

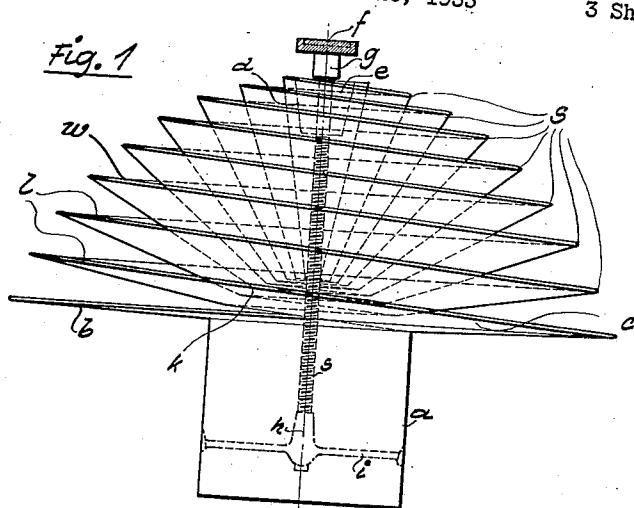
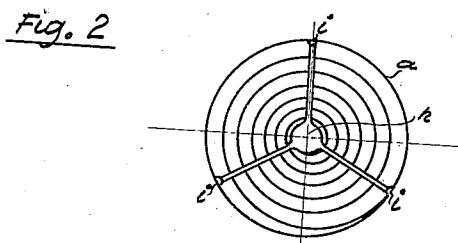
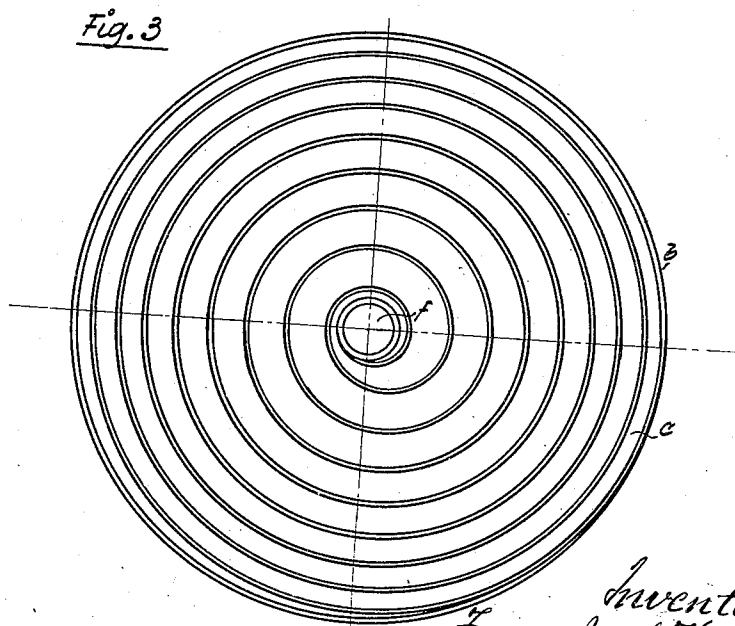
Sept. 12, 1933.

F. J. KURTH ET AL
AIR AND GAS DISTRIBUTING DEVICE

1,926,778

Filed Jan. 25, 1933

3 Sheets-Sheet 1



Inventors:
Franz Josef Kurth
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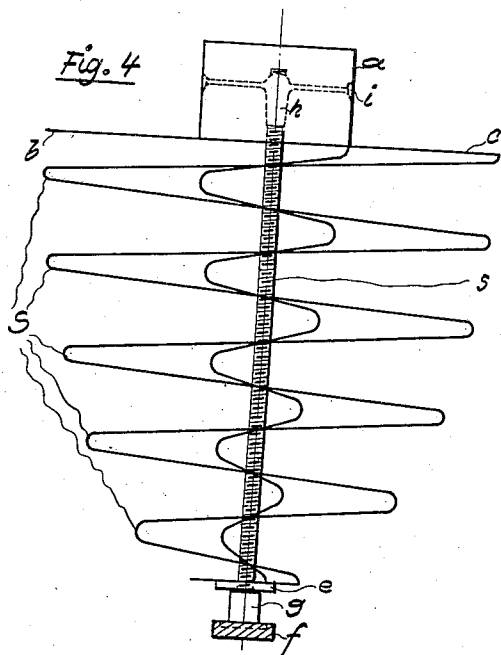
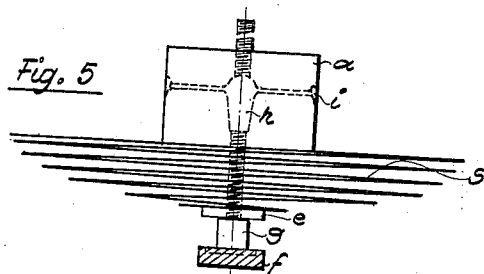
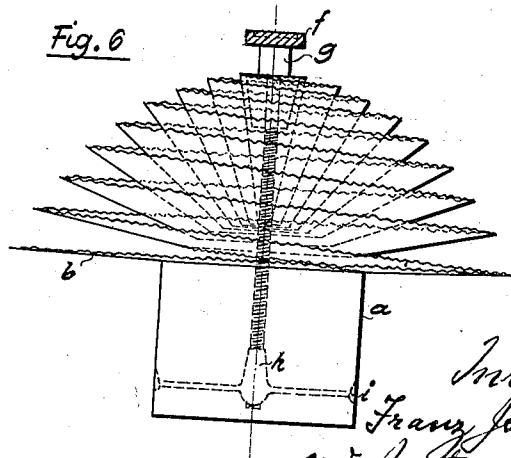
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3 Sheets-Sheet 2



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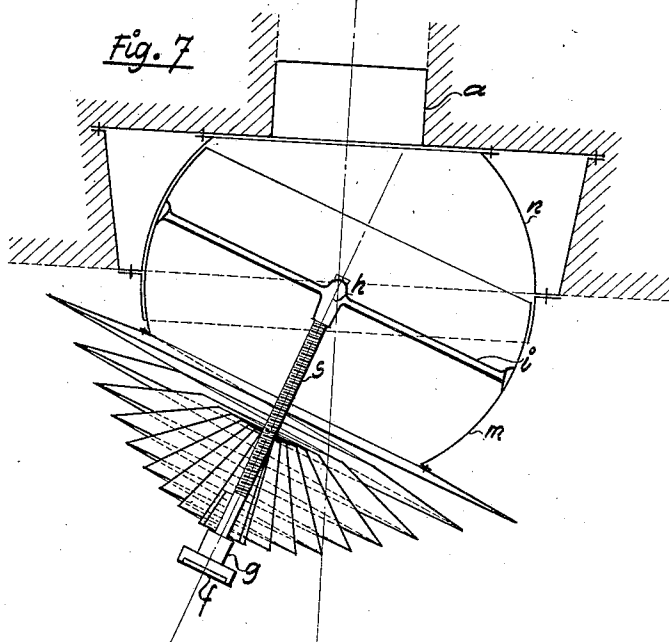
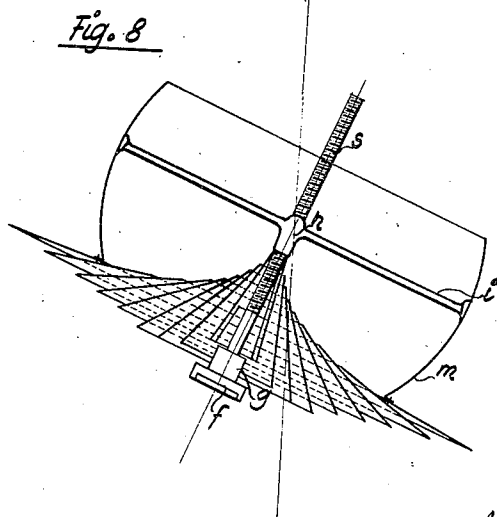
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AIR AND GAS DISTRIBUTING DEVICE

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Filed Jan. 25, 1933

3 Sheets-Sheet 3



Inventors:
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UNITED STATES PATENT OFFICE

1,926,778

AIR AND GAS DISTRIBUTING DEVICE

Franz Josef Kurth, Cologne-Dellbrück, and
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Sassenberg assignor to said Kurth

Application January 25, 1933, Serial No. 653,408,
and in Germany March 14, 1932

11 Claims. (Cl. 98—40)

This invention relates to air and gas distributing devices, and one object of the invention is to provide an improved device for this purpose.

According to the invention there is provided an air and gas-distributing device comprising a distributing element in the form of a spiral band which has its turns opposed to one another and spaced apart to provide between them through-
way passages for the air and gas of gradually increasing volume towards their outlet ends so as to effect a reduction in the velocity of the flow flowing through the distributing element.

The spiral band may be formed in any manner which will produce the desired effect. For instance, the opposed faces of the spiral band may be inclined or normal to its axis. If desired, in the former case the turns of the spiral band may be so arranged that the inclination of its opposed faces decreases from the outer to the inner turns of the band, and in the latter case the width of the band may increase from one end to the other.

According to one feature of the invention the spiral band is corrugated transversely, thus providing a larger surface area and an increased resistance to the flow of the fluid. This enables the distributing element to be made of smaller dimensions for a given velocity reduction than is the case when a plain spiral band is employed.

When a number of air and gas distributing devices are arranged in proximity on a single distribution pipe line, the devices will generally be of the same size for the sake of presenting a uniform appearance. In such cases, hitherto in order to regulate the quantity of air or gas issuing from each distributor, a separate controlling device has been required for each distributor. This may be a valve arranged in the branch pipe leading from the main distribution line to the distributor. Even in the case of distributors fed from separate supply pipes, regulation of the quantity of air or gas issuing from one or more of the distributors is frequently desirable.

Another object of the invention is to provide means whereby the quantity of air or gas issuing from the distributing device can be regulated without necessitating the provision of a separate controlling device.

With this object in view, the invention also provides means for adjusting the turns of the spiral band relative to one another in such a way as to control the passages between them.

Any convenient means may be provided for this purpose, for instance means arranged to move the inner margins of the turns of the spiral band towards and away from one another to

vary the area of the inlet into the distributing element.

Air and gas distributing devices are known, for example for introducing air into a room, which comprise a number of conical or other funnel-like partitions arranged one within another to provide a number of separate throughway passages which each increase in cross sectional area from their inlet to their outlet ends. It will be appreciated that the distributing devices according to the present invention may be regarded as modifications of these known constructions, inasmuch as the spiral band may be considered as a continuous partition which provides between opposed faces of its turns, throughway passages of gradually increasing volume towards the outer edges of the turns of the spiral band.

The above and other features of the present invention which relate to constructional details will now be more fully described with reference to the accompanying drawings which show by way of examples several constructions according to the invention.

In the drawings:—

Figure 1 is a sectional elevation of one construction,

Figure 2 is an underside view of the inlet to the distributing element,

Figure 3 is a plan of the distributing element,

Figure 4 is a sectional elevation of a second construction showing the distributing element in the fully open position,

Figure 5 is a similar view to Figure 4 but showing the distributing element closed,

Figure 6 is a sectional elevation of a third construction,

Figure 7 is a sectional elevation of a distributing device which is angularly adjustable relative to the inlet conduit with the distributing element shown in the open position, and

Figure 8 shows the distributing element of Figure 7 in the closed position.

All the drawings are diagrammatic, and like reference characters indicate like parts throughout.

According to the construction shown in Figures 1, 2 and 3, the air or gas to be distributed is led from any convenient source of supply to an inlet conduit *a* which communicates with a distributing element in the form of a spiral band *S* which preferably is of uniform or substantially uniform thickness and width throughout or substantially throughout its length. Surrounding the mouth of the inlet conduit *a* is a dish-shaped annular plate *b* to which outer end of

the spiral band *S* is anchored at *c*. The opposed faces of the turns of the spiral band are inclined to the axis of the distributing element and this inclination decreases from about 80°-10° in the direction from the outer to the inner turns of the band.

A spider *i* having a centrally arranged screw-threaded socket *h* is provided in the inlet conduit *a* and is engaged by a screw-threaded spindle *s*. The inner end *d* of the spiral band *S* has fixed thereto a hollow member *e* through which the spindle *s* loosely extends, said spindle being provided with a milled disc *f* effecting rotation thereof. A spacing sleeve *g* is provided between the member *e* and the milled disc. Obviously the sleeve *g* may form part of the milled disc or may be a separate element. In this construction the turns of the spiral band are so arranged that the inner edge of the band, in projection upon a plane at right angles to the axis of the distributing element, forms a flat spiral.

The air or gas supplied to the inlet conduit *a* flows through the passages between the turns of the spiral band *S* and as those passages gradually increase in volume in the direction of flow, the velocity of the flow is reduced. In Figure 1 the distributing element is shown in its fully open position. On screwing the spindle *s* through the boss *h*, pressure is exerted by the milled disc *f* through the sleeve *g* against the member *e* fixed to the inner end of the spiral band and thereby the turns of the spiral band *S* will be caused to telescope and the inner marginal edges *k* of said turns will move towards one another, thus throttling the inlets to the passages between the turns of the spiral band. By this means the quantity of air or gas flowing through the distributing element can be regulated at will.

On turning the spindle *s* in the reverse direction the spiral band reassumes its former position due to its resiliency. If necessary, in order to increase the resiliency of said band and according to a further feature of the invention, the outer marginal edge of the band may be formed with a bead in which is inserted a reinforcing wire, for example a steel wire, as indicated at *w* in Figures 1 and 3 of the drawings.

The means for regulating the quantity of air or gas flowing through the distributing element is not an essential feature of the invention and may be dispensed with if desired. In that case, any convenient means may be provided for holding the turns of the spiral band in position. For instance, there may be a rod connecting the end *d* of the spiral band to the spider *i*, or alternatively the inner edges *k* or the outer edges *l* of the turns of the spiral band may be connected together by a number of wire rods in the same way as the separate conical partitions of the known devices referred to above are held in position.

Figures 4 and 5 show a construction which in the open position effects only a slight reduction in the velocity of the air or gas. In this construction the opposed faces of the turns of the spiral band are normal to the axis of the distributing element. The band decreases in width from the anchored end *c* and is arranged to be adjusted to regulate the quantity of fluid flowing through the distributor by the means described with reference to Figures 1 to 3 inclusive.

Figure 6 shows a construction similar to that of Figure 1 but with the opposed faces of the spiral

band corrugated transversely for the purpose hereinbefore described.

Figures 7 and 8 show a construction comprising means to permit the distributing element to be angularly adjusted relatively to the inlet conduit *a*. In this construction the spider *i* is carried by a spherical shell *m* which is rotatably mounted within a similarly shaped casing *n* surrounding the mouth of the inlet conduit *a*. By closing the turns of the spiral together and adjusting the distributing element to the position shown in Figure 8 it is possible to reduce the quantity of fluid issuing from the distributor to an almost negligible quantity.

The invention is not restricted to the specific embodiments described as changes can be made therein without departing from the invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of overlapping convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to their substantially common axis towards the outer end of the strip, a major portion of the axial dimension of the innermost convolution being overlapped by a plurality of the next succeeding larger convolutions.

2. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of overlapping convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to their substantially common axis towards the outer end of the strip, each of a plurality of the convolutions of the device having major portions of their axial dimensions overlapped by the next succeeding larger convolution.

3. An air or gas distributing device as set forth in claim 1 in which the strip is of uniform width and thickness.

4. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, and means for adjusting the convolutions to vary their angularities.

5. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, and means for telescopically adjusting the convolutions to vary their angularities.

6. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, and screw means for adjusting the convolutions to vary their angularities.

7. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having

their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, a screw threaded member fixed with respect to the outer end of the strip, a stem substantially axially aligned with the convolutions and having screw threaded connection with said member whereby rotation of the stem effects longitudinal movement thereof, and a connection between said stem and the inner end of the strip whereby the convolutions of the strip are telescoped into one another to decrease their angularity when the stem is rotated to effect inward longitudinal movement thereof.

8. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, a longitudinally adjustable stem axially aligned with the convolutions of the device, and a connection between said stem and the inner end of the strip whereby inward longitudinal adjust-

ment of the stem effects telescopic adjustment of the convolutions into one another.

9. An air or gas distributing device comprising a strip of sheet material spirally wound to provide a plurality of nested convolutions having their axes disposed in substantially the same straight line, said convolutions being disposed at progressively increasing angularities with respect to the axis of the device towards the outer end of the strip, a hollow member fixed to the inner end of the strip, a screw threaded member fixed with respect to the outer end of the strip, a stem extending loosely through said hollow member and having screw threaded connection with said screw threaded member, and an abutment on said stem engaging the outer end of said hollow member.

10. An air or gas distributing device as set forth in claim 1 in which the strip is transversely corrugated.

11. An air or gas distributing device as set forth in claim 1 in which a strip reinforcing wire is fastened to and extends along the outer edge of the strip.

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