

R. HAZELRIGG.  
VACUUM SUPPORTING DEVICE.  
APPLICATION FILED MAR. 6, 1909.

993,989.

Patented May 30, 1911.

Fig. 1.

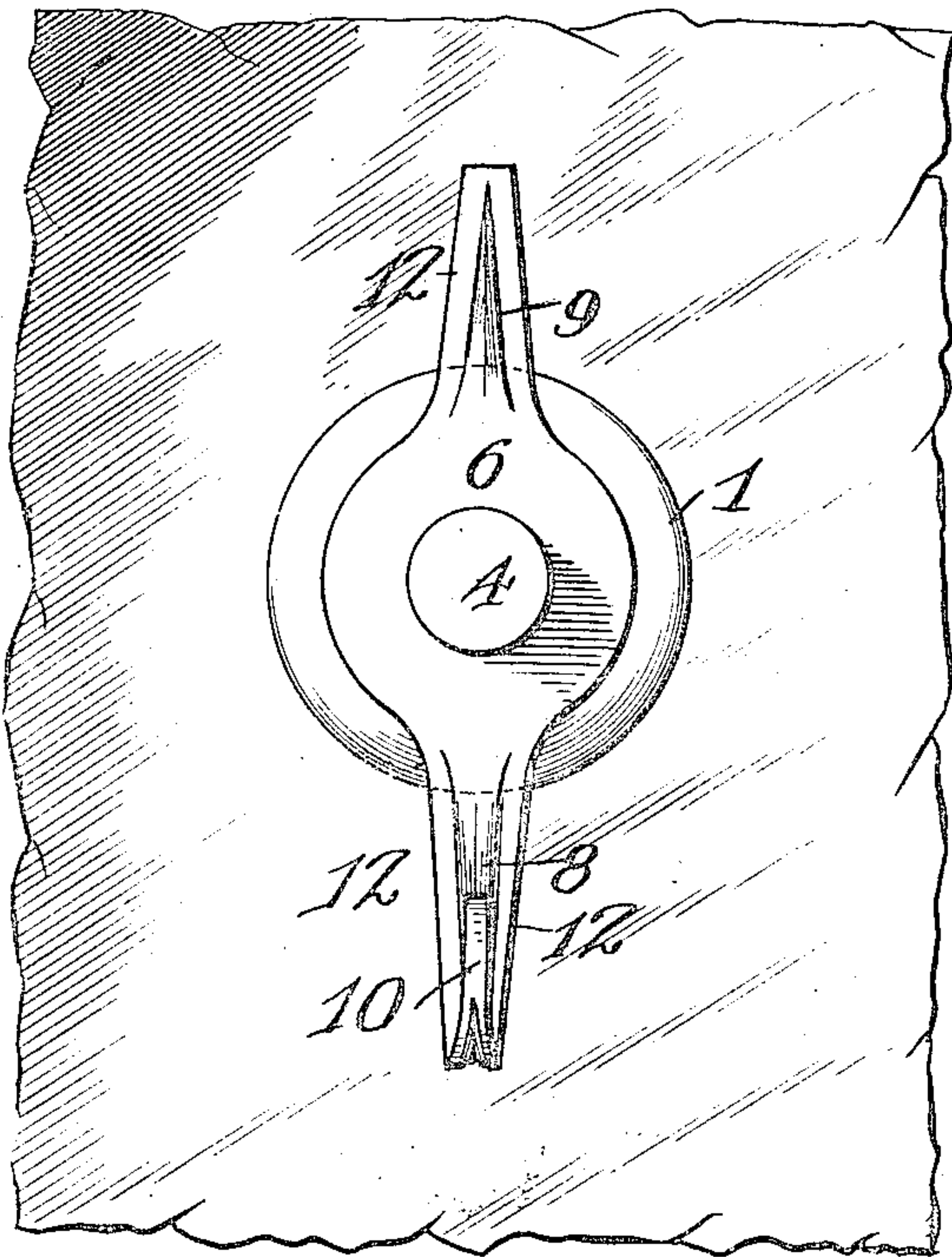


Fig. 2.

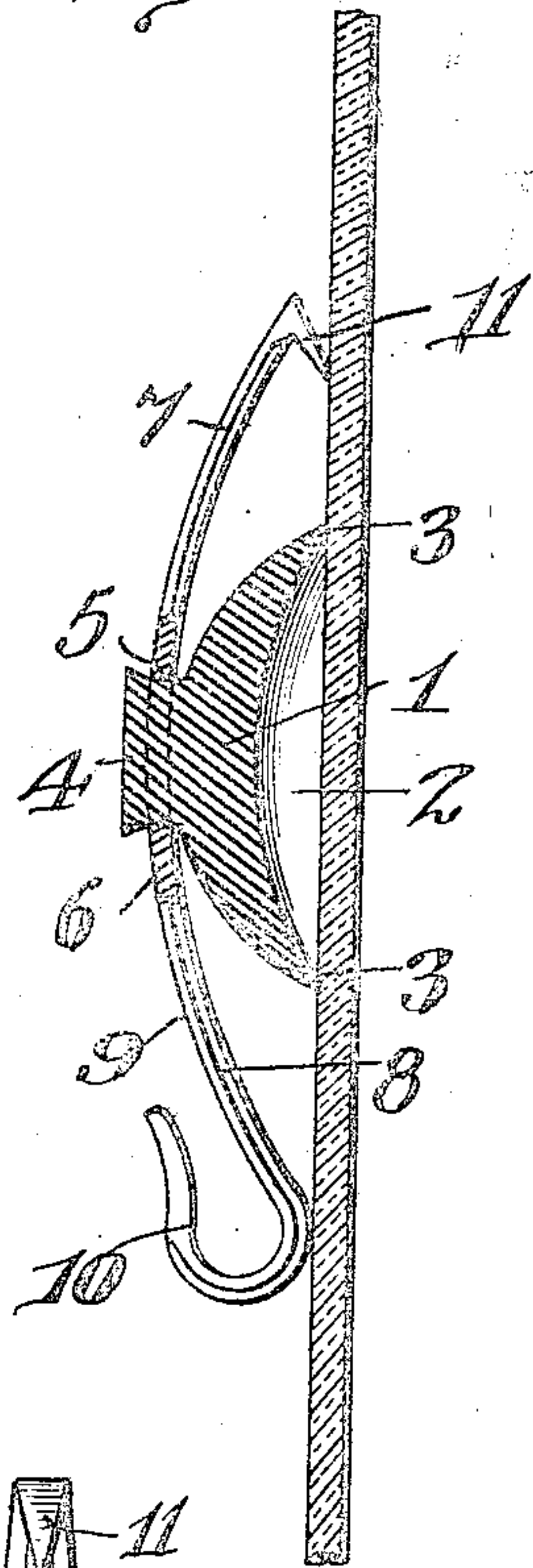


Fig. 3.

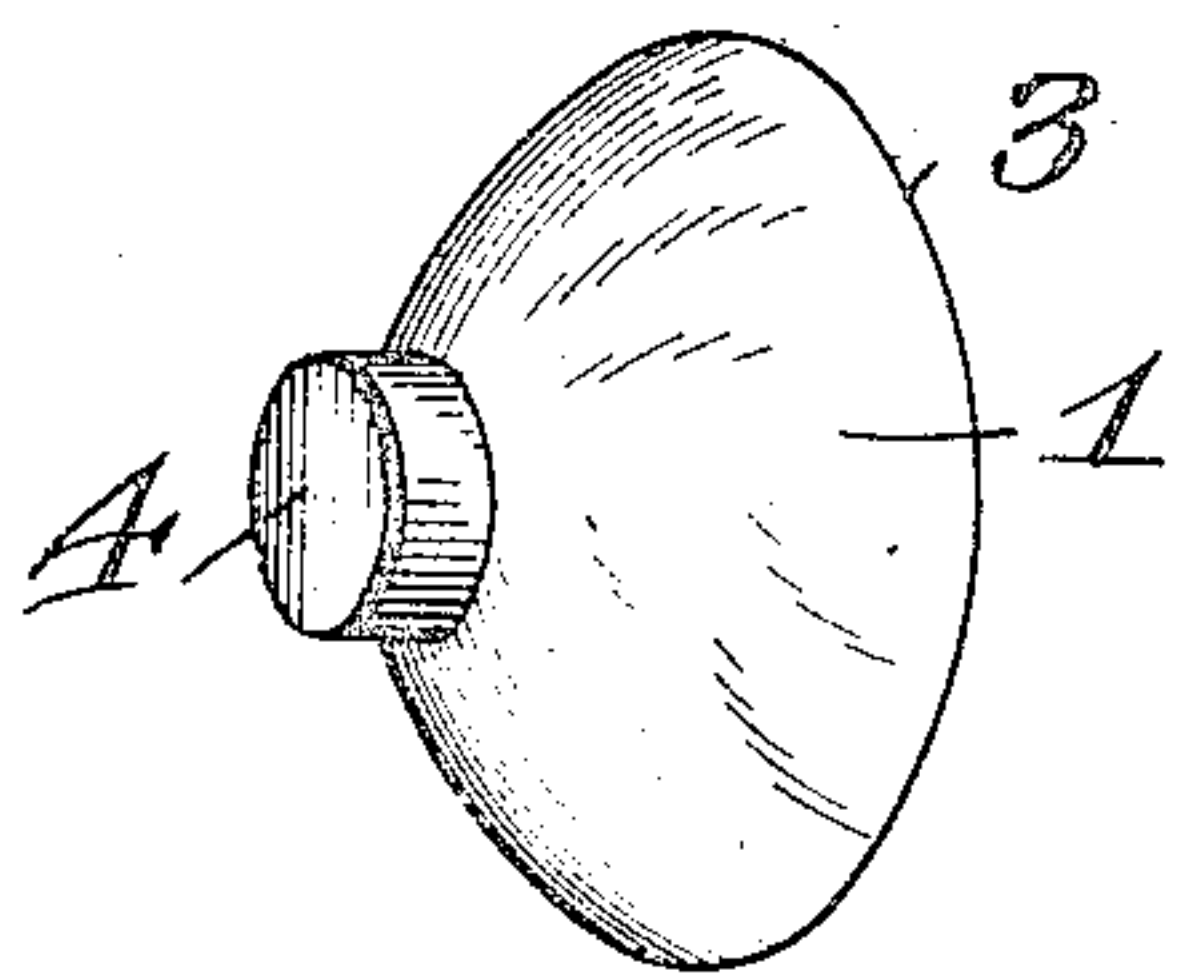
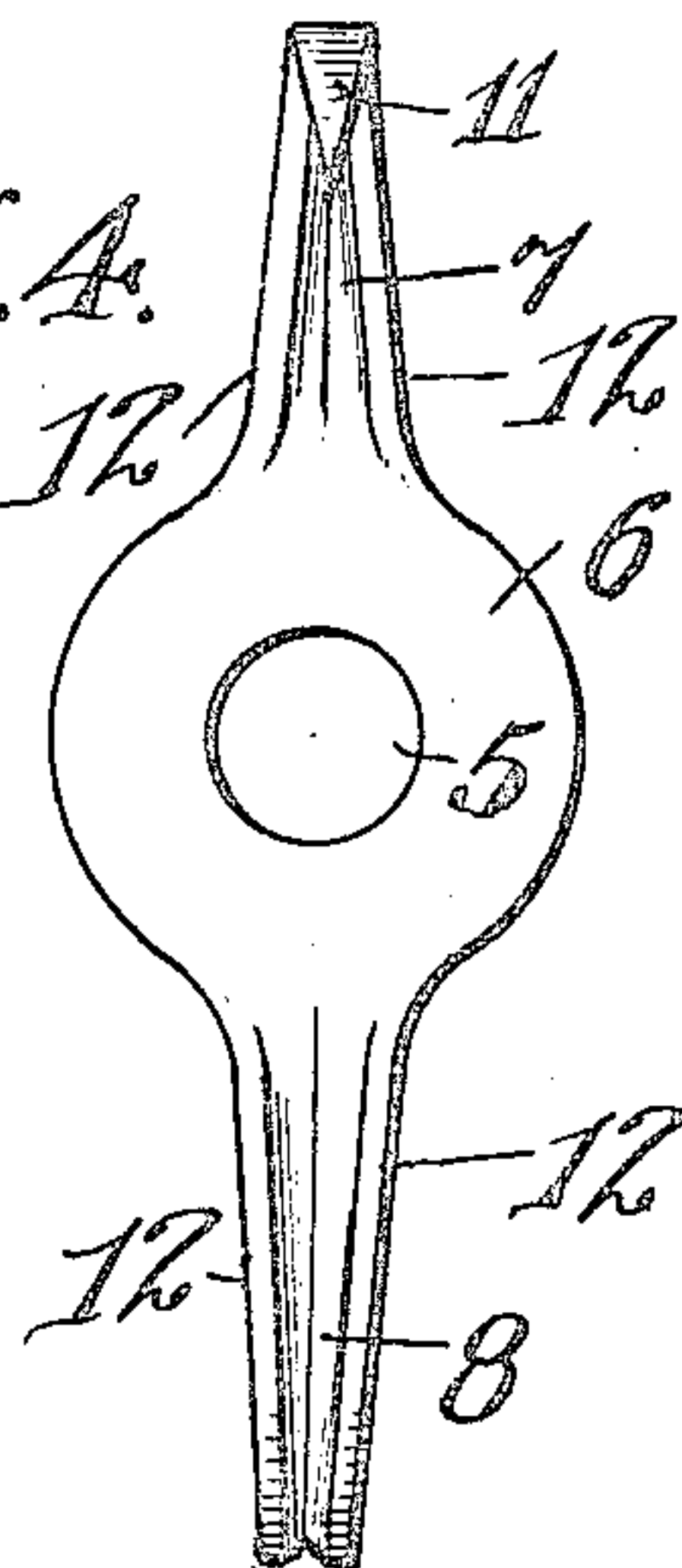


Fig. 4.



Inventor.

Ross Hazelrigg,

Witnesses

H. Joseph Doyle  
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By E. O. Crooman  
his Attorney.



# UNITED STATES PATENT OFFICE.

ROSS HAZELRIGG, OF OAKLAND, CALIFORNIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO VACO MANUFACTURING COMPANY, A CORPORATION OF CALIFORNIA.

## VACUUM SUPPORTING DEVICE.

993,989.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed March 6, 1909. Serial No. 481,855.

*To all whom it may concern:*

Be it known that I, ROSS HAZELRIGG, citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Vacuum Supporting Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to vacuum supporting devices, and has specially in view an improvement in such supporting devices which will tend to make a firm and rigid engagement between the vacuum cup and  
15 the surface to which the same is attached.

In carrying out the invention as generally stated above, it is contemplated employing a vacuum cup which carries spring arms the ends of which engage with the surface to which the cup is attached and exert a pressure which distends the vacuum chamber of the cup so as to increase the vacuum space of said chamber and thereby cause a more firm and lasting adherence between  
20 the cup and the surface to which it is attached.

It will be understood, of course that the invention in its practical application is susceptible of structural changes and variations of details, one preferred and practical example of which is shown in the accompanying drawings, wherein—

Figure 1 is a front view of the improved vacuum supporting device, showing the same in engagement with a window. Fig. 2 is a vertical sectional view thereof. Fig. 3 is a perspective view of the vacuum cup detached from its supporting and distending spring arms. Fig. 4 is a bottom plan view  
35 of the distending spring arms.

Referring to the said drawings by numerals, 1 designates the vacuum cup, which may be of the chambered shape shown with the material of its body tapering to its outer edge, or of any other suitable or preferred shape, the object being to provide a vacuum chamber 2 from which the air is expelled by compressing the cup, after which it is permitted to expand to its normal position or shape while held in contact with the smooth surface to which it is to be attached, in a manner well understood. The tapering formation of the body 1 is preferred, as it greatly facilitates the compressing, or bringing together of the edges 3 of the chamber 2.  
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50  
55

The body 1 is provided with a centrally located outstanding, preferably integral, head 4 which may be in the shape of a cylinder, and which is adapted to be forced through an opening centrally located in the body 6 which is provided with a pair of oppositely projecting integral arms 7 and 8. Said arms and the body are preferably stamped from a single piece of sheet metal and the central opening 5 of the body is punched and its edges are preferably left in an unfinished state so that they will readily "bite" into the material of the head of the cup 1. The spring arms bulge outwardly at their intermediate portions as indicated at 9 to impart resiliency thereto. The ends of the arms project beyond the edge of the vacuum cup, so that when said arms are in contact with the surface to which the cup is attached, a lifting pressure will be exerted upon the cup, which increases the vacuum space of the vacuum chamber in such a manner as to assure of a more firm engagement between the cup and the window or other surface to which the cup is attached. The arm 8 has its end portion which contacts with the window or other surface rounded and outturned to form a suspending hook 10, by means of which articles may be held in a suspended condition. The other arm 7 is provided with a downturned sharpened point 11 which may penetrate an article so as to hold the same between the end of the arm and the surface to which said arm is in contact. It will also be understood that the rounded portion of the arm 8 serves as a clamp to hold an article in engagement with the surface to which the cup is attached. Preferably the sides of the arms have their edges upturned as indicated at 12 which imparts strength thereto.

It will be seen from the foregoing that the cup may be readily formed of rubber or equivalent material molded into the desired shape, and that the arms may be readily stamped from a single piece of material, thus greatly cheapening the production of the device.

What I claim as my invention is:—

1. A device of the character described, comprising a vacuum cup provided with a centrally-located, outstanding head, a body attached to said head and provided with oppositely-disposed spring arms, adapted to contact with the surface to which the cup



is attached to distend said cup, and a suspending hook carried by one of said arms.

2. A device of the character described comprising a vacuum cup adapted for engagement with a smooth surface, and spring arms having rigid connection with the cup, the free ends of said arms being adapted to contact with the surface to which the cup is attached and lift the center of said cup to increase its holding force, said arms being provided, respectively with a suspending hook and a penetrating hook.

3. A device of the character described comprising a vacuum cup having a body which tapers to its outer edge and a centrally located outstanding head, and a body having a central opening through which the head of the cup is forced, said last mentioned body being provided with oppositely projecting spring arms one of which is provided with a penetrating hook and the other with a suspending hook.

4. A vacuum suspending device comprising a vacuum cup having a centrally lo-

cated outstanding head, a metal body provided with a central opening having rigid engagement with the head of the cup, and spring arms integral with the metal body and each provided with a hook-shaped end adapted to contact with the surface to which the cup is attached and exert a lifting pressure on the central portion of the cup to increase the vacuum space of the same.

5. A device of the character described, comprising a vacuum cup, a metal body mounted on said cup, and oppositely-projecting spring arms carried by said body, and adapted to contact with the surface to which the cup is attached and thereby increase the vacuum space of said cup, one of said arms being provided with a penetrating hook and the other with a suspending hook.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

ROSS HAZELRIGG.

Witnesses:

H. C. SCHROEDER,  
F. P. SCHROEDER.