C. E. CROWE.

TRACHEAL TUBE.

APPLICATION FILED SEPT. 9, 1912.

**1,065,920.** Patented July 1, 1913.

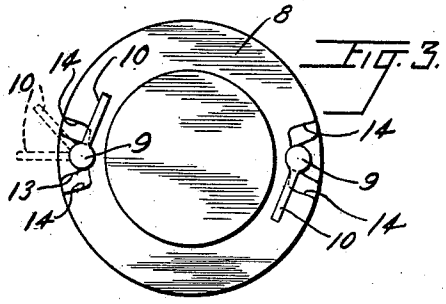



Fig. 3.

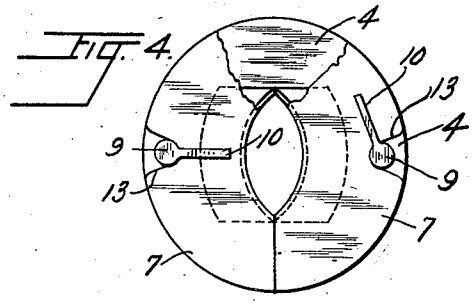



Fig. 4.

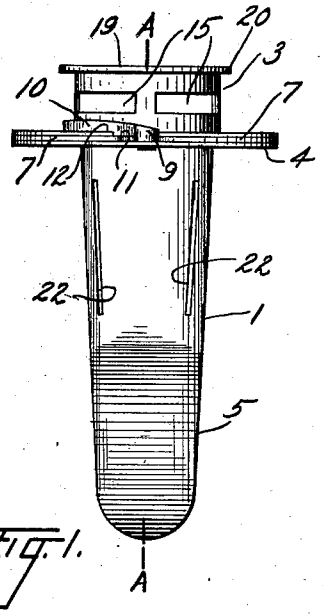



Fig. 1.

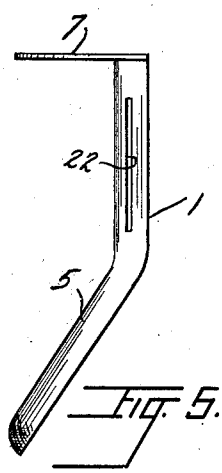



Fig. 5.

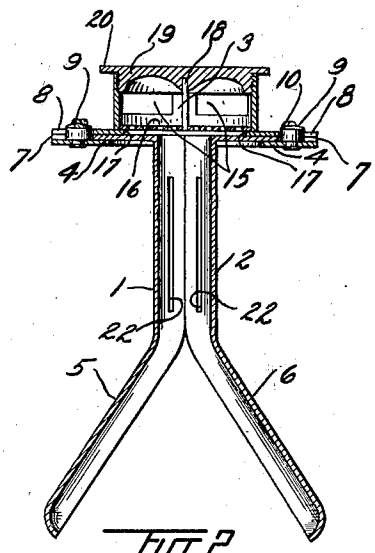



Fig. 2.
(A—A)

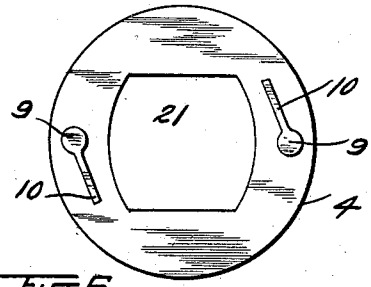



Fig. 6.

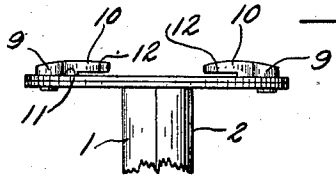



Fig. 7.

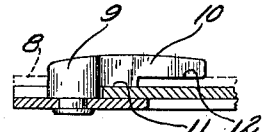



Fig. 8.

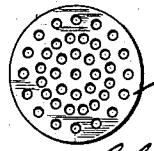



Fig. 9.

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# UNITED STATES PATENT OFFICE.

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## TRACHEAL TUBE.

1,065,920. Specification of Letters Patent. Patented July 1, 1913.

Application filed September 9, 1912. Serial No. 719,329.

*To all whom it may concern:*

Be it known that I, CHARLES E. CROWE, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Tracheal Tubes, of which the following is a specification.

The main objects of this invention are to provide an improved construction for tracheal tubes or roaring instruments adapted to be inserted into an incision, made in the neck of an animal, leading to the trachea or windpipe; to provide improved means whereby such an instrument may be so constructed that it may be quickly and easily assembled in the incision immediately upon the withdrawal of the knife used for making the incision; to provide improved means whereby the instrument may be assembled in sections and two or more sections locked in position so that the operator may have free use of both hands while assembling the parts; to provide an improved construction of tubes of this kind so as to provide when assembled an oblong section which will approximately conform with the shape of a straight incision between the cartilage rings of the trachea when spread out to admit the instrument; and to provide improved means whereby the possibility of injury by the spreading of the cartilage rings which make up the trachea is reduced to a minimum.

A specific embodiment of this invention is shown in the accompanying drawings in which—

Figure 1 is a side elevation of the instrument assembled and clamped together. Fig. 2 is a section of the same on the line A—A of Fig. 1. Fig. 3 is a plan view of the complete instrument showing in dotted outline the various positions of the clamping means as each successive section of the complete instrument is locked in position. Fig. 4 is a plan view of the instrument with the strainer cap or cage removed. Fig. 5 is a detail in elevation of one of the tube sections. Fig. 6 is a detail in plan of the retaining disk. Fig. 7 is a fragmentary detail of the retaining disk with both of the tube sections clamped thereto. Fig. 8 is an enlarged detail of the clamping means. Fig. 9 is a detail of the strainer.

In the construction shown in the drawings, the instrument comprises the split tube formed of the two tube sections 1 and 2 adapted to be clamped together and to the strainer cage by means of the retaining disk 4. The length of the shank of the tube sections 1 and 2 is substantially equal to the thickness of the flesh through which the incision is made, and the flared ends 5 and 6 secure the instrument against removal when assembled. The outer ends of the tube sections terminate in transverse flanges 7 which are clamped between the retaining disk 4 and the flange 8 on the strainer cage 3.

The clamping means comprise a pair of pins 9 pivotally mounted on the retaining disk 4 adjacent to the edge thereof at points diametrically opposite. Each pin 9 carries a wing 10. Shoulders 11 and 12 are formed on the under edge of the wings 10 which respectively engage the flanges 7 and 8. These flanges 7 and 8 are cut away adjacent to the pins 9 to form notches 13 and 14 respectively, and so formed as to allow the flanges to be passed down over said pins. The notches 14 are made considerably larger than the notches 13 so as to allow the shoulders 11 and 12 to engage the flanges 7 and 8 separately. Air is admitted to the tube through the apertures 15 and solid matter is prevented from entering the trachea by the perforated disk or strainer 16. The strainer 16 is seated in the cage 3 on the internal annular ledge or flange 17 and held in contact therewith by the pin 18 carried by the screw plug 19. The plug 19 has a knurled head 20. The hole 21 in the disk 4 is large enough to permit the bent tube sections 5 and 6 to be easily slipped into and out of place.

The operation of the device shown is as follows: One of the tube sections is inserted through the aperture 21 into the retaining disk 4 and clamped thereto by the engagement of the shoulder 11 on the wing 10 with the adjacent edge of the flange 7. The tube section is then pushed into the incision made in the neck of the animal to be treated. The other tube section is inserted through the aperture 21 and pushed into the incision and clamped to the disk 4. In clamping the tube sections to the disk 4 the wings 10 are turned to the position indicated by dotted outline in Fig. 3, so that the shoulders 11 engage the outer edges of the flange 7 adjacent to the notches 13. The strainer cage 3 is then placed in position with the notches 14 straddling the pins

9, and the wings 10 are turned farther inward so that the shoulders 12 engage the adjacent edge of the flange 8, and the parts are then all secured together and the entire operation has consumed but a few seconds. The ability to clamp two or more parts securely together permits the operator to temporarily release the assembled parts from his grip at any time and have free use of his hands. The instrument is taken apart in the reverse order to that in which it was assembled.

The strainer 16 may be removed from the cage 3 to facilitate cleaning, by unscrewing the plug 19 which withdraws the pin 18 from being in contact with the strainer, and when the plug is withdrawn the strainer 16 will drop out. The slits 22 in the tube provide for discharge of secretions which form in the wound. The fact that air is admitted through side apertures 15 instead of through a front aperture prevents the animal from stifling itself by leaning against an adjacent object such as the edge of a feeding trough.

In prior constructions, tracheal tubes have been made up of a pair of tube members each having at its inner end a lip flared away from the lip on the other, but in such constructions one of the tubes fits within the other at the outer end. In such case, in order to enable the inner bent tube to be passed through the outer tube, it has been necessary to so design the tubes that at their outer ends they would be substantially circular in cross section, and when inserted into the animal's trachea would have an extremely short tubular neck, frequently too short to enable the device to be inserted into a swollen throat. The present construction, being split throughout its entire length, has the advantage of being capable of having a shank or neck of indefinite length and at the same time of having its transverse cross section of flat elliptical form conforming approximately to the shape of a knife slit made between the cartilage rings of the animal's trachea. The aperture 21 in the disk 4 is made larger than the outside form of the tube sections so as to enable the tube sections to be freely passed through it.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:—

1. In a device of the class described, the combination of a disk having a central aperture therein, a pair of tube sections adapted to be inserted through said aperture, one at a time, each of said tube sections having a transversely disposed flange at its upper end adapted to rest on the upper face of said disk, a strainer cage having an annular flange adapted to be mounted on said transversely disposed flanges, and means for successively clamping said tube sections and cage together.

2. In a device of the class described, the combination of a disk having a central aperture therein, a pair of tube sections adapted to be inserted through said aperture, one at a time, transversely disposed flanges on said tube sections for limiting the movement of said tube sections through said aperture, a strainer cage adapted to be mounted on said flanges, and means mounted on said disk for clamping said tube sections and said strainer cage together, said strainer cage comprising an annular flat plate having a central opening connecting with the aperture in said disk, a central raised tubular section surrounding said opening, a strainer mounted in said tubular portion above the plane of said plate, said tubular portion having a side port communicating with the exterior thereof to permit the passage of air to said tube sections.

3. A tracheal tube comprising a retaining disk having a central aperture and oppositely disposed notches adjacent the periphery thereof, a pair of tube sections of semi-circular form adapted to be inserted into said aperture, each of said tube sections being flared at one end and having a transversely disposed semi-circular flange at the opposite end, said tubes being adapted to have abutting longitudinal edges when assembled in said retaining disk to form a channel throughout the greater part of the length thereof, each of said flanges having oppositely disposed notches adjacent the periphery thereof, and having edges adapted to abut each other in the same plane to form a circular disk for limiting the passage of said tube sections through said aperture, a strainer cage having an annular flange adapted to be mounted on the upper faces of said flanges, and means mounted on said retaining disk and extending through said notches for clamping said retaining disk, said tube sections, and said strainer cage together.

4. A tracheal tube comprising a retaining disk having a central aperture therein and clamping wings mounted thereon, a pair of tube sections adapted to be inserted through the aperture in said retaining disk, flanges on said tube sections for limiting the movement of said sections through said aperture, and a strainer cage adapted to be mounted on said tube and bearing against the flanges on said sections, said wings being adapted to be shifted to successively clamp each of said tube sections and said strainer cage together.

5. A tracheal tube comprising a retaining disk having a central aperture therein

and clamping wings mounted thereon, a pair of tube sections adapted to be inserted through the aperture in said retaining disk, flanges on said tube sections for limiting the movement of said sections through said aperture, and a strainer cage adapted to be mounted on said tube and bearing against the flanges on said sections, said wings being adapted to be shifted to successively clamp each of said tube sections and said strainer cage together, said strainer cage comprising a casing having a strainer therein, and a plurality of spaced openings adapted to permit the passage of air through said strainer into said tube sections.

6. A tracheal tube comprising a retaining disk having a central aperture therein and clamping wings mounted thereon, a pair of tube sections adapted to be inserted through the aperture in said retaining disk, flanges on said tube sections for limiting the movement of said sections through said aperture, a strainer cage adapted to be mounted on said tube and bearing against the flanges on said sections, and stepped shoulders on said wings adapted to bear against said flanges and successively clamp said tube sections, and said strainer cage together and to said retaining disk.

7. In a device of the class described, the combination of a retaining disk and a strainer cage having centrally located apertures therein, a pair of semi-circular tube sections adapted to be inserted through the aperture in said retaining disk, and having transversely disposed flanges at the upper ends thereof adapted to abut each other in the same plane and to be secured between said retaining disk and said strainer cage, and means mounted on said retaining disk for clamping said flanges between said retaining disks, said strainer cage comprising an annular flange having a central aperture therein, a tubular raised portion having a series of spaced openings therein mounted adjacent the inner edge of said flange and surrounding said aperture and adapted to divide said flange into inner and outer flanges, and a strainer mounted in said raised portion and seated on said inner flange.

8. In a device of the class described, comprising a strainer cage, a retaining disk having a centrally located aperture therein, a pair of tube sections having transversely disposed flanges at one end and being outwardly flared at the other end, and adapted to be inserted through said aperture in said retaining disk, clamping means on said retaining disk for rigidly locking said tube sections together and between said retaining disk and said strainer cage, said clamping means comprising a pair of pins oppositely disposed to each other and pivotally connected to said retaining disk, a pair of wings adapted to be shifted toward and away from the axis of said retaining disk, and shoulders on said wings for the purpose specified.

9. In a device of the class described, comprising a strainer cage, a retaining disk having a centrally located aperture therein, a pair of tube sections having transversely disposed flanges at one end and being outwardly flared at the other end and adapted to be inserted through said aperture in said retaining disk, clamping means on said retaining disk for rigidly locking said tube sections together and between said retaining disk and said strainer cage, said clamping means comprising a pair of pins oppositely disposed to each other and pivotally connected to said retaining disk, a pair of wings adapted to be shifted toward and away from the axis of said retaining disk, and shoulders on said wings, each of said tube sections having the flanges cut away at oppositely located points to provide notches for said pins, said strainer cage being cut away at oppositely located points to provide notches for said pins and to provide clearance for the shoulders on said pins, for the purpose specified.

10. In a tracheal tube adapted to be assembled into an incision made in the neck of an animal, the combination of a retaining disk having a central aperture therein, a pair of semi-circular tube sections having longitudinal abutting edges, and adapted to be inserted through the aperture in said retaining disk into such incision, one at a time, and mounted together to provide an air channel between each of said sections having its outer end flared to provide means for retaining said section in said incision when in assembled position, each of said sections having also a semi-circular transversely disposed flange at its inner end adapted to bear against said retaining disk for limiting the passage of said section through said disk, a strainer cage having an annular flange adapted to bear against said flanges of said tube sections, and means mounted on said retaining disk for successively locking said tube sections and said strainer cage together in assembled position, said strainer cage comprising annular inner and outer flanges having a central raised portion mounted adjacent the inner edge of said flange and a strainer seated on said inner flange within said raised portion, said raised portion having a series of spaced openings therein communicating with the exterior thereof, adapted to provide an air passage through said tube sections into the trachea of said animal for the purpose specified.

11. In a device of the class described comprising a retaining disk having a central opening, a pair of tube sections adapted to

be inserted in said opening and mounted together in opposed position to provide an air inlet channel between them, each of said sections being flared at one end and having a transversely disposed semi-circular flange at its opposite end, said flanges being adapted to abut each other in the same plane and bear against the inner face of said retaining disk, each of said flanges having also oppositely located notches adjacent the periphery thereof, a strainer cage mounted on said flanges and adapted to bear against the upper faces thereof, said strainer cage having oppositely located notches adjacent the periphery thereof, pins pivotally mounted on said retaining disk and extending upwardly through said notches, wings on said pins adapted to be shifted toward and away from the axis of said retaining disk for successively clamping said flanges on said tube sections and said strainer cage together, said strainer cage comprising a flat disk having a central opening therein communicating with said channel, a removable strainer for said opening, a central raised portion mounted thereon adjacent the inner edge of said disk and surrounding said opening and said strainer, said central portion having spaced openings in its side walls to provide an air passage through said strainer and said opening and communicating with the air channel in said tube sections, a closure for said central raised portion, and means mounted on said closure and bearing against said strainer for rigidly supporting said strainer in position, for the purpose specified.

12. A device of the class described comprising a retaining disk having a central opening, a pair of tube sections having transversely disposed flanges and adapted to be inserted through said opening and mounted therein to provide an air channel between, a strainer cage having a central aperture therein and a central raised portion surrounding said opening and adapted to provide an inner flange and an outer flange, a strainer for said strainer cage mounted on said inner flange and spaced away from the plane of said inner flange, and means mounted on said retaining disk for rigidly clamping said retaining disk, said flanges on said tube sections and said strainer in position, said central raised portion having a series of spaced ports in its outer walls opening into the exterior thereof and adapted to provide an air passage communicating with said air channel through said strainer.

Signed at Chicago this 3rd day of September, 1912.

CHARLES E. CROWE.

Witnesses:
CHARLES S. COLE,
JANE BURT.

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