

No. 896,447.

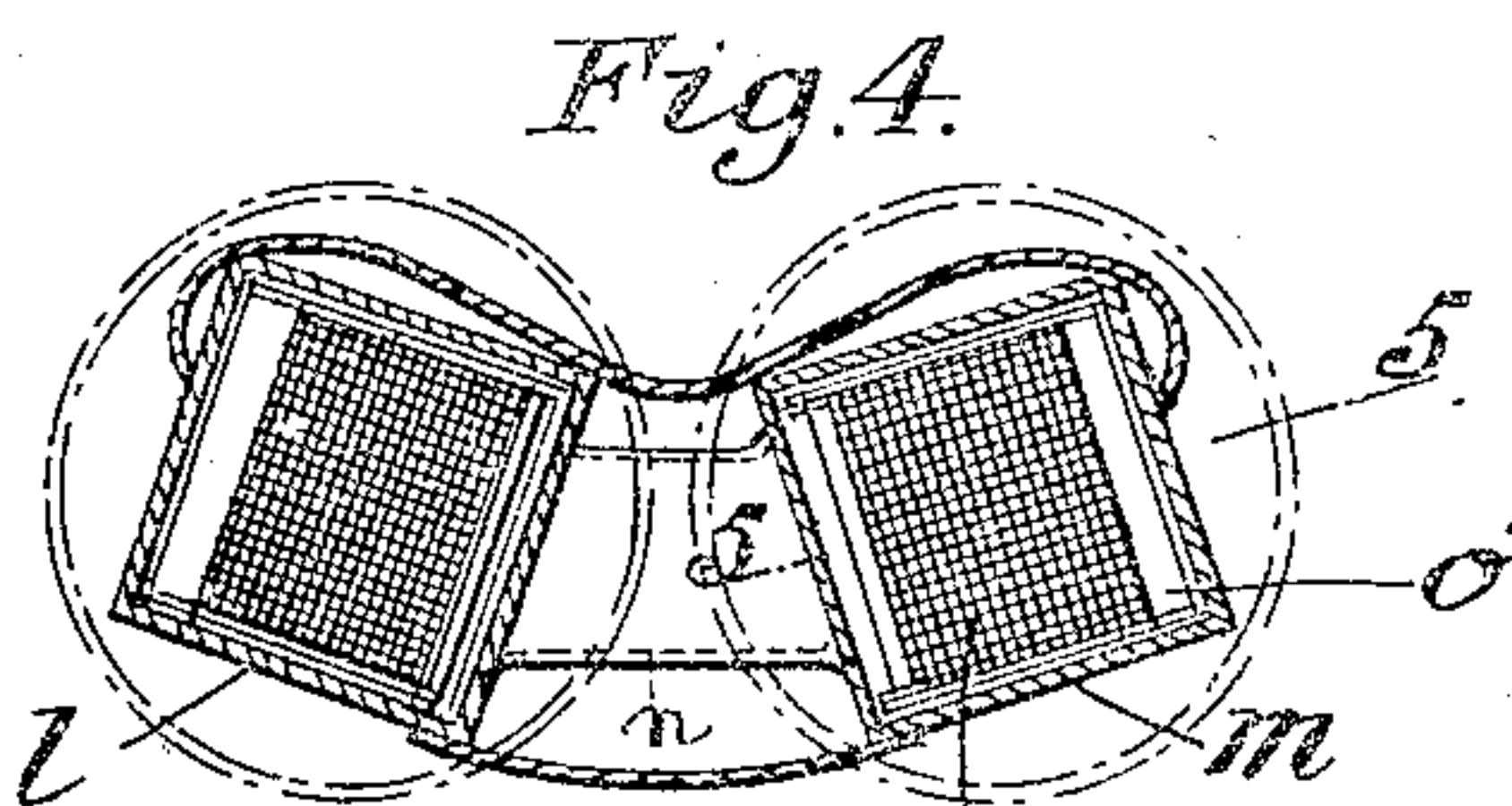
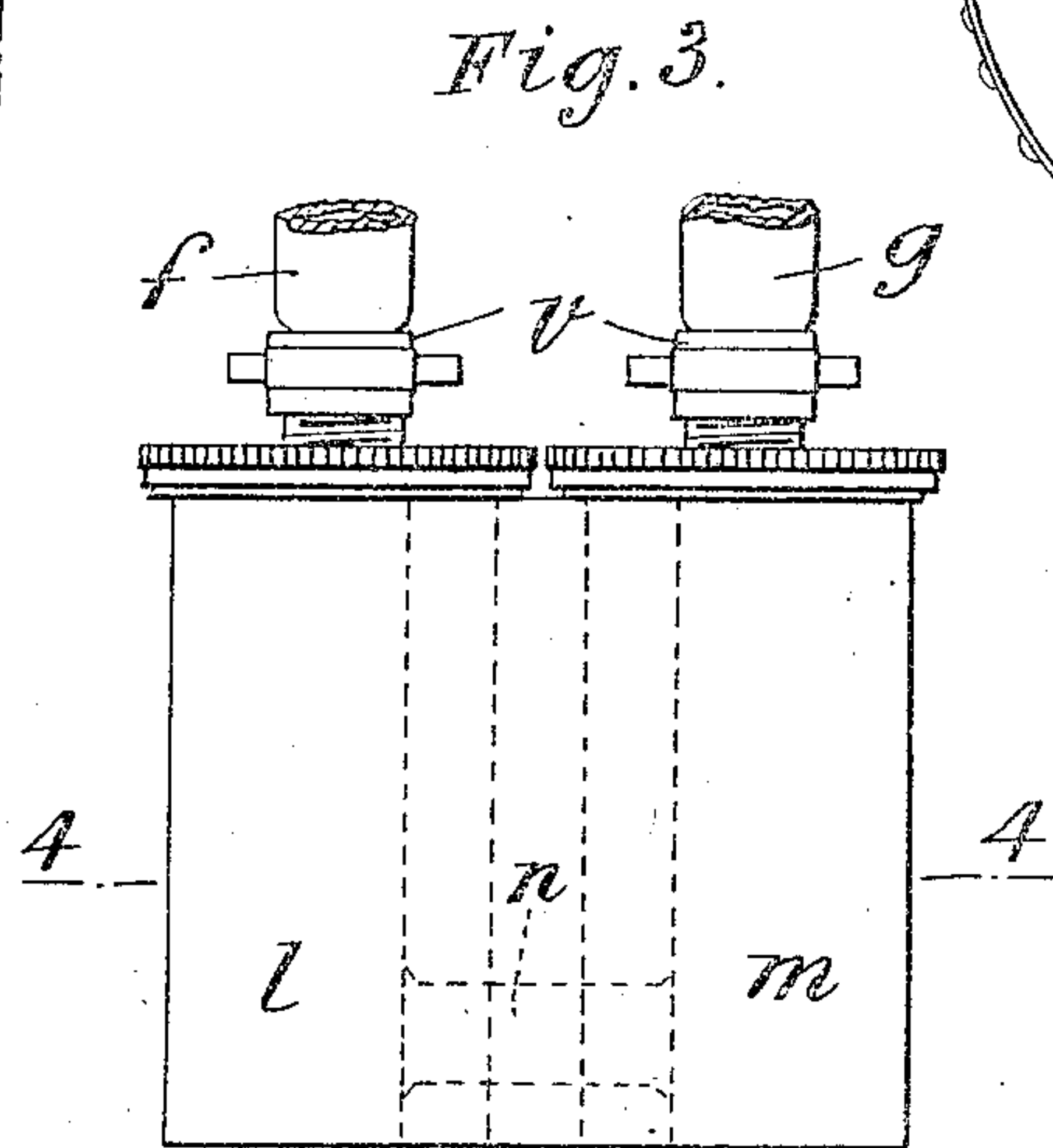
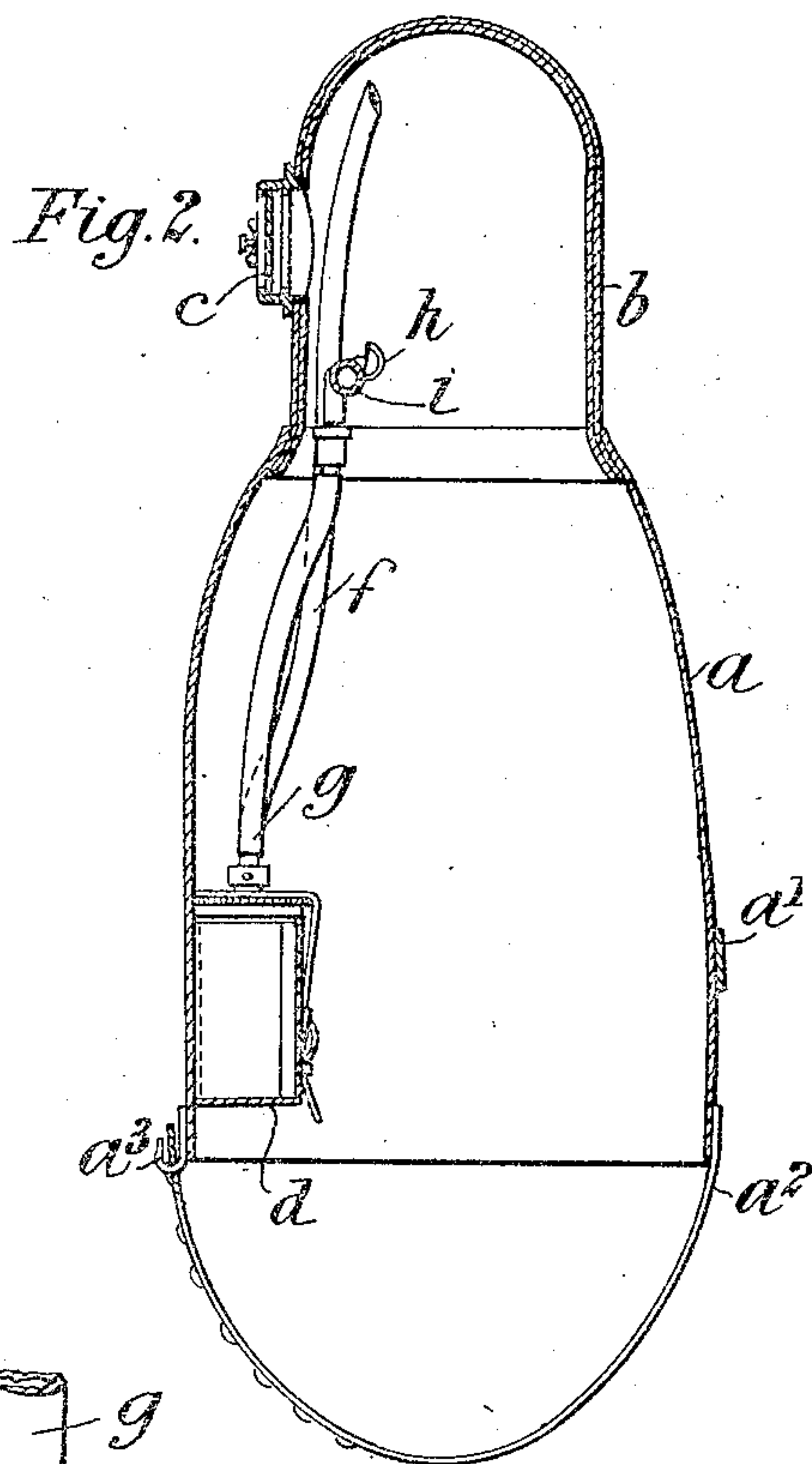
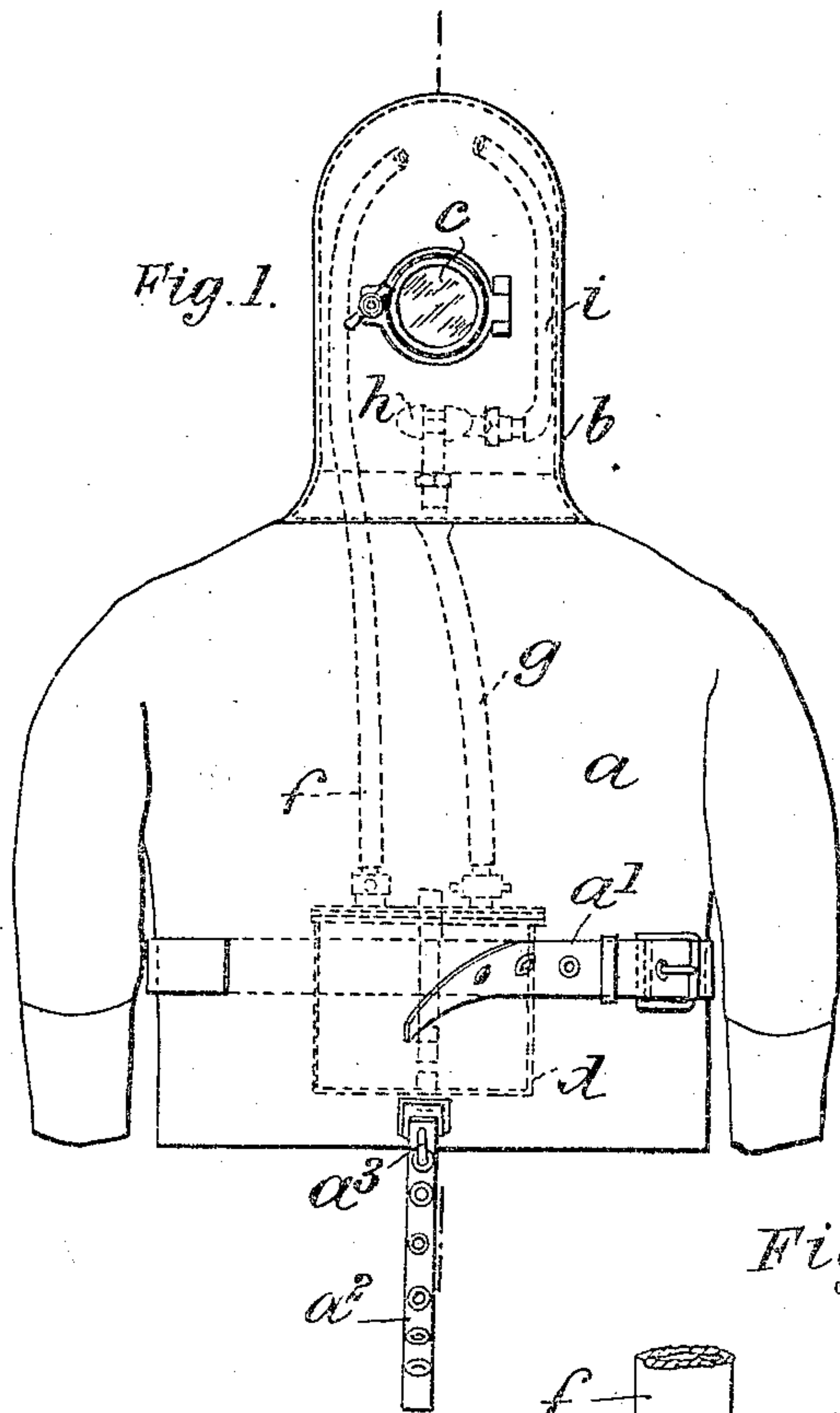
PATENTED AUG. 18, 1908.

S. S. HALL & O. REES.

AIR REGENERATING AND PURIFYING APPARATUS.

APPLICATION FILED FEB. 17, 1908.

2 SHEETS—SHEET 1.



Witnesses:
J. K. Moore
R. E. Barry.

Inventors:
Sydney Stewart Hall
Oswald Rees.
Whitaker & Treworth Attys

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2 SHEETS—SHEET 2.

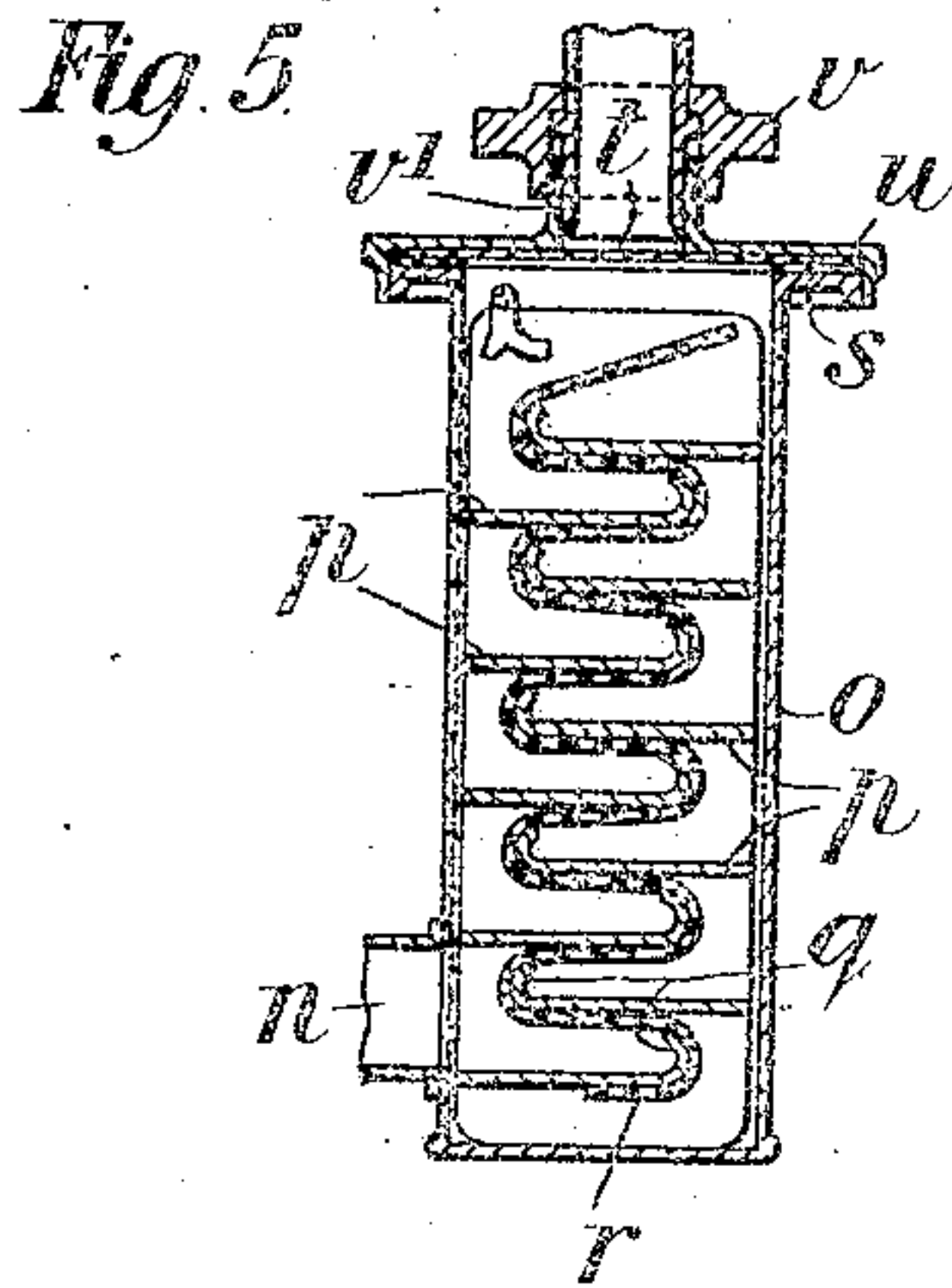


Fig. 6

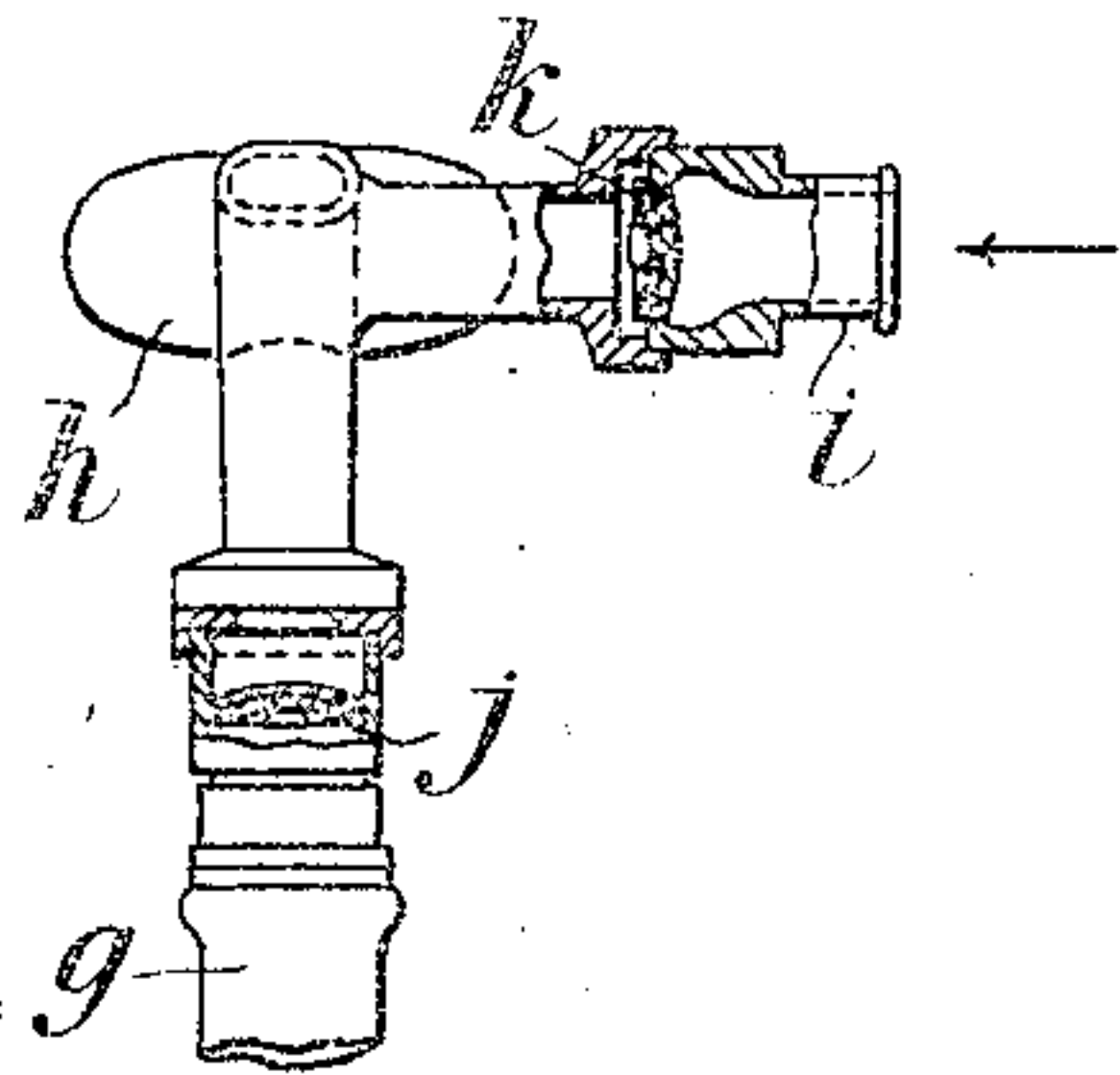


Fig. 7

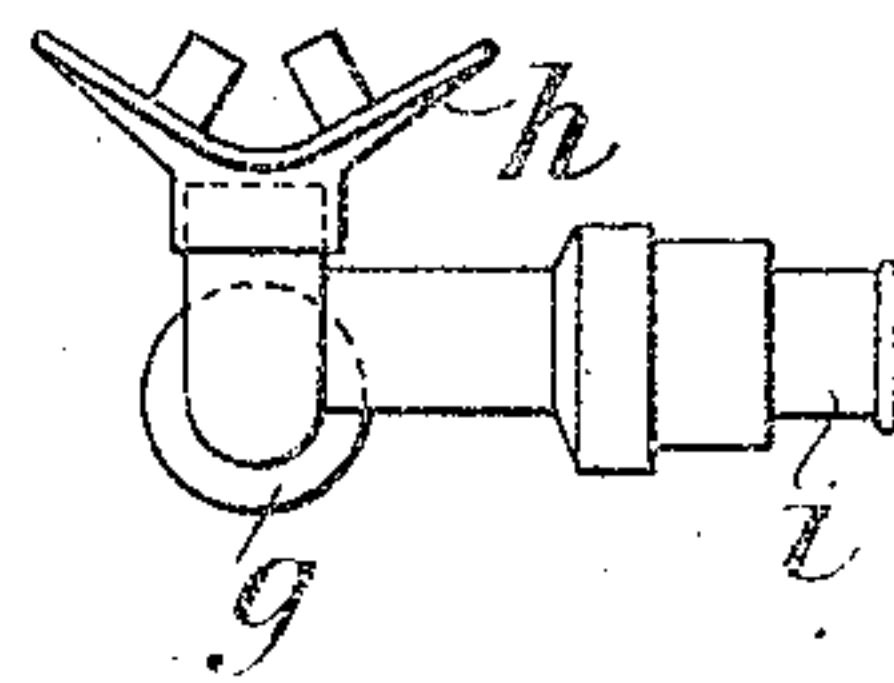
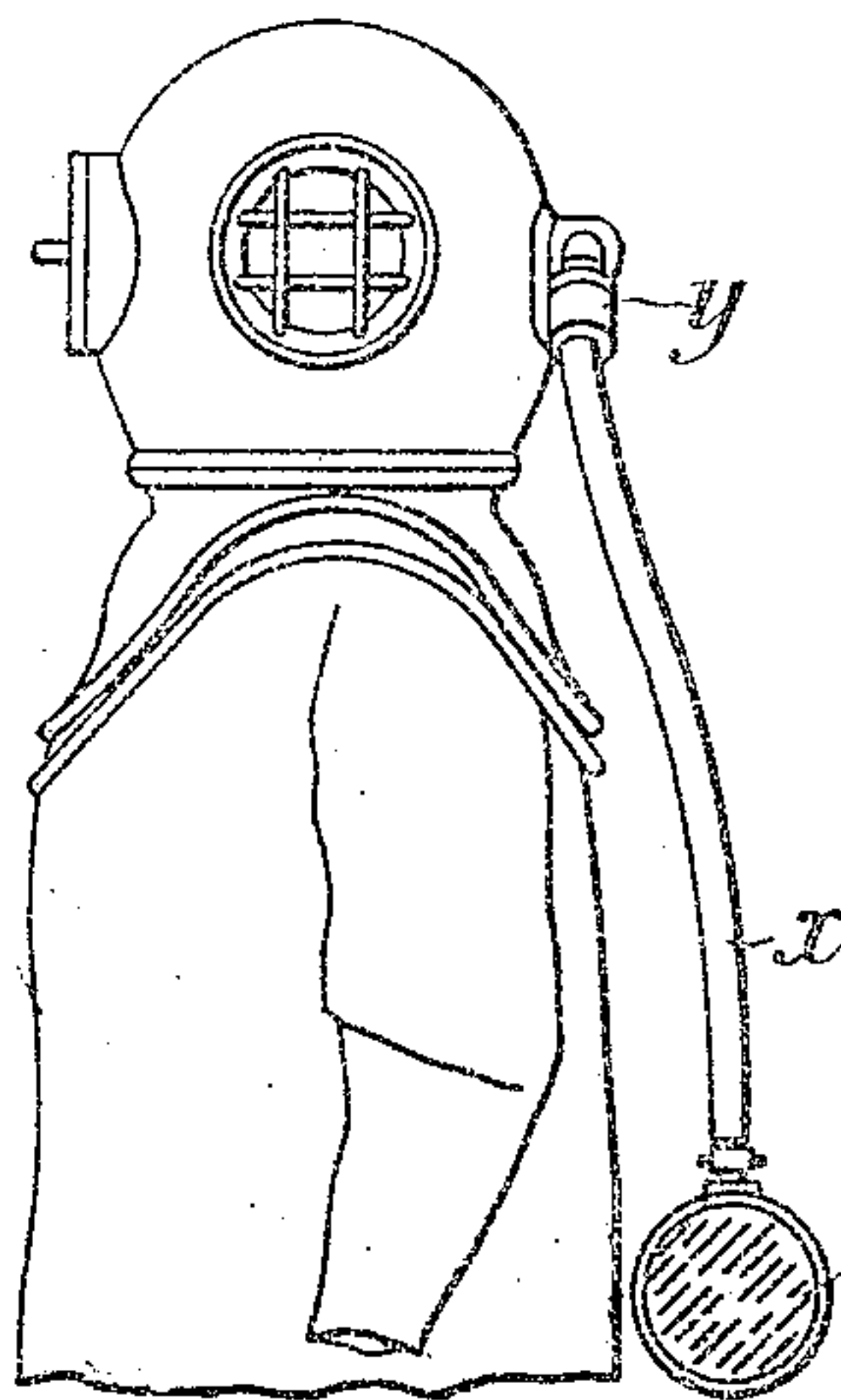


Fig. 8



Witnesses.

J. K. Moore.
R. E. Barry.

Inventors.

Samuel Stewart Hall
O. Rees
By Whitaker & Moore Attys.

UNITED STATES PATENT OFFICE.

SYDNEY STEWART HALL AND OSWALD REES, OF PORTSMOUTH, ENGLAND.

AIR REGENERATING AND PURIFYING APPARATUS.

No. 396,447.

Specification of Letters Patent.

Patented Aug. 18, 1908.

Application filed February 17, 1908. Serial No. 416,407.

To all whom it may concern:

Be it known that we, SYDNEY STEWART HALL and OSWALD REES, both subjects of the King of Great Britain, residing at H. M. S. *Mercury*, Portsmouth, Hants, England, have invented new and useful improvements in air regenerating and purifying apparatus particularly useful in combination with a dress for use in submarine vessels and also for rescue work in mines and other places and for diving, of which the following is a specification.

This invention relates to improvements in air regenerating and purifying apparatus particularly useful in combination with a dress for use in submarine vessels, and also for rescue work in mines and other places and for diving and has for its object to provide a simple, cheap and effective apparatus of the kind wherein a number of shelves is provided for the regenerating and purifying medium, the air exhaled by the wearer of the dress passing over and in contact with the said medium.

According to the invention we provide two chambers communicating with one another and furnished with receptacles or holders adapted to receive the regenerating and purifying medium. Each holder is provided with a number of shelves arranged alternately at each side of the holder in a known way. From top to bottom of the holder wire gauze is passed in a zig-zag manner between the shelves thereby forming a series of receptacles for the regenerating and purifying medium.

To enable the invention to be fully understood we will describe the same by reference to the accompanying drawing, in which:—

Figure 1 is a front view and Fig. 2 is a side view showing the application of our improved air regenerating and purifying apparatus to a dress designed for use in submarine vessels. Fig. 3 is a front view of the purifier drawn to a larger scale than Figs. 1 and 2. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a section on the line 5—5 of Fig. 4. Fig. 6 is a sectional front view of the mouth-piece also drawn to a larger scale than Figs. 1 and 2. Fig. 7 is a plan of Fig. 6. Fig. 8 is a view of the upper part of a diving dress adapted for use according to the invention.

a is the body of the dress or tunic and *b* is the helmet provided with a quick-closing front glass *c*, the waist portion of the tunic

being provided with a belt *a'* and the lower portion having a strap *a''* designed to pass between the legs of the wearer and engage a hook *a'''*. At the lower part of the dress is a pocket *d* to receive the air regenerator and purifier *e*, provided with two tubes *f*, *g*, the first of which serves to convey the regenerated and purified air to the upper part of the helmet and the latter is an exhaling tube connected to a mouth-piece *h* also connected to an inhaling tube *i*, opening into the upper part of the helmet. The tubes *g* and *i* are provided with non-return valves *j*, *k*, Fig. 6. It will thus be seen that air is inspired through the valve *k* and expired through the valve *j*.

The air purifier *e* comprises two chambers *l*, *m* communicating through a tube *n* and provided with receptacles or holders *o* for the oxygen-evolving agent which may advantageously be a preparation of peroxid of sodium and potassium capable of absorbing CO_2 . Each holder *o* is formed of a simple shell or casing and is provided with a number of shelves *p* arranged alternately at each side of the holder in a known way, the outer edge of each shelf being provided with a lip or turned up part *q*. From top to bottom of the holder wire gauze *r*, is passed in a zig-zag manner between the shelves, thus forming a series of receptacles for the oxygen-evolving agent.

As it is necessary to keep the chemical holders air-tight until required for use a thin disk *s* of lead or other suitable metal may be soldered over the hole *t* on the underside of the cover *u*. The unions *v* are each provided with a spigot or projecting part *v'* which when the said unions are screwed on to the covers of the purifier, forces away the disk *s* in the known manner and the oxygen producing material is exposed to the action of the breath.

In addition to its use in submarine vessels it is obvious that the dress may be employed as a smoke helmet for firemen and also in mines for rescue work.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. The combination with a dress for use in submarine vessels, for rescue work in mines and other places and for diving, said dress comprising a tunic and helmet, of an air re-

generator and purifier consisting of a receptacle having shelves to receive the air-regenerating and purifying medium, said shelves being arranged alternately on each side of the receptacle and provided with wire gauze passing in a zig-zag manner between them, and tubes extending from the purifier and opening respectively into the helmet of the dress and into a mouth piece within said helmet, substantially as hereinbefore described.

2. An air regenerator and purifier comprising two holders for the air regenerating and purifying medium, said holders having a number of shelves arranged alternately on each side thereof and wire gauze passing from top to bottom in a zig-zag manner between

said shelves, substantially as hereinbefore described.

3. An air regenerator and purifier comprising two holders for the air regenerating and purifying medium said holders having a number of shelves arranged alternately on each side thereof each of said shelves having a lip or turned up part and wire gauze passing from top to bottom in a zig-zag manner between said shelves, substantially as hereinbefore described.

SYDNEY STEWART HALL.
OSWALD REES.

Witnesses:

H. D. JAMESON,
F. L. RAND.