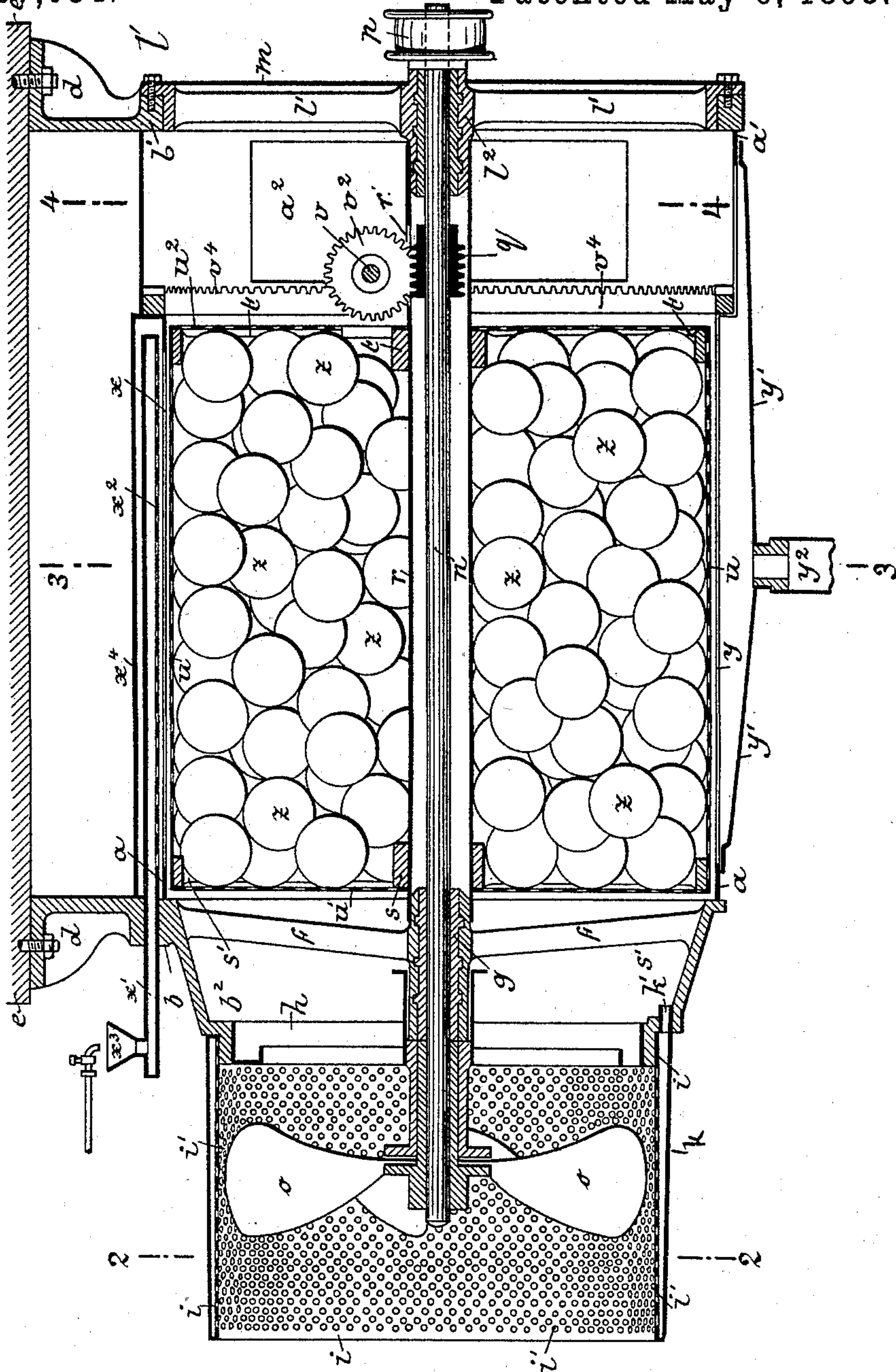


A. SCHMID.  
AIR MOISTENING APPARATUS.

No. 497,034.

Patented May 9, 1893.

Fig. 1.



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(No Model.)

3 Sheets—Sheet 2.

A. SCHMID.  
AIR MOISTENING APPARATUS.

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Fig. 2.

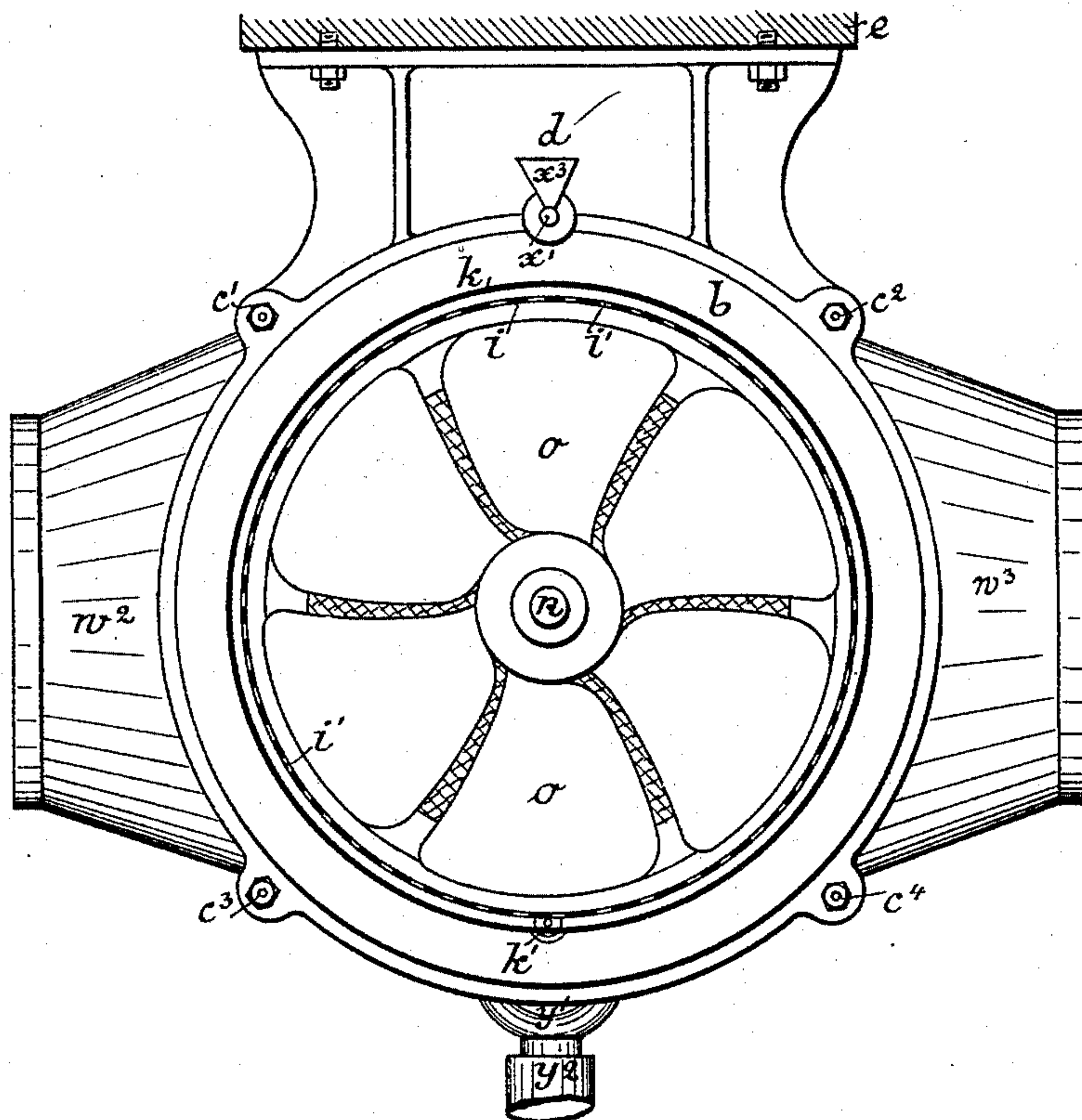
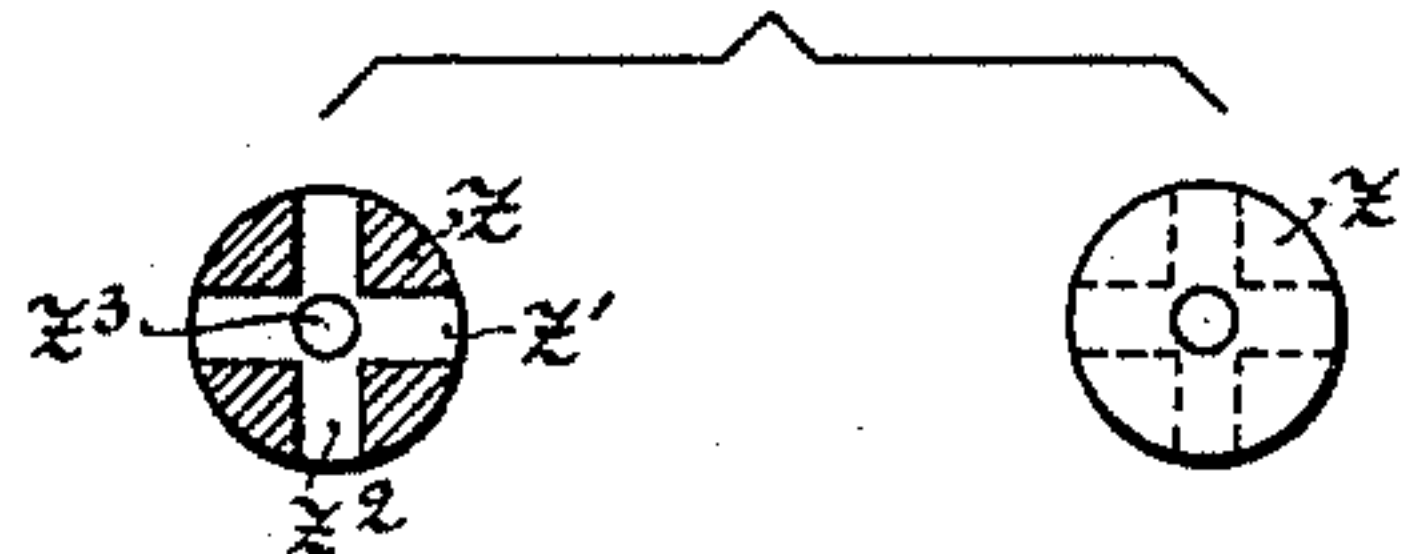


Fig. 5.



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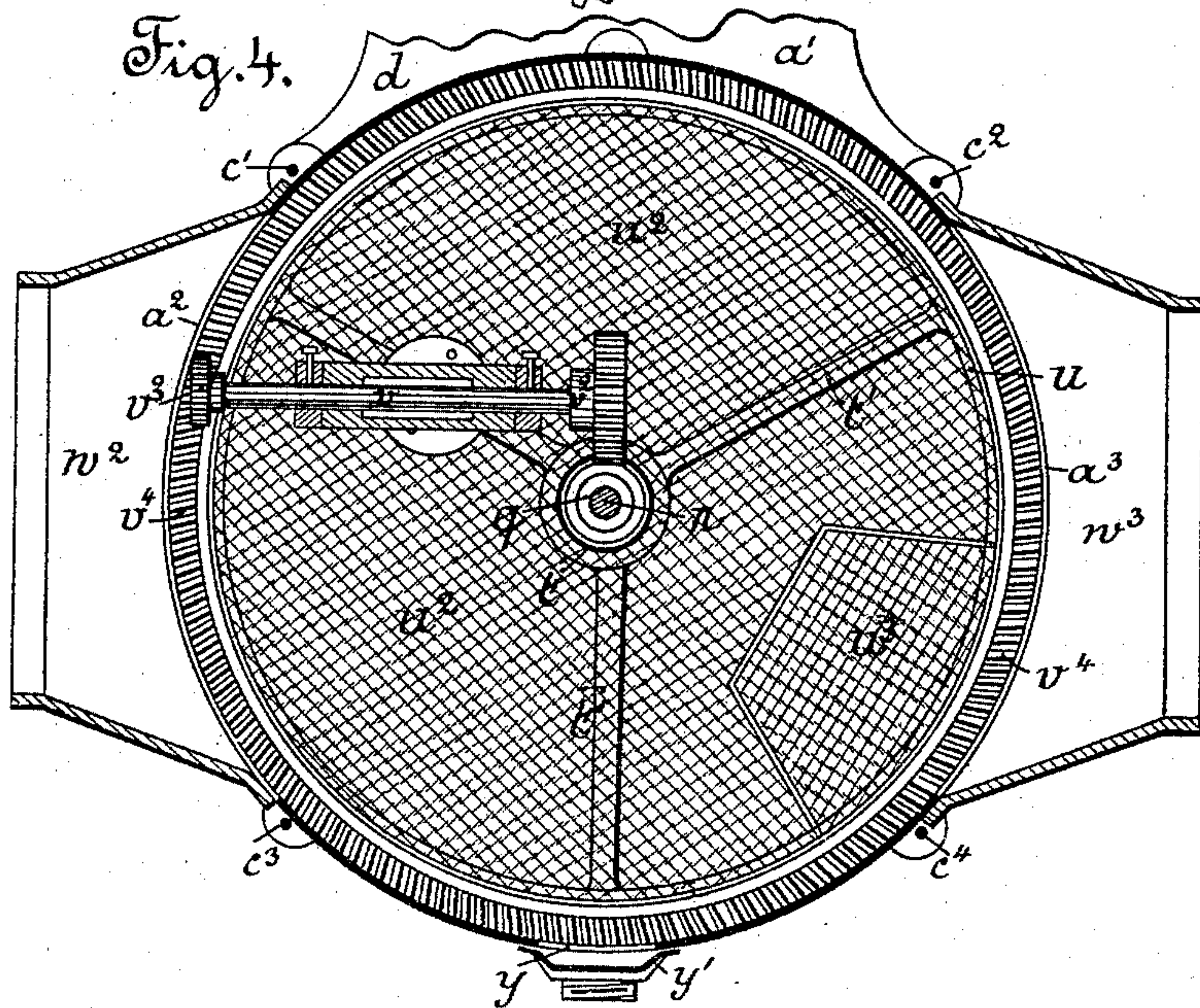
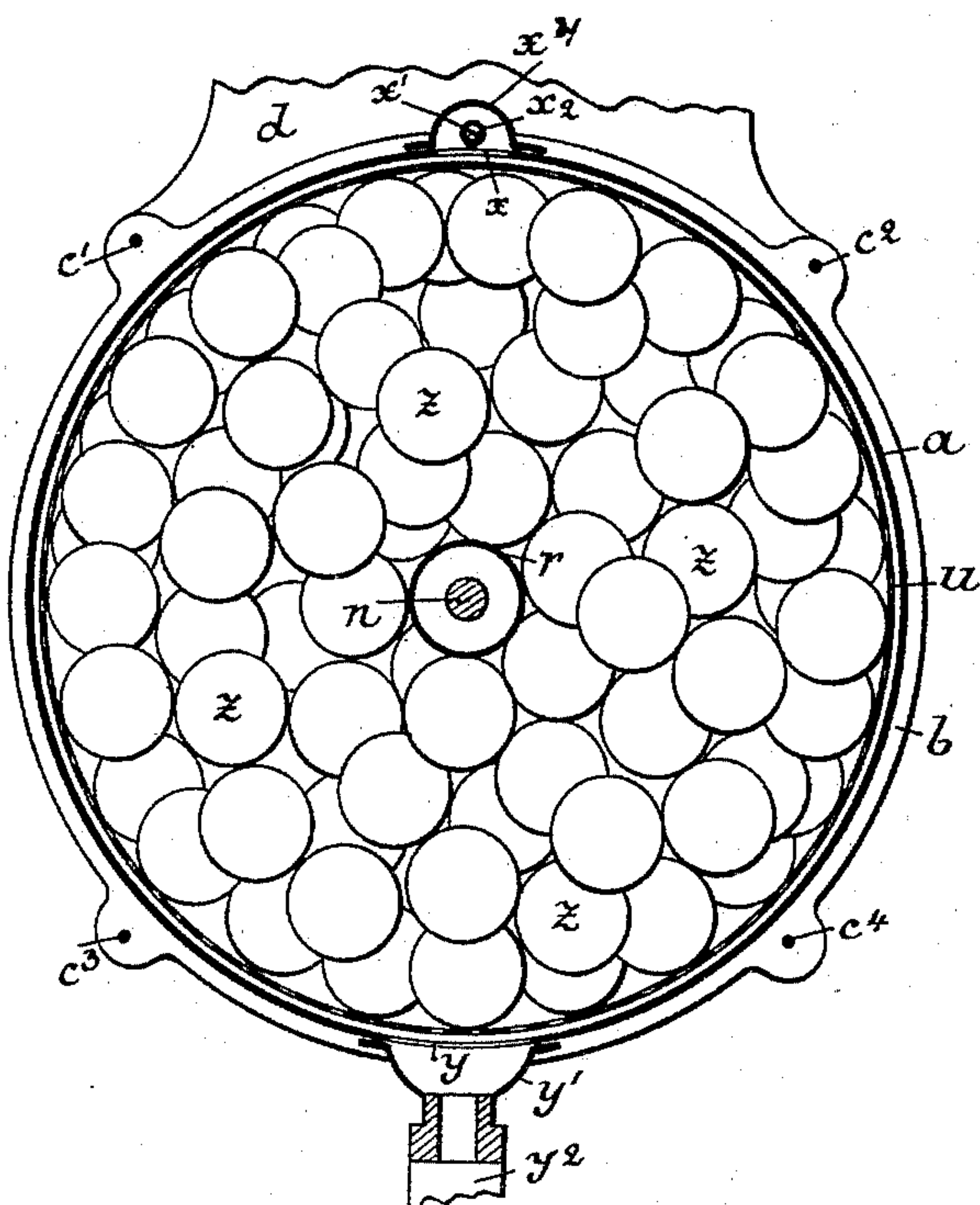
(No Model.)

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A. SCHMID.  
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No. 497,034.

Fig. 3. Patented May 9, 1893.



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# UNITED STATES PATENT OFFICE.

ALBERT SCHMID, OF ZURICH, SWITZERLAND.

## AIR-MOISTENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 497,034, dated May 9, 1893.

Application filed November 18, 1892. Serial No. 452,385. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT SCHMID, a citizen of Switzerland, and a resident of Zurich, Switzerland, have invented certain new and useful Improvements in Air-Moistening Apparatus, of which the following is a specification.

This invention relates to an apparatus for moistening the atmosphere in rooms and at the same time removing impurities from this atmosphere.

The invention consists in an air moistening apparatus constructed with a casing containing a fan-blower, a perforated drum filled with balls and means for conducting water upon said balls.

The invention further consists in the combination with said blower and the perforated drum and the balls, of means for slowly rotating the drum so that all the balls will be wetted by the water conducted into the apparatus.

The invention also consists in the construction and combination of parts and details, which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical longitudinal sectional view of my improved air moistening apparatus. Figs. 2, 3 and 4 are vertical transverse sectional views, on the lines 2 2, 3 3, 4 4 respectively of Fig. 1, and Fig. 5, is an elevation and sectional view of one of the balls used in the apparatus.

Similar letters of reference indicate corresponding parts.

The cylindrical casing *a* is provided at its rear end with a cylindrical extension *a'*, and the said casing *a a'* is held between two ring-shaped frames *b b'*, which in turn are connected with each other by rods *c' c<sup>2</sup> c<sup>3</sup> c<sup>4</sup>* running parallel with the casing. The ring shaped frames *b b'* are provided at their upper ends with hangers *d* by which they are fastened to the ceiling or other support. The ring-shaped frame *b* is provided with the radial arms *f*, which support the hub *g*. Said frame *b* is also provided with a funnel-shaped projection *b<sup>2</sup>*, and at the end of the same a ring *h* is arranged that has an approximately C-shaped cross-section, the open side of which faces toward the center of the apparatus. On the end of said funnel-shaped ex-

tension a cylinder *i* having perforations *i'* is applied, and said cylinder *i* is surrounded by a jacket *k*, the diameter of which gradually increases toward the center of the apparatus, so that the distance between the cylinder *i* and jacket *k* is less at the outer end of said jacket *i* than it is at the inner end. The jacket *k* and cylinder *i* are connected along the edges of said jacket and cylinder and at the bottom an outlet tube *k'* is provided for conducting water out of the space between the jacket and cylinder.

In the rear ring-shaped frame *b* a similar frame *l* is fastened, which is provided with radial arms *l'* carrying the hub *l<sup>2</sup>*. To said ring-shaped frame *b'* a plate *m* is secured, which closes the end of the casing of the apparatus. In suitable bearings in the hubs *g* and *l<sup>2</sup>* the shaft *n* is journaled, and on the said shaft a fan *o* is mounted within the perforated casing *i*, and on that end of the shaft adjacent to the end wall *m* a belt-pulley *p* is fixed. A tube *r* is mounted on the inwardly-projecting ends of the hubs *g* and *l<sup>2</sup>* in such a manner that it can turn on the same, and on said tube two cylindrical end frames *t* and *s* are fixed, which are provided with the arms *t' s'* respectively. Said end frames are connected by a cylindrical casing or drum *u* of perforated metal or netting. A worm *q* is mounted on the shaft *n* a short distance from the pulley *p* and is engaged with the worm-wheel *v<sup>2</sup>* fixed on the shaft *v* suitably mounted in journals attached to the arms *t'* of the frame *t* and carrying at the outer end a pinion *v<sup>3</sup>* that engages a fixed cylindrical rack *v<sup>4</sup>* attached to the inside of the casing *a*. As shown in Fig. 1, the worm-wheel *v<sup>2</sup>* passes through a longitudinal slot *r'* of the tube *r*. Above the top of the casing *a* a tube *x'* is arranged parallel with the rotating perforated drum *u* and above the same, which tube *x'* has both ends closed and is provided at the outer end with a funnel *x<sup>3</sup>*, through which water can be conducted into it. At the bottom said tube is provided with perforations *x<sup>2</sup>*, and directly under said tube a slot *x* is formed in the casing *a*, and the tube *x'* is covered by an inverted trough-shaped cap-plate *x<sup>4</sup>*. The casing *a* is also provided at the bottom with a longitudinal slot *y* and below the same a trough *y'* is fixed to the casing *a* and



an outlet pipe  $y^2$  is connected with the lowest point of said trough. The part  $a'$  of the casing  $a$  is provided on opposite sides with the openings  $a^2 a^3$ , at which the necks  $w^2 w^3$  are connected with the casing, and if desired pipes can be attached to said necks for conducting air to the apparatus. The perforated drum  $u$  is provided with the perforated end-walls  $u' u^2$ , and the said end-wall  $u^2$  is provided with a gate-section  $w^3$  to permit of inserting balls  $z$ , preferably made of wood or other material adapted to absorb water, which balls are provided with the transverse bores  $z' z^2 z^3$ . The rotative casing is entirely filled with such rotative balls.

The operation is as follows:—The shaft  $n$  and the fan  $o$  are rotated at a speed of from eighteen hundred to two thousand revolutions per minute. The fan-wheel draws the air through the apparatus, thus compelling the air to pass through the necks  $w^2 w^3$  into the casing  $a$  and through the perforated drum. As this drum is filled with balls  $z$  the air must pass through said balls and spaces between them and thereby is moistened. Water continually drops from the pipe  $x'$  through the slot  $x$  upon the balls, which absorb water until they are saturated. As they are perforated they present a very large surface to the air passing through the apparatus, and as a result the air becomes fully moistened. So that all the balls are moistened and constantly change their positions, the drum  $u$  must be rotated slowly. This is accomplished by means of the worm-gear described, as the worm  $q$  rotates the worm-wheel  $v^2$  on the shaft  $v$ . As the said shaft is mounted on one of the end-frames of the rotating drum and its pinion engages the fixed circular rack  $v^4$  it follows that the said drum must rotate slowly. The water that is not absorbed by the balls passes through the slot  $y$  into the trough  $y'$  and then passes off through the outlet pipe  $y^2$ . As the fan  $o$  rotates at a very high speed, particles of water are drawn along with the air, and to prevent them from passing into the room the ring  $h$  has been provided, against which the particles of water strike and flow down to the bottom of the same. But some particles of water even pass the ring  $h$  and are thrown by the fan  $o$  with the air against the perforated casing  $i$  and collect in the jacketed space between said cylinder  $i$  and the jacket  $k$  and flow through the outlet-pipe  $k'$  into the bottom of the casing  $a$  and from the same into the trough  $y'$ . It is evident that the coarser impurities are held back by the screens or perforated plates of the apparatus and also adhere to the balls and are washed from the same by the streams of water. Chemicals for disinfecting the air can be added to the water that is used for moistening the balls, so as to disinfect the air. If hot water is used in the apparatus the air

is heated at the same time, and if cold water is used in summer the air is cooled.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an air-moistening apparatus, the combination with a casing, of a rotative fan-blower, a perforated drum in the casing, means for rotating said drum, perforated balls in said drum and means for conducting water upon said balls, substantially as set forth.

2. In an air moistening apparatus, the combination, with a casing having a funnel shaped neck, of a perforated cylinder mounted on said neck, a fan blower mounted to rotate in the perforated cylinder, a rotating drum in the casing, balls on said drum and means for conducting water upon the balls, substantially as set forth.

3. In an air-moistening apparatus, the combination with a casing having a funnel-shaped neck at one end, a perforated jacketed cylinder on said neck, a C-shaped ring held in the end of the neck, a perforated drum in the casing, balls in said drum and means for conducting water upon the balls, substantially as set forth.

4. In an air-moistening apparatus, the combination with a casing, of a rotating drum in the same, balls in said rotating drum, a longitudinal slot in the top of the casing, a perforated pipe above said slot, a slot in the bottom of the casing and a collecting trough below said slot, substantially as set forth.

5. In an air-moistening apparatus, the combination with a casing, of side openings at one end of the casing, a tapering neck at the opposite end of the casing, a rotating fan-blower in advance of said tapering neck, a rotating drum within the casing between the tapering neck and the side openings, balls in said drum and means for conducting water upon the balls, substantially as set forth.

6. In an air-moistening apparatus, the combination with a casing, of a shaft mounted in the same, a fan mounted on said shaft, a rotary perforated drum in the casing, balls on said casing a shaft mounted on one end of the rotating drum and provided at one end with a worm-wheel and at the other end with a pinion, a fixed circular rack with which the pinion can engage, a worm on the fan-shaft, which worm engages the worm wheel and means for conducting water upon the balls, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ALBERT SCHMID.

Witnesses:

C. G. BERNHARD,  
H. RABHARD.