

C. E. CHAPIN.
RESPIRATORY APPARATUS FOR FIREMEN OR OTHERS.
APPLICATION FILED MAR. 2, 1910.

986,907.

Patented Mar. 14, 1911.

Fig. 1.

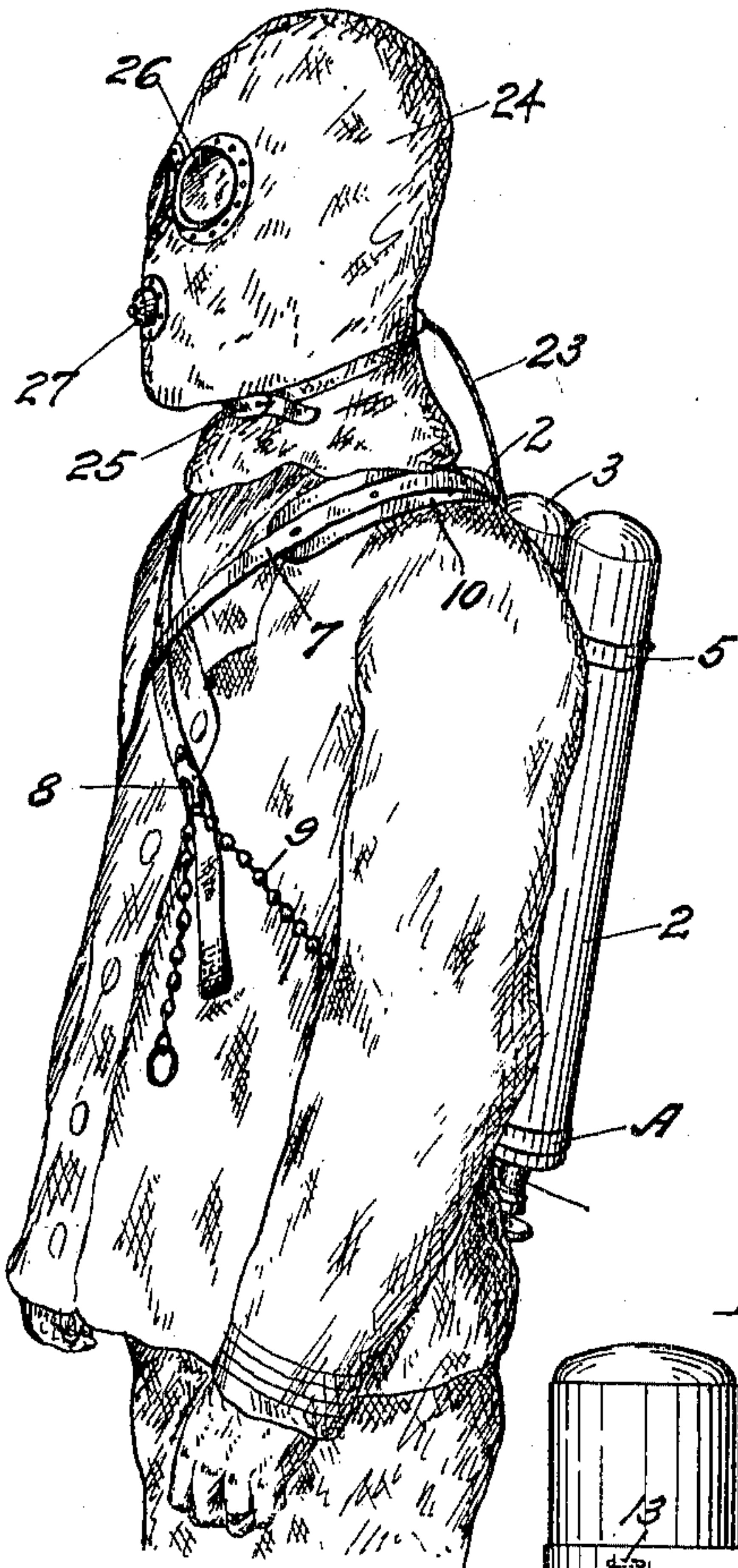


Fig. 2.

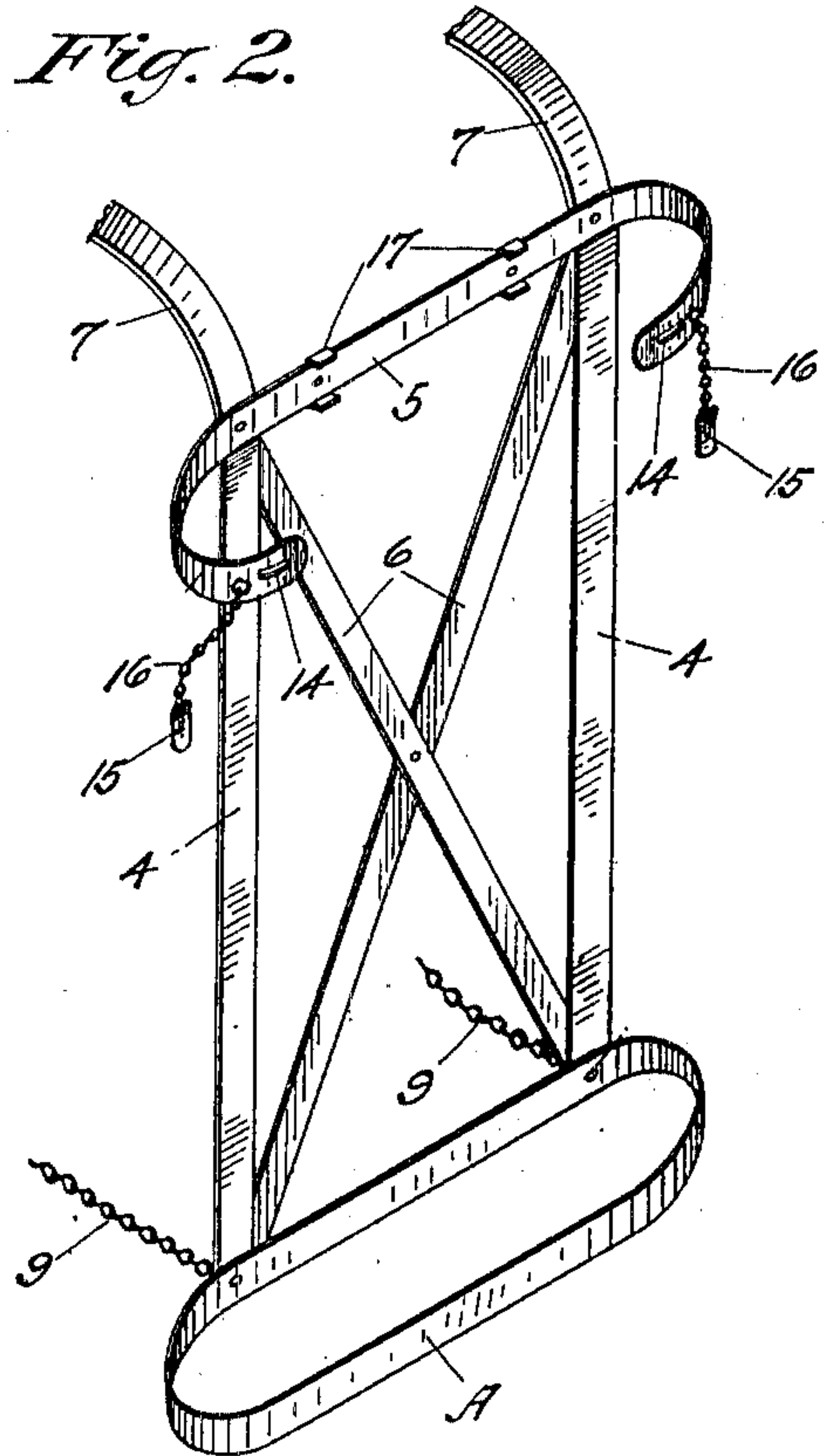


Fig. 3.

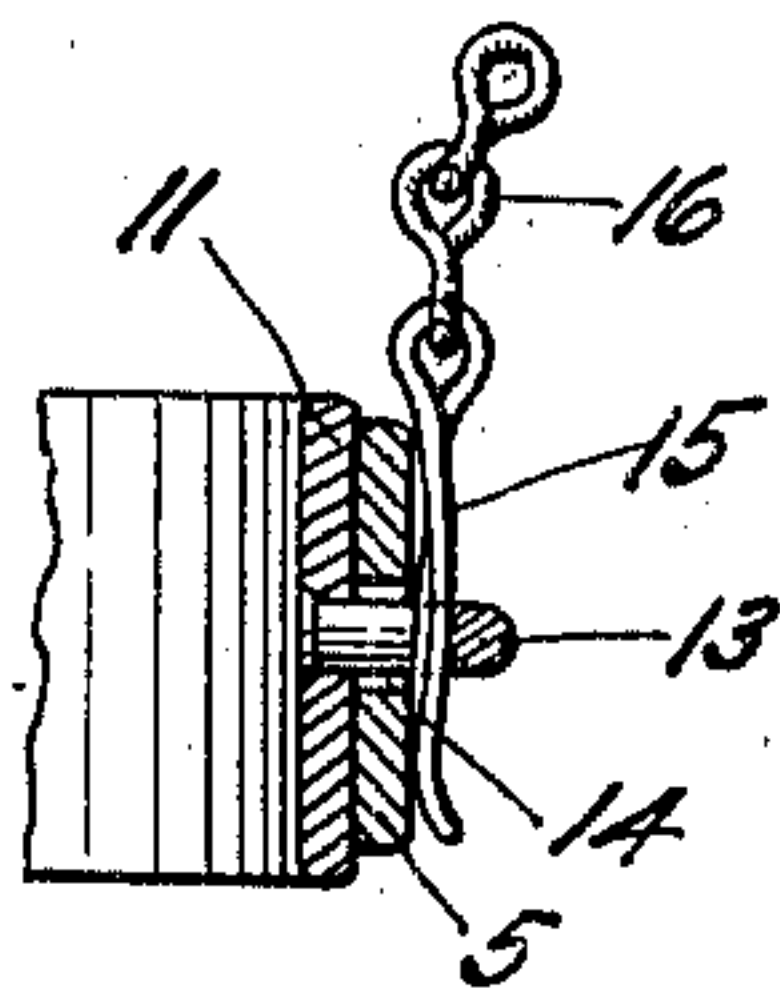
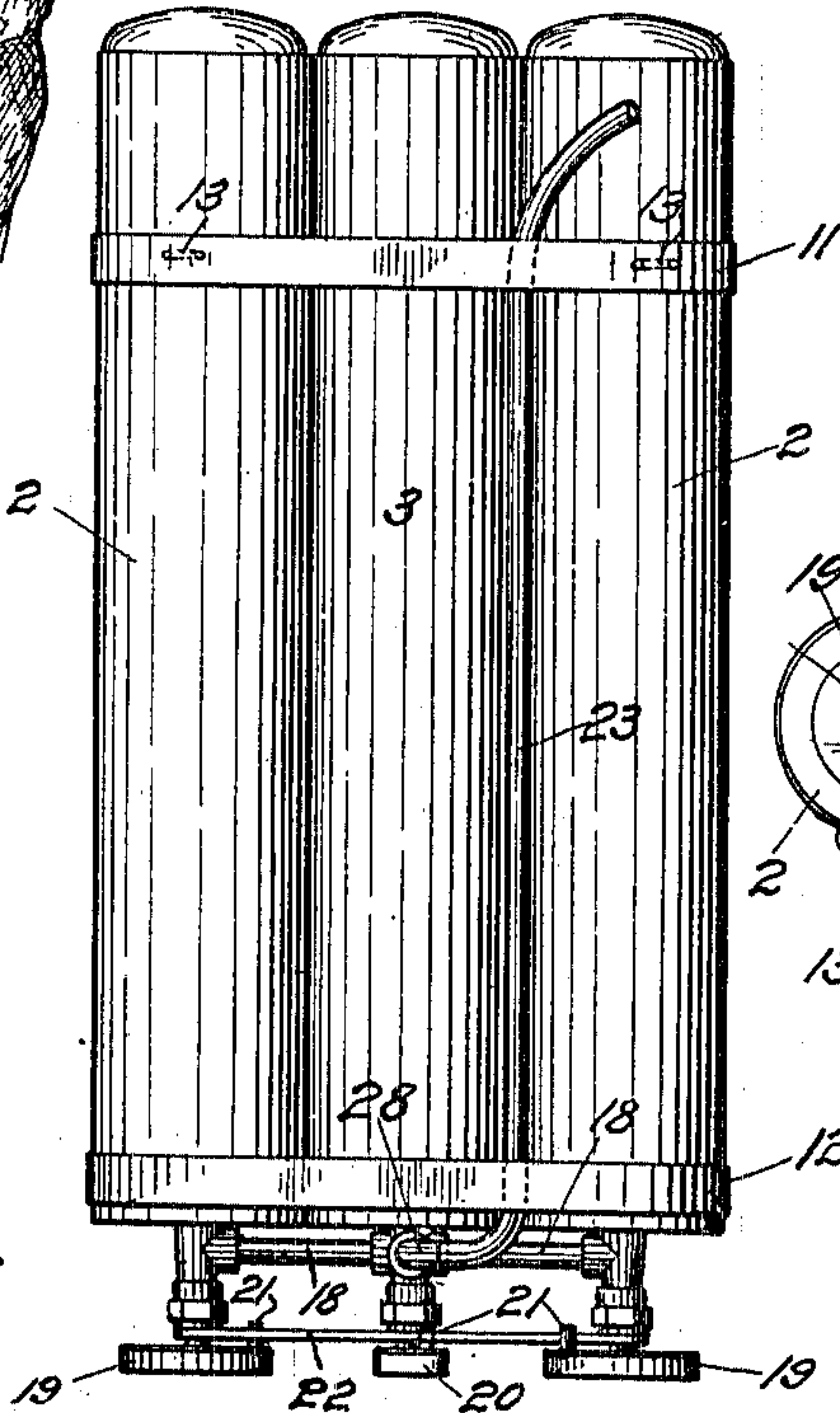
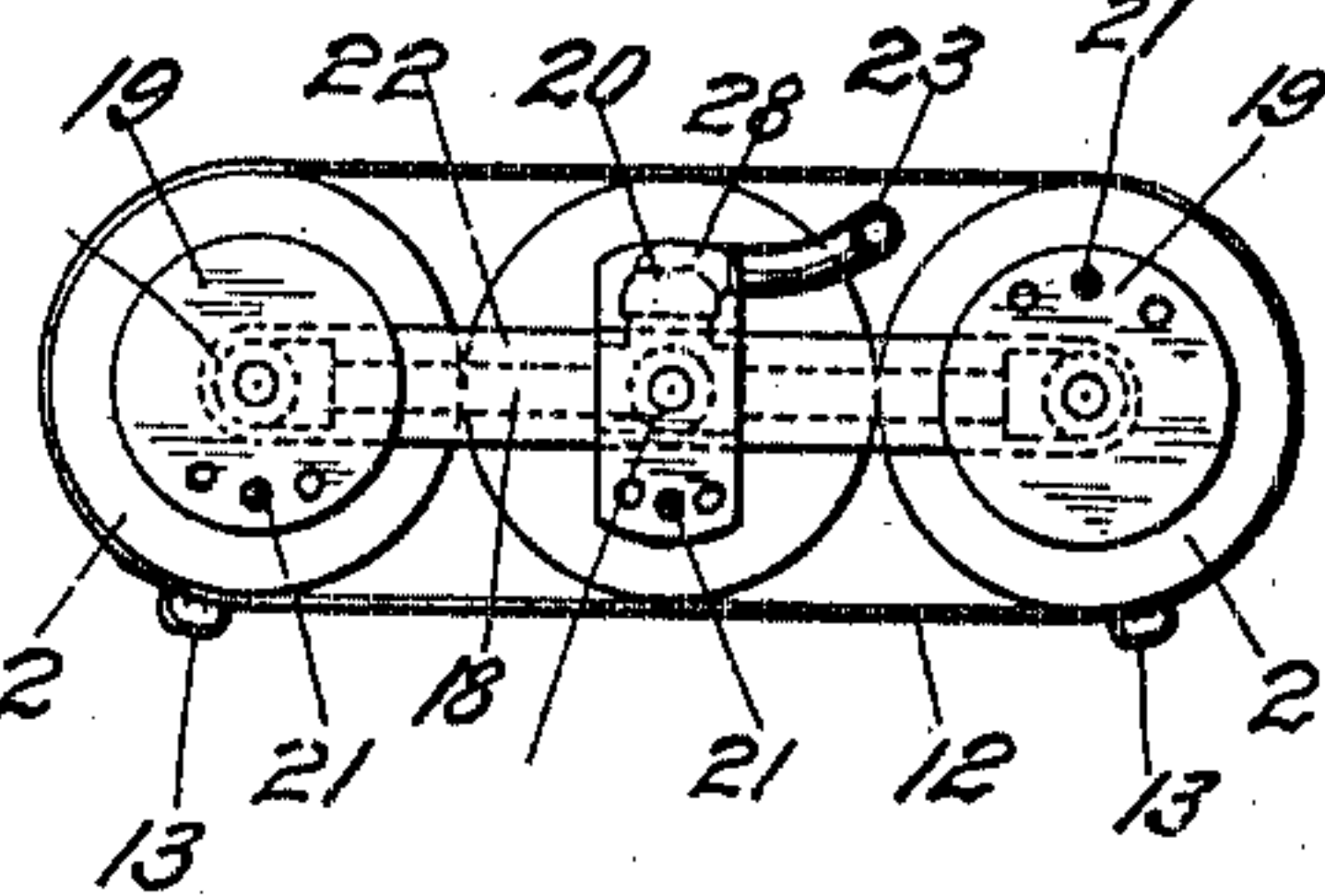


Fig. 5.

WITNESSES:
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Fig. 4.



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RESPIRATORY APPARATUS FOR FIREMEN OR OTHERS.

986,907.

Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed March 2, 1910. Serial No. 546,877.

To all whom it may concern:

Be it known that I, CHARLES E. CHAPIN, citizen of the United States, residing at Elmhurst, in the county of Alameda and State of California, have invented new and useful Improvements in Respiratory Apparatus for Firemen or Others, of which the following is a specification.

This invention relates to respiratory apparatus for use of firemen, miners and others in entering buildings, mines, holds of vessels and other places which may be filled with smoke, fumes or noxious vapors.

The object of the present invention is to provide a simple, practical apparatus of this sort which can be readily carried on the back of the operator, which will provide means for quickly putting on or taking off fresh cylinders without removing the harness by which the cylinders are held, which will have means for preventing the waste or excessive use of the charged air, and which will have means for providing an auxiliary or reserve supply.

There are other advantages which will be apparent hereinafter.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a perspective view showing the application of the invention. Fig. 2 represents a part of the harness or frame for carrying the air cylinders. Fig. 3 is an elevation of the cylinders. Fig. 4 is a bottom end view of the same. Fig. 5 is a detail in section of the hasp for holding the cylinders in the harness or rack.

In carrying out my invention, I provide a suitable rack, carrier or harness, represented in Figs. 2 and 1, for carrying the cylinders shown in Fig. 3. This carrier or harness comprises essentially a rigid framework to fit the back of the wearer, consisting of a lower, rigid, continuous, elongated loop member A forming a seat for the lower end of the cylinders 2—3 of Fig. 3, this loop A being supported by and secured to the side bars 4, Fig. 2, which latter carry at their upper ends a partially closed rigid loop 5; the several loops A—5 and side bars 4 being suitably braced by the cross or diagonal bars 6.

7 are shoulder-straps which pass over the shoulders of the operator and cross in front,

and have hooks 8 for the securing of a chain or like connection 9, which latter extends backward under the arms to connect with the frame adjacent to the loop A. The shoulder-straps 7 may be provided with suitable pads 10.

There may be any number of air cylinders 2—3, but I prefer to arrange them in battery form of three, as here shown, the outside cylinders 2 being regular working cylinders, and the intermediate cylinder 3 being the reserve cylinder; the three cylinders being suitably secured together in a rigid structure by means of the top and bottom straps 11—12. These cylinders are adapted to be charged with air and set into the loop A—5 and secured therein by suitable means, as the hasps 13 on the upper fastening band 11, these hasps 13 fitting corresponding slots 14 in the springy curved ends of the loop 5. Pins 15 carried on little chains 16 fit these hasps and prevent the cylinders falling.

If desired, the rear cross-piece of the loop 5 may have the lugs or flanges 17 which are adapted to embrace the edges of the back part of the straps 11; these flanges 17 and the hasps 13 being sufficient to support the weight of the cylinders.

The several cylinders are connected together at the bottom by a pipe 18, but the discharge from each cylinder is separately controlled by a respective valve; the handles for the valves of the two outside cylinders 2 being represented at 19, and the handle of the valve for the middle cylinder 3 being represented at 20. These handles are made of different shape, so that an operator, in reaching around to turn on the air of one or the other of these cylinders, will not make a mistake in drawing on his reserve cylinder first. For that reason the handles 19 are made round, and the handle 20 is made oblong.

In order to limit the amount of movement of the valves so that an excess of air will not be turned on and waste the operator's precious supply, I provide stops 21 on handles 19 and 20 which are adapted to contact with the rigid cross-bar 22 when either valve is opened sufficiently.

Practical use is made of the apparatus by attaching a hose or the like 23 to pipe 18 and leading this hose up to connect with the rear of a suitable mask or hood 24, which latter is adapted to be placed over the head

of the wearer and is made of suitable water-tight and fire-proof fabric, and is provided with a neck portion to fit around the neck of the wearer and to be secured by suitable means, as the strap 25. The front of the hood or mask has suitable goggles or glazed peep-holes 26 through which the operator may look, and a valved opening 27 is arranged opposite the mouth, so that ordinarily while the entrance of outside air will be prevented, the valve will automatically open for the egress of the exhaled breath of the wearer. The valve is also arranged so that it can be opened manually and held open, so that the operator can breathe the outside air where the same is pure, and so conserve his supply in the reservoirs.

In operation, the harness of Fig. 2 is placed on the back of the wearer, and the charged battery of cylinders 2—3 set into this harness and secured therein, and the hose 23 coupled to the discharge pipe 18 preferably by means of a suitable quick-detachable coupling 28 of any suitable pattern. The hood being placed on the wearer and secured, the operator, by turning one or the other of the handles 19 until the stop-pin 21 strikes the stop-bar 22, will receive a sufficient supply of air to allow him to breathe comfortably in the densest smoke, or in the presence of the most deadly fumes or vapors. When one cylinder 2 is exhausted, he can then open the valve of the other cylinder 2 by similarly turning the handle 19. When these are exhausted he can draw on his final reserve by manipulating the handle 20.

By having the handles 19—20 of different shape, and using the outside cylinders 2 successively, and the contents of cylinder 3 for the last, the operator will always know how much air he has left, and how much time he has in which to get out of danger; the reserve cylinder 3 being used by him only in case of extreme emergency, and the supply of which is known to last for a definite time which under the circumstances is presumed to be sufficient wherein to effect his escape.

Where it is desired to work continuously and rapidly without removing the hood, it is a simple matter, by reason of the hasp connections 13 and the detachable coupling 28, for an associate to take off a battery of empty cylinders and almost instantly replace them with a freshly charged battery, allowing the operator to go on with his work without suffering any inconvenience.

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

1. In a respiratory apparatus, the combination of a harness consisting of upper and lower loop members suitably connected together and fitting the back of the wearer, means for securing the harness on the wearer, and a battery of cylinders detachably fitting said harness, each of said cylinders having a separately controlled valved outlet, and certain of the valves having means appreciable to the touch for distinguishing them.

2. A respiratory apparatus having a plurality of portable cylinders combined as a unit, the cylinders having valved outlets, and certain of the valves having means appreciable to the touch for distinguishing them.

3. In a respiratory apparatus, the combination of a plurality of cylinders united as a unit, a pipe into which all the cylinders may discharge, each cylinder having its outlet provided with a valve, means appreciable to the touch for distinguishing the valves, and means for limiting the opening movements of the valves.

4. In a respiratory apparatus, the combination of a plurality of cylinders united as a unit, a discharge pipe common to all the cylinders, a valve separately controlling the outlet from each cylinder, said valves having handles, the handles of the valves of the cylinders lying approximately in the same plane, pins on the handles, and a stop-bar engageable by the pins limiting the opening movement of the valves.

5. In a respiratory apparatus, the combination of a harness including a lower, continuous, elongated loop, and an upper partially closed loop with inwardly curved ends, connections between the loops, air cylinders fitting in the loops, and cooperating means on the loops and cylinders for holding the latter in place.

6. In a respiratory apparatus, the combination of a harness including a lower, continuous, elongated loop, and an upper partially closed loop with inwardly curved ends, connections between the loops, a set of air cylinders united as a unit fitting within the loops, the cylinders carrying hasps fitting perforations in the inwardly turned ends of the upper loop, and pins fitting said hasps.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES E. CHAPIN.

Witnesses:

V. H. PARK,
MICHAEL MULI.