No. 810,216. PATENTED JAN. 16, 1906.

M. A. NEELAND.

VALVE FOR BLOWING ENGINES, &c.

APPLICATION FILED OCT. 19, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

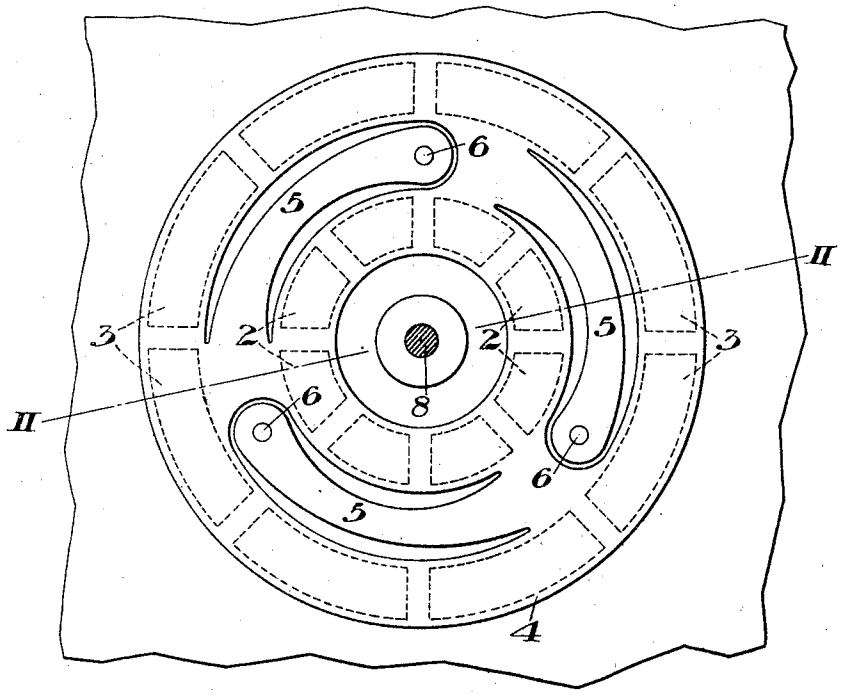


Fig. 2.

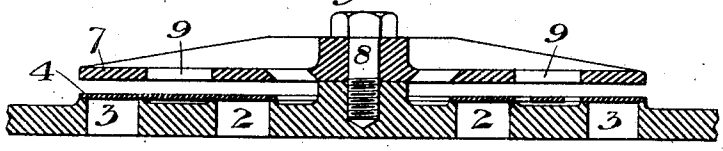
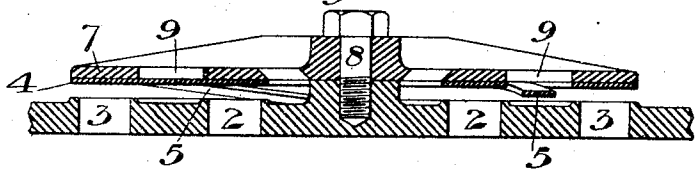


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

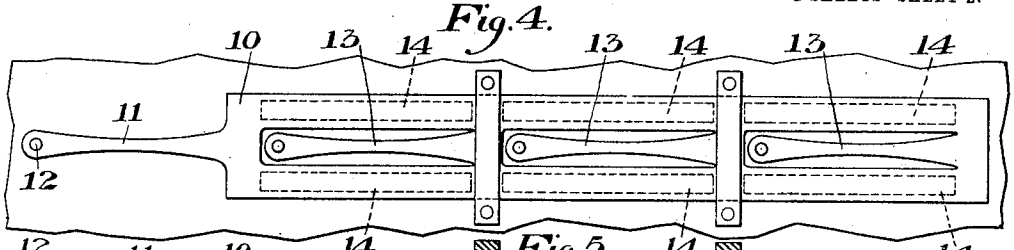


Fig. 5.

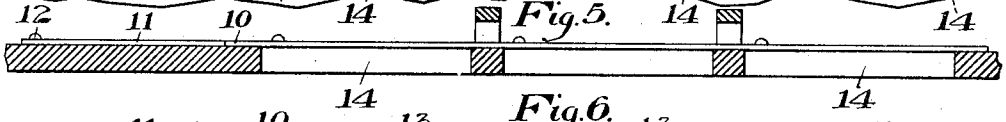


Fig. 6.

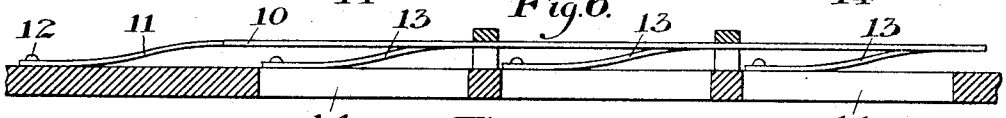


Fig. 7.

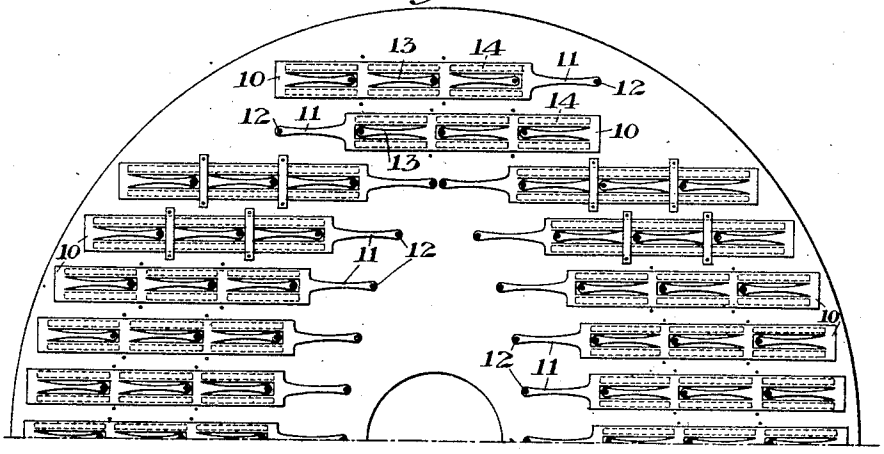
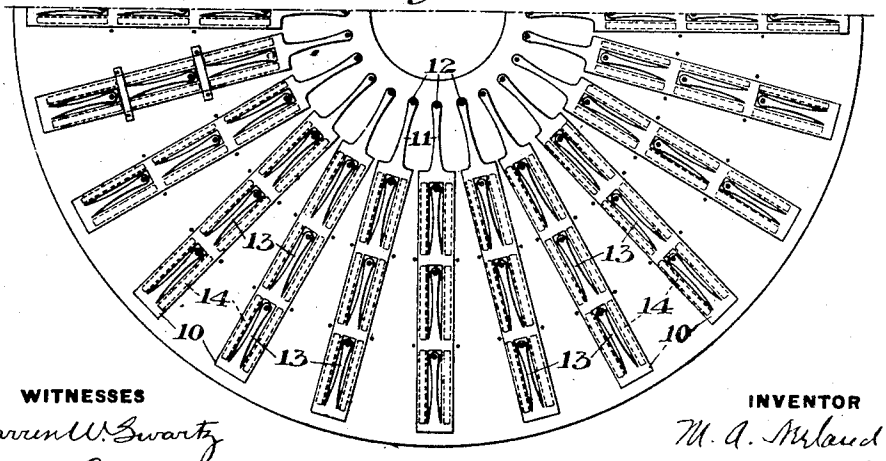


Fig. 8.



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UNITED STATES PATENT OFFICE.

MARVIN A. NEELAND, OF YOUNGSTOWN, OHIO.

VALVE FOR BLOWING-ENGINES, &c.

No. 810,216. Specification of Letters Patent. Patented Jan. 16, 1906.

Application filed October 19, 1904. Serial No. 229,100.

To all whom it may concern:

Be it known that I, MARVIN A. NEELAND, of Youngstown, Mahoning county, Ohio, have invented a new and useful Valve for Blowing-Engines, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view showing one form of my improved valve. Fig. 2 is a cross-sectional view on the line II II of Fig. 1, showing the valve in closed position. Fig. 3 is a view similar to Fig. 2, showing the valve in open position. Fig. 4 is a top plan view showing another form of the valve. Fig. 5 is a longitudinal section of the form of Fig. 4. Fig. 6 is a view similar to Fig. 5, showing the valve in open position; and Figs. 7 and 8 are partial plan views of the head of a blowing-engine, showing different arrangements of the valves of Fig. 4.

My invention relates to that type of valves for blowing-engines and similar apparatus wherein spring portions for thin sheet-metal valves are formed by cutting strips from the valve-body.

The object of the invention is to give a substantially parallel lift to the valve and uniform bending of the valve-strip and to provide guards for the valve which will allow passage of the air therethrough, as well as around the valve.

In the drawings, referring to the form of Figs. 1, 2, and 3, 2 3 represent valve-ports arranged in two annular series. 4 is the valve, which consists of a thin sheet-metal disk with curved spring portions 5 cut therefrom, these curved springs lying intermediate between the two series of ports. As shown in Fig. 1, the side edges of this cut strip are not parallel, but are tapered from both ends toward its central portion. The end portion of each strip is secured by a screw-bolt 6 or other suitable device to the head of the compressor or blowing-engine cylinder. In the rear of the valve is a back-stop 7, consisting of a plate of circular form, secured by a screw-bolt 8, extending through its central portion and through the valve into the cylinder-head. This back-stop is provided with curved ports 9, which are arranged in two annular series out of registry with the ports in the head.

In the normal position of the valve the spring-strips hold the valve in closed position, Fig. 2, and when pressure is brought upon the lower side or suction exerted on the upper side the valve will lift into the position of Fig. 3. In this opening movement, owing to the tapered form of the spring, the bending action of the spring-strips will be uniform and regular, thus preventing excessive strain and injury to the springs. When the pressure or suction is released, the springs again draw the valve to its seat.

In the form of Figs. 4, 5, and 6 the valve is in the form of a rectangular strip 10, having at one end a spring-strip 11, secured at 12 to the valve-seat or cylinder-head. The spring-strips 13 are substantially the same as those of the first form, except that they extend straight instead of on a curve. Their ends are secured to the cylinder-head, as before, and they are placed between the series of ports 14, the closed position being shown in Fig. 5 and the open position in Fig. 6. In Fig. 7 I show one arrangement of these valves of Fig. 4 on a blowing-engine head in which they extend parallel with each other. In Fig. 8 I show another form in which the valves extend radially from the center toward the circumference of the head.

The advantages of my invention result from the tapering form of the integral spring, also from the back stop or guard, which allows the passage of air past each edge of the valve from the closing of the valve by the springs and the substantially uniform lift, due to the shape and arrangement of the springs. The valve is simple and cheap and not liable to get out of order.

Variations may be made in the form and arrangement of the valve, the spring-strips, &c., without departing from my invention.

I claim—

1. In a blowing-engine or compressor, a thin sheet-metal valve having a tapered spring integral therewith; substantially as described.

2. In a blowing-engine or compressor, a thin sheet-metal valve having spring-strips out of registry with the air-ports, said strips being tapered; substantially as described.

3. In a blowing-engine or compressor, a thin sheet-metal plate with integral springs cut therefrom, the end of each spring being secured to the cylinder-head, and the spring being tapered from each end toward its central portion; substantially as described.

4. A blowing-engine or compressor having a valve comprising a thin sheet-metal plate having strip springs cut therefrom and free at one end, and a back-stop having ports in

registry with the springs; substantially as described.

5. In a blowing-engine or compressor, an air-valve consisting of parallel strips of thin sheet metal united at intervals, with tapered springs between and integral with said strips, and a back-stop arranged to limit the lift of the valve and permit passage of air past each edge; substantially as described.

6. In a blowing-engine or compressor, a thin sheet-metal valve having integral strips cut therefrom with their free ends secured to the plate containing valve-ports, and arranged to normally draw the valve to its seat; substantially as described.

In testimony whereof I have hereunto set my hand.

MARVIN A. NEELAND.

Witnesses:
ALICE V. KENDIG,
W. N. ACHBAUGH.