialing position by a simple turning movement of the forearm and thus firmly held against tendency to turn. The dialling tone, as a rule, is so powerful that the caller may hear it in this position without lifting the instrument to his ear.

As the upright of the instrument forms an oblique angle with the bottom surface, the dial comes into a good operating position for dialling with the right hand, when the instrument is thus inclined backwards. When the caller has dialed

the number required on the dial, he lifts the receiver to his ear without altering the position of the hand, whereby the mouthpiece comes into a convenient distance from the mouth. After the call, the instrument is replaced on the table, whereby the button of the switch hook key is actuated and the instrument is once more switched into signalling position.

To enable dialling by one hand only, the rear edge of the base is made straight and the back of the upright is flattened as shown in Figs. 8 and 9. By inclining the instrument backwards on the table as shown in Fig. 6, the instrument rests firmly on the edge 17 and the flat back of the upright with the dial turned obliquely forwards. In this position the number on the dial can be taken without taking hold of the instrument with the other hand.

It is also possible to place the instrument in this position, if, during a call, one should wish to lay aside the instrument without giving clearing signal to the exchange.

The devices which are not to be operated by the caller, viz. induction coil, transformer, signalling bell, etc., may appropriately be placed in the wall terminal box of the instrument. The latter should preferably be made as a shelf, where the instrument may be placed as shown in Figs. 7 and 8.

The devices are mounted on a frame, which should be screwed on to the wall and provided with terminals to which the incoming line and the instrument cord are connected. Over this frame the case 18 is slipped in shape of a shelf, preferably made of pressed material. As the instrument is provided with a rubber edge at the bottom there is no danger of its falling down from the shelf. If one should happen to knock against the instrument, it is prevented from falling as the flange 19 stays the inner part of the base, when the same is lifted.

During a call the instrument may be hung by the receiver lid in the recess 20 as shown by Fig. 9, whereby the switch hook key will not be acted upon and no clearing signal is sent to the exchange.

The shelf may be provided with a special holder 21 as shown by Fig. 10. There the instrument is placed upside down, whereby dialling may be made with one hand only if necessary.

By the said design of the wall terminal box the same instrument may be used both as a table and a wall instrument, and two different types of instruments are not any longer necessary. The instrument is consequently a universal instrument which, when required, may be used as a table instrument, but when an unoccupied table is desired, as a wall instrument, and so forth.

The instrument is, however, most convenient as an office, domestic instrument or the like as it requires but little space on the table. On account of its projecting receiver, it is very well adapted for use in systems, where signalling takes place by means of tone in the receiver. In such cases the special signalling bell is eliminated and the wall terminal box will only contain induction coil and condenser.

In the example of application an automatic instrument is shown. It is, however, evident that any types of instruments may be made without giving up the principle of the invention.

In a domestic telephone, for instance, there is no dial. As the instrument should be a cheap one, it is advisable to place all the devices required in the base of the instrument, whereby the



wall terminal box will only consist of a small connection box for the incoming line. If, in some cases, for example in a kitchen, a special shelf is desired, for placing the instrument as a wall instrument, one may arrange the dry battery inside the same.

If one wishes to arrange the instrument for line selection purpose, the push button operated key set should be mounted at the same place as the dial in the automatic instrument, whereby an exceedingly simple and efficient instrument will be obtained.

If one wishes to make the instrument in form of a magneto telephone a small magneto may be inserted into the base part, which, for instance, is actuated by a controlling device fitted on the upper side of the instrument.

It is furthermore evident that it is possible to have press buttons, tangents, visual indicators etc. inserted into the instrument according to need.

For a long time there has been a wish to obtain a telephone instrument which could be placed on the table in a position suitable for speaking and hearing, in order to have both hands free during the call. For this purpose the instrument is very well adapted as it is normally of the standing type. One just has to put the instrument in a convenient position without the switch hook key being actuated. Therefore the instrument may, for example, be provided with a supporting device which is fitted into the front part of the bottom plate and usually rests recessed into the same. When necessary, the supporting device is lowered, at which the instrument comes to rest thereon, and on the rear edge of the bottom plate, whereby the bottom plate is raised far enough up from the table so that the press button remains unpressed, receiver and microphone at the same time standing in a suitable position for hearing and speaking. A special stand may also be designed in which the instrument is placed and being so made that the press button remains unpressed.

We claim:

1. A telephone instrument comprising an upright, a base carried by and normally supporting the upright in an erect position, a forwardly facing ear piece at the upper end of said upright, a mouthpiece in the front part of said base, a switch in said base, a signalling device mounted in and accessible from underneath said base, a rear shoulder on the back of said base at its juncture with the upright forming a rest surface for the inside of the hand, and side shoulders continuing forwardly from the rear shoulder along the base on opposite sides of the upright, said shoulders and the contiguous portions of the base and upright constituting a hand grip for lifting and holding the instrument in various positions for signalling and talking, said signalling device being constituted by a dial and said switch being arranged centrally of the dial.

2. A telephone instrument comprising an upright, a base carried by and normally supporting the upright in an erect position, a forwardly facing ear piece at the upper end of said upright, a mouthpiece in the front part of said base, a switch in said base, a signalling device mounted in and accessible from underneath said base, a rear shoulder on the back of said base at its juncture with the upright, and side shoulders continuing forwardly from the rear shoulder along the base on opposite sides of the upright, said shoulders and the contiguous portions of the base

and upright constituting a hand grip for lifting and holding the instrument in various positions for signalling and talking, said base terminating at its rear end in a straight edge and said upright having a flat surface lying parallel to said edge whereby the instrument may be set in position on a support to afford access to said signalling device.

KNUT HUGO BLOMBERG.
RALPH ÅKE GÖSTA LYSELL.



## REFERENCES CITED

The following references are of record in the file of this patent:

### UNITED STATES PATENTS


| Number | Name | Date |
|---|---|---|
| 2,183,744 | Hubbell | Dec. 19, 1939 |
| 1,941,237 | Weeber et al. | Dec. 26, 1933 |
| 1,944,701 | Weeber et al. | Jan. 23, 1934 |