

1,305,237.

Patented May 27, 1919.

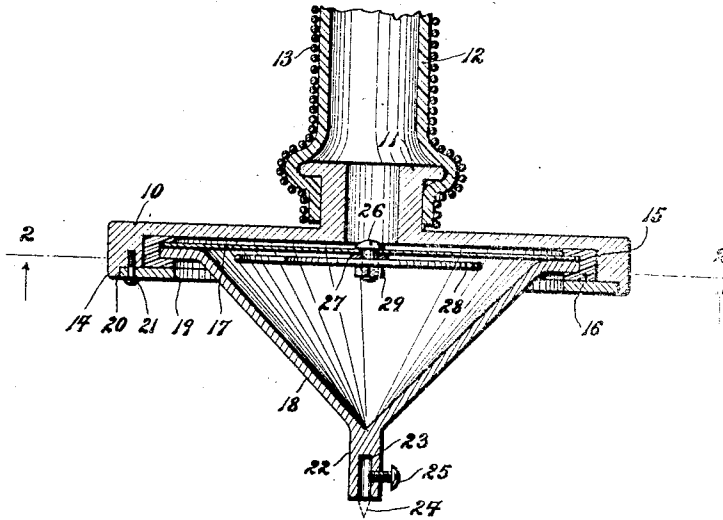


FIG. 1

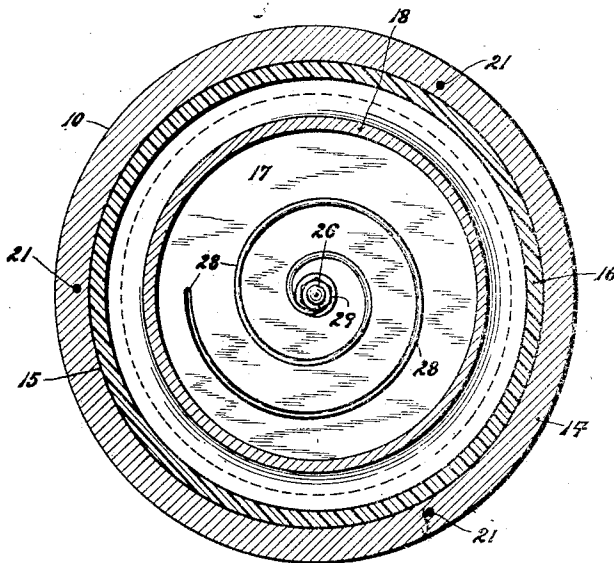


FIG. 2

Witness

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JOSEPH A. RAYDER, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-LOCATOR.

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To all whom it may concern:

Be it known that I, JOSEPH A. RAYDER, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Sound-Locators, of which the following is a specification.

The invention relates to devices for locating sounds, and to that class of stethoscopic devices adapted to the localization of sounds and noises and to this end the invention has for an object, the provision of a simple apparatus designed to be readily carried in a compact form and quickly arranged for application to various bodies or elements to transmit audibly to the ear of the user, any sounds or noises that may issue therefrom.

Although my device may be employed for various purposes, I particularly adapt it to water mains, conduits, and other ducts or forms of pipe for the conveyance of fluids as in the case of municipal water supplies, to the end that any leaks in a main or pipe may be readily and quickly located and thus save considerable time and labor in digging away or unearthing the surrounding structure to obtain access to the point of leakage for the purpose of repairing the same.

In the further disclosure of the invention, reference is to be had to the accompanying drawings, constituting a part of this specification, in which similar characters of reference denote corresponding parts in all the views, and in which,

Figure 1— is a vertical sectional view taken through the structure and

Fig. 2— is a cross sectional view taken on the line 2—2 in Fig. 1, looking in the direction of the arrows.

Referring more particularly to the views, the numeral 10 indicates the body, which may be of a circular or disk like construction, being formed at its central portion with a projecting tubular extension 11, provided for the application of a sound conveyer tube 12 to the body, said tube being held in applied position to the extension 11 by a suitable tube encircling spring 13, the free end of the tube (not shown) being adapted for connection with the ear in any suitable manner. The body 10 is formed with an annular flange 14 forming a recess 15 in which is disposed a circular non-metallic holding element or gasket 16, of a channel shape in cross section, the element serving to support and hold together a dia-

phragm 17 of a vibratory nature and a conical shaped head 18, the diaphragm 17 and head 18 being both of metallic construction and arranged to contact adjacent their respective peripheries. A circular plate 19 is seated in a recessed portion 20 of the flange 14 of the body 10 and is held therein by suitable screws 21, the said plate serving to secure and rigidly hold the element 16 in position and facilitate rigid contact between the diaphragm 17 and head 18. The head 18 is formed with an extension 22 which I might term the applicator or contact point, although it will be seen that the head is formed with a needle receiving opening 23 for securing an applicator or contact needle 24, by means of a screw 25, it being immaterial in certain instances as to which form of applicator may be employed.

Centrally of the diaphragm 17 there is arranged a screw or bolt 26, passing through the diaphragm and carrying a spacing washer 27, with the inner extremity of a helical vibrator or vibratory element 28 held rigidly upon the bolt by a suitable nut 29, as clearly shown in Figs 1, 2. It will be noted that the element 28 is absolutely spaced from the diaphragm and has absolutely no direct contact with the head 18, and it will of course also be seen that the diaphragm 17 is spaced from any direct contact with the body 10.

In the use of the device described, the ear piece or ear pieces of the tube 12 are suitably attached to the ear of the operator and either the applicator 22, formed with the head 18, or the needle 24 attached to the applicator 22, is placed against or in close contact with the particular body from which it is thought the tell tale sounds would be apt to emanate, the latter being the result of leakage or some foreign disturbance in or close to the body. By reason of the conductivity of sound, the disturbing noise will be transmitted to the head 18 and by reason of its peculiar formation and its direct contact with the diaphragm 17 the sound will be transmitted to the latter. This will bring about the vibration of the diaphragm, which in turn conducting the sound to the vibratory element 28 will cause the latter to be set into vibration and amplify the sound to an extent that will enable the ear of the operator to easily catch the sound as it is carried back through the diaphragm and through the tube 12 so that the operator after slight practice with the device and the

training of his ear to different sounds will be able to accurately judge and determine the meanings of the different sounds that he may hear and also determine at just about what distance they are from the device and in what locality the sounds are produced.

I have found from experience, that many if not all of the water mains and other forms of metallic supply pipes and other conduits, for the conveyance of fluids and gases, located in the ground, are to a certain if not material extent magnetized, either by the inherent magnetic flux of the earth, or by reason of some magnetic leakage from some other electrical source, and to this end I have discovered that by highly magnetizing the vibratory element 28, I obtain more efficient results with the use of my device in connection with pipes or conduits of this character.

Having described my invention, I claim,—

1. A sound locator comprising in combination with a body and a head, a circular grooved supporting element seated in the body and engaged by a portion of the head to hold the latter, a diaphragm seated in said supporting element and held thereby in contact with the head, means attached to the body and bearing against the supporting element to secure the same in place and facilitate direct contact of the head and the diaphragm, and vibratory means carried by said diaphragm.

2. A sound locator comprising in combination with a body and a head, a circular grooved supporting element seated in the body and engaged by a portion of the head to hold the latter, a diaphragm seated in said supporting element, means attached to the body and bearing against the supporting element to secure the same in place and facilitate direct contact of a portion of the head with a portion of the diaphragm, and vibratory means carried by said diaphragm, said means being spaced from the diaphragm and from said head.

3. A sound locator comprising a body formed with an internal recess, a circular supporting element in said recess, said element being of a non-metallic nature, a head having an annular edge thereof seated in said supporting element, a diaphragm having a circular portion adjacent its periphery in direct contact with the annular edge portion of the head, said diaphragm being also seated in said supporting element, and a plate securing said supporting element in said body and pressing upon said element to insure relative rigid contact of said head with said diaphragm.

4. A sound locator comprising in combination with a body and a head, a vibratory diaphragm and means supporting said head

and diaphragm in said body and in spaced relation to the latter and holding said head and diaphragm in contact along the outer edge of one with the outer edge of the other.

5. A sound locator comprising in combination with a body and a head, a vibratory diaphragm, means supporting said head and diaphragm in said body and in spaced relation to the latter and holding said head and diaphragm in contact along the outer edge of one with the outer edge of the other, and a vibratory element supported in said body in juxtaposition to said diaphragm.

6. In a sound localizer, the combination with a body, of a sound receiving and conveying head and a vibratory diaphragm, said head and diaphragm being both supported in said body in spaced relation to the latter.

7. In a sound localizer the combination with a body, of a sound receiving and conveying head and a vibratory diaphragm, said head and diaphragm being coöperatively supported in said body in spaced relation to the latter.

8. In a sound localizer the combination with a body, of a sound receiving and conveying head, a vibratory diaphragm and means relatively associated and supporting said head and diaphragm in said body in spaced relation to the latter.

9. In a sound localizer, the combination with a body, of a sound receiving and conveying head, a vibratory diaphragm, means relatively associating and supporting said head and diaphragm in said body in spaced relation to the latter, and a vibratory element carried by the diaphragm.

10. In a sound localizer, the combination with a body, of a sound receiving and conveying head, a vibratory diaphragm, means relatively associating said head and diaphragm in said body in spaced relation to the latter, and a vibratory element carried by the diaphragm and spaced therefrom and from said head.

11. In a sound localizer the combination with a body, of a head, a vibratory diaphragm and a vibratory element, said head, diaphragm and vibratory element being supported in said body in spaced relation thereto.

12. In a sound localizer, a body, a head, a diaphragm, means supporting said head and diaphragm in engaging relation in the body and in spaced relation to the latter and a vibratory element interposed between the head and diaphragm and held in spaced relation to said head, said diaphragm and said body.

In testimony whereof I affix my signature.

JOSEPH A. RAYDER.