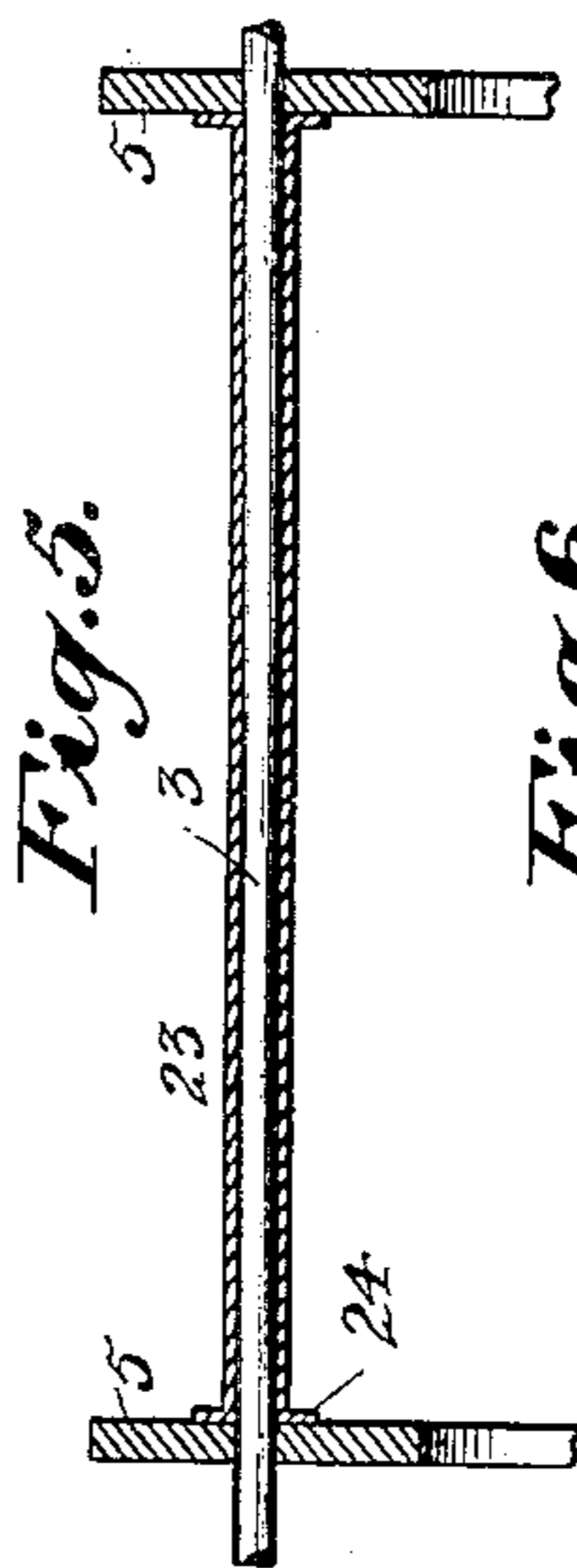
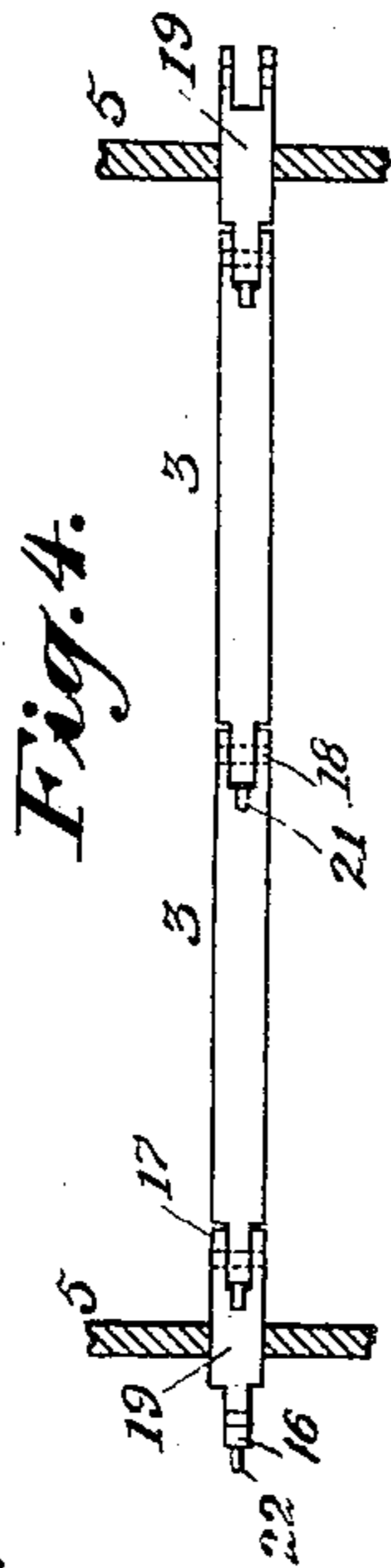
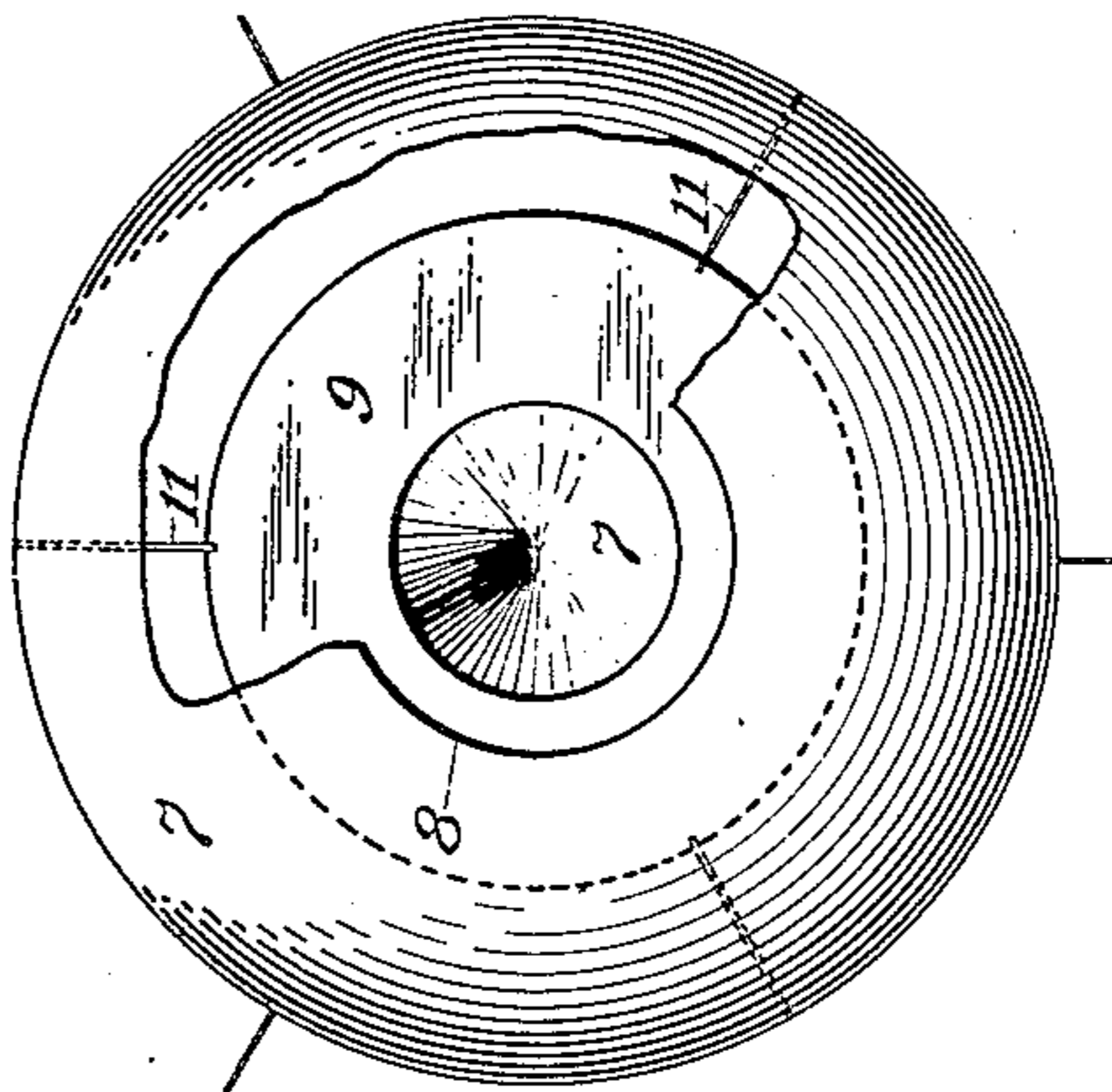
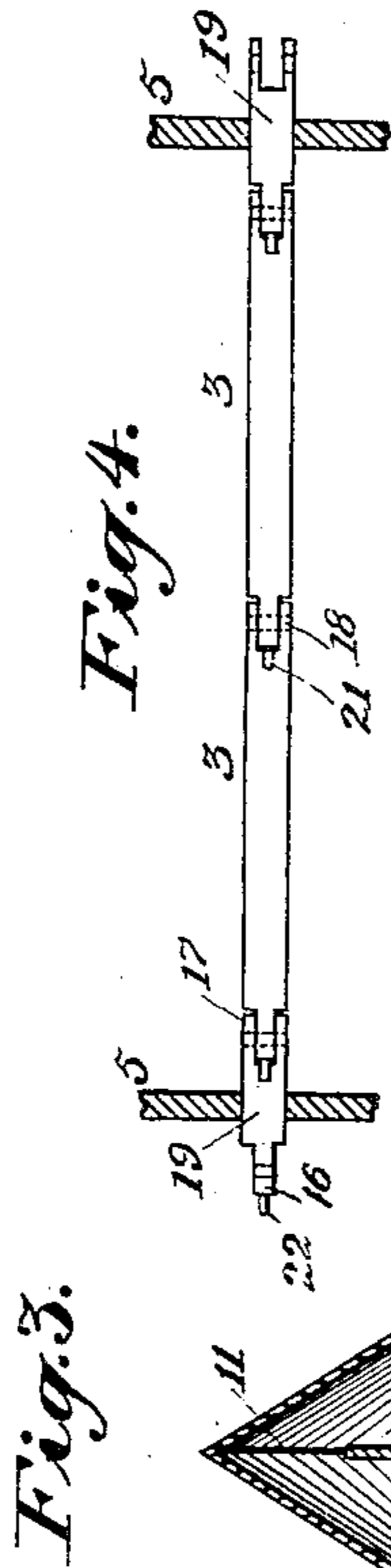
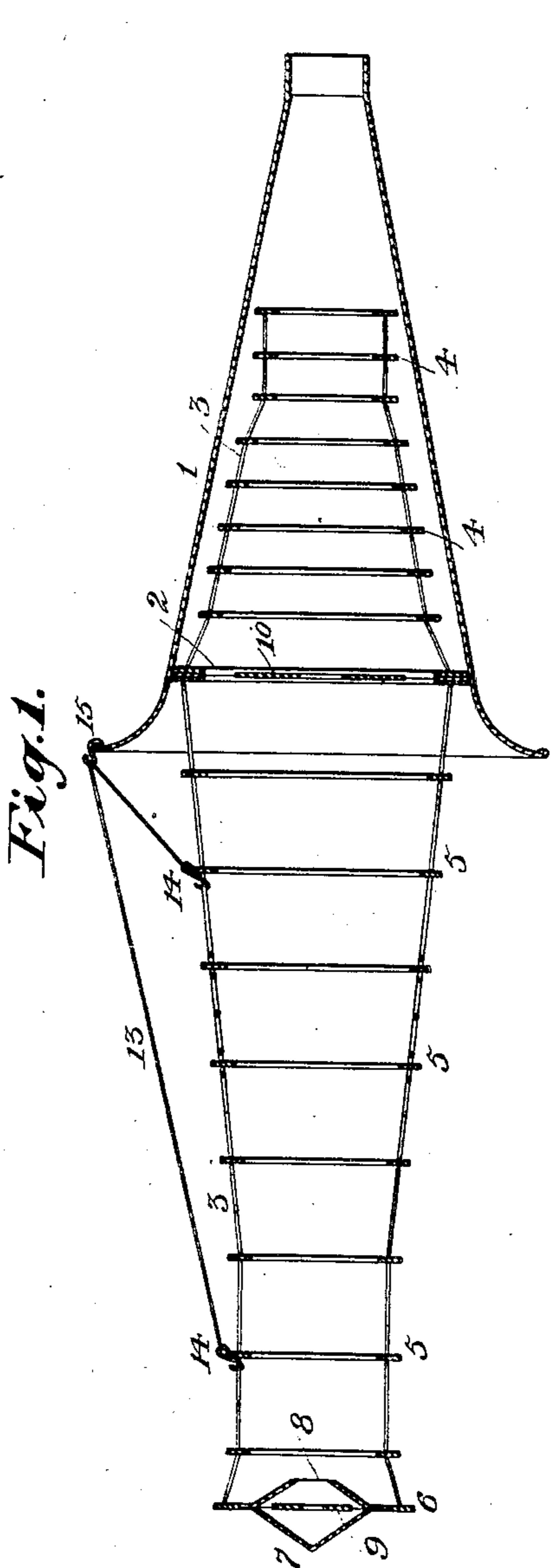


O. G. ROSE.  
ATTACHMENT FOR THE HORNS OF SOUND REPRODUCING INSTRUMENTS.  
APPLICATION FILED AUG. 28, 1907.

912,735.

Patented Feb. 16, 1909.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

OVEREND G. ROSE, OF CAMP MEEKER, CALIFORNIA.

## ATTACHMENT FOR THE HORNS OF SOUND-REPRODUCING INSTRUMENTS.

No. 912,735.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed August 28, 1907. Serial No. 390,558.

*To all whom it may concern:*

Be it known that I, OVEREND G. ROSE, a citizen of the United States, residing at Camp Meeker, in the county of Sonoma and State of California, have invented certain new and useful Improvements in Attachments for the Horns of Sound-Reproducing Instruments, of which the following is a specification.

My invention relates to attachments for the horns of sound-reproducing instruments, and in general character, construction and purpose resembles the device described in Letters Patent No. 842,707, granted to me January 29, 1907. In that patent I described a structure composed of a number of connected diaphragms, disks or rings, supported entirely within the horn and adapted to act both as sound projectors and as sound analyzers; the latter term being used to express such a separation or individualizing of the tones of different instruments, or of the voice and accompaniment, or of the solo and chorus whether vocal or instrumental as may be perceived in any original musical rendition. This kind of tone-analysis does not take place in the ordinary unobstructed horns; and so while such horns are necessary for amplifying and giving volume to the tones reproduced, those advantages are obtained at a considerable sacrifice of clearness and delicacy, owing to the production of what might be called "horn-tones" arising in the horn itself. The device described in the said patent was adapted to prevent the formation of such horn-tones and to give the clearness and delicacy of original tones to those reproduced as well as their harmonious shading and blending; but I have found that the devices which are the subject of the present application are still better adapted and still more effective for those purposes. It must not be understood from my use of the term "analysis" or "separation" that the sounds of different instruments are individualized to the detriment of harmony. What I mean is, that just as in the original rendition each kind of instrument has its own appreciable value, at least to a musician, and can be distinguished from the others without at all detracting from the combined harmonious effect; so when my attachment is employed the same instrumental value can be appreciated in the reproduction.

I have herein described a practical embodiment of my invention, and have illustrated the same in the accompanying drawings in which:

Figure 1 is a longitudinal section of an amplifying horn with my attachment in position. Fig. 2 is a rear elevation, partly broken away, of one of the suspended sound-chambers. Fig. 3 is a vertical section of the same. Fig. 4 is a detail view to show the joints by means of which the attachment can be made collapsible. Fig. 5 is a section to show a spacing sleeve between the disks or rings of the kind used when the frame of the attachment is not collapsible. Fig. 6 is a cross section through one of the rods of the frame and a surrounding spacing sleeve.

I have shown at 1 an amplifying horn, which is intended to be illustrative of the various kinds and shapes of horns used with sound-reproducing instruments, such as the ordinary horn of circular cross section, the flower-shaped horn etc. Supported by the horn and extending partly within and partly without the same is my attachment for projecting, analyzing and focusing the sounds reproduced. An annular disk 2 is held in the horn preferably by frictional contact, and is located within but in proximity to the rim or mouth. In order that it may be strong and rigid enough to act effectively as a supporting disk it is preferably formed of two, three or more separate disks, three being shown in the drawing, and such disks being connected together in any suitable manner. Passing through the disk 2 and extending from it in both directions, are wires or rods 3 of any suitable number, three being preferred and two being shown in the drawing. These rods or wires form a supporting frame for the series of disks or rings of which my attachment is composed. By reference to Fig. 1 it will be seen that a number of annular disks or rings 4 are spaced upon the rods 3, and that the greater number of such disks decrease progressively in exterior and also in interior diameter toward the smaller end of the horn, the last three of such disks being, however, preferably of the same diameter both externally and internally. All of the disks 4 although entirely within the horn, are supported out of contact with its inner surface.

Mounted upon those portions of the rods or wires 2 which project outside the horn are

other disks 5, which form a series the members of which for the greater part of its extent decrease progressively in both exterior and interior diameters as shown; the three disks nearest the end disk 6 being however preferably of the same diameters in both dimensions. It will also be observed that the disks 5 are spaced apart at a greater distance from each other than the disks 4. The distance apart of the disks 5 depends upon whether they are upon a scale of five, four, three or two inches, etc., to the foot while the disks 4 vary in their distance apart according to the size of the horn. The final disk 6 which is slightly larger than the disk adjacent to it, may be an imperforate disk like the end disk shown in my patent previously referred to; but I have found that a superior effect is obtained by making the said disk of annular form and suspending within it a focusing chamber 7. This chamber, which is shown in detail in Figs. 2 and 3, is composed of two cones placed base to base the inner cone being truncated and provided with a central opening 8. Suspension wires by which the chamber 7 is supported in the disk 6 are shown in Fig. 2. I prefer to suspend within the chamber 7 and in the plane of the conjoint bases of its two cones an annular disk 9 held in place by the wires 11. I may state at this point that the supporting disk 2 which is shown in Fig. 1 as provided with an interior annular disk 10, may instead be provided with one of the hollow focusing chambers; and also that any of the disks in either series 4 or 5 may be similarly provided.

In order to assist the disk 2 in supporting the projecting part of the attachment and to counteract the tendency to sag and bend which a long attachment may have, I have provided an auxiliary support consisting of a guy 13. This is a cord or wire having at each end a hook 14 and carrying an intermediate adjustable hook 15. The end hooks are engaged with one of the rods or wires 3 at convenient points, and the hook 15 is caught over the rim of the horn, so that the whole projecting part of the attachment is supported in its proper alinement with the horn.

In order that a very long attachment may be rendered more convenient for carriage and transportation, it may be made wholly or partly collapsible; and I have shown one means of accomplishing this in Fig. 4 and have also indicated such means between two of the disks 5 in Fig. 1. The rods 3 are made in sections having at their ends meeting tongues 16 and forks 17 hinged together by transverse pins 18. Each disk is mounted upon a similar but shorter pin 19. At the inner end of each fork is a recess 21, which receives a projecting stop 22 on the adjacent tongue, the construction being such that the joints will be stopped when the rods are

straight, but can be flexed in one direction so that the attachment can be folded together into small compass and brought within or near the mouth of the horn, the disks remaining in their proper planes but in close proximity to each other.

In order to keep the disks properly held and spaced upon the rods 3, I may provide such rods with collars or sleeves which may be strips of sheet metal formed into tubes and pinched or clamped upon the rods. Such a sleeve or collar is shown at 23 in Figs. 5 and 6 as extending from one disk to another and having end flanges 24. When the collapsible rods previously described are employed, such spacing collars or sleeves can also be used, although in that case they would be very short so as not to interfere with the working of the joints of the rods.

All the disks throughout the attachment can be made of any suitable material. I do not exclude metal for the purpose, but better results are obtained from disks of substantially non-resonant material and hence I prefer to use paper, paper-board, wood-fiber, wood itself, or other substances of that general character.

When the attachment is in place and the horn connected to the sound-reproducing instrument, the series of disks within the horn forms a compound diaphragm the members of which take up carry along or project the sounds so that they shall appear to originate at and proceed from the mouth of the horn instead of from its far interior. The amplifying effect of the horn is not interfered with, but with relation to what I have called horn-tones the disks have a silencing or neutralizing effect which entirely does away with the blurred or grating tones which are always to be perceived when horns of the ordinary kind are employed. The tones, thus purified, are delivered at the mouth of the horn and are then taken up, carried forward and analyzed by the exterior series of disks, the sound of each instrument being given off at the same relative distance from the sounds of the other instruments that it was when the piece was recorded, until the finer instruments such as the clarinet are finally focused and delivered at or from the focusing chamber 7. The arrangement of the external disks bears a definite relation to the arrangement which the musical instruments or voices bore to the recorder; and the analysis or separation of tones by the external disks can be readily demonstrated by listening close to and behind any of those disks. Thus the tones of an instrument which was located nearest the recorder, as a clarinet, can be clearly distinguished by listening in behind the chamber 7 or the disk next to it. In contrast with this trombone tones can be distinguished by listening in behind the external disk nearest the mouth of the horn. At

intermediate disks can be similarly distinguished tubas and altos, fifes and drums and other instruments. In songs and solo pieces, the human voice or the violin, mandolin, cornet, orchestra bells etc., are given off from the focusing-chamber 7, while the accompaniment is given off at or near the mouth of the horn, being separated from the voice or instruments a greater or less relative distance according as the disks 5 are made on the scale of five, four, three, two inches, etc., to the foot; the larger the scale the better being the results. Such separation of tones, thus capable of demonstration, is evidence of the fact that there is a real reproduction of the original with all its clearness and delicacy; while the projection of the tones outside the horn does away with any blurring or muffling effect of the latter. In this improved effect the two series of disks one within and the other without the horn both cooperate; the inner series acting to silence the horn-tones and to deliver pure tones to the outer series, and the latter taking up and projecting such pure tones and analyzing and separating them in the manner described so as to preserve their musical individuality and delicacy. I therefore prefer to use both series of disks; but as I have found in practice that it is possible to obtain very good tones when the external series is used alone, I do not wish to confine myself to the employment of both series in all cases. The reproduced tones thus individualized are focused at their respective rings by the end disk 7 and are delivered with all the harmony, purity and delicacy of the original rendition. The amplifying effect of the horn remains, but its blurring, muffling, and grating tendencies are removed, the tones as finally and externally delivered having been practically freed from what was objectionable in its influence.

I do not limit myself to the specific constructions and arrangements herein described and shown in the drawings, as I desire to avail myself of such modifications and equivalents as fall properly within the spirit of my invention.

What I claim is:

1. In combination with the horn of a sound-reproducing instrument, a plurality of connected annular disks supported by the horn and projecting beyond its mouth.

2. In combination with the horn of a sound-reproducing instrument, a plurality of annular disks connected together and supported partly within the horn and partly without the same.

3. In combination with the horn of a sound-reproducing instrument, a disk within and near the rim or mouth of said horn and in contact with its interior surface, and a series of disks connected together and to said first-named disk, one series extending into

the horn and the other extending outwardly from the horn.

4. In combination with the horn of a sound-reproducing instrument, a disk in contact with the inner surface of said horn near its mouth or rim, a series of disks within and out of contact with the horn connected together and to said first-named disk, and a series of disks outside the horn connected together and to said first-named disk.

5. In combination with a horn for the described purpose a supporting disk within the same near its mouth and in contact with its inner surface, a number of disks within the horn of progressively decreasing diameter connected together and to said supporting disk, and a number of disks without the horn and of progressively decreasing diameter, connected together and to said supporting disk.

6. An attachment for horns of the character described, having an annular supporting disk, a series of annular disks connected thereto and to each other and adapted to extend from said supporting disk within the horn, and a series of annular disks connected to the supporting disk and to each other and extending from the supporting disk to a point beyond the mouth of the horn; the disks of both series being of progressively decreasing diameters both exteriorly and interiorly.

7. An attachment for horns of the described character, having an annular supporting disk, a series of disks connected together and to said supporting disk and adapted to extend within the horn, and a series of disks connected together and to the supporting disk and extending to a point beyond the mouth of the horn; the disks of the inner series being closer together than the disks of the outer series.

8. In combination with the horn of a sound reproducing instrument, a structure composed of a plurality of annular disks connected together and supported by the horn; such structure being of such length relatively to the length of the horn that a part of it projects outside of the horn.

9. In combination with the horn of a sound reproducing instrument, a disk of such diameter relatively to the horn as to come into contact with its inner surface adjacent to its mouth or rim, and a series of disks connected together and to said first-named disk at one side of the latter, whereby said series of disks is caused to project outwardly from the horn.

10. In combination with the horn of a sound reproducing instrument, a disk of such diameter relatively to the horn as to come into contact with its inner surface adjacent to its mouth or rim, a series of disks connected together and to said first-named disk at one side of the latter, and a series of

disks connected together and to said first-named disk at the other side of the latter; whereby one series of disks is caused to extend outwardly from the horn and the other  
5 inwardly within the horn.

11. In an attachment of the character and for the purpose described, an annular disk, an open hollow sound chamber inclosed thereby, and a disk supported within the  
10 sound chamber.

12. In an attachment of the character and for the purpose described, an annular disk and a hollow sound-chamber within the same.

13. In an attachment of the character and for the purpose described, an annular disk, a hollow sound-chamber inclosed thereby, and an annular disk within said sound-chamber.  
15

14. In an attachment of the character described, an annular disk, and a hollow sound-chamber within the same; said chamber being of double conical form having one face truncated and provided with an opening.  
20

15. In an attachment for horns of the kind described, a plurality of disks, rods connecting said disks together, and joints in said rods whereby they can be flexed and straightened. 25

16. In an attachment for horns of the kind described, a plurality of disks, rods connecting said disks together, and spacing sleeves secured upon said rods adjacent to said disks. 30

17. In an attachment for horns of the kind described, a series of disks adapted to project beyond and outside of the horn, rods connecting said disks together, a guy connected to one of said rods, and an adjustable hook for connecting said guy to the horn. 35

In testimony whereof I have affixed my signature in presence of two witnesses, this  
fourteenth day of August, 1907. 40

OVEREND G. ROSE.

Witnesses:

JAMES J. BUNNER,

LAWRENCE B. SELENGER.