C. H. THOMPSON.

PNEUMATIC ACTION CONSTRUCTION.

APPLICATION FILED APR. 14, 1908.

912,207. Patented Feb. 9, 1909.

Fig. 1.

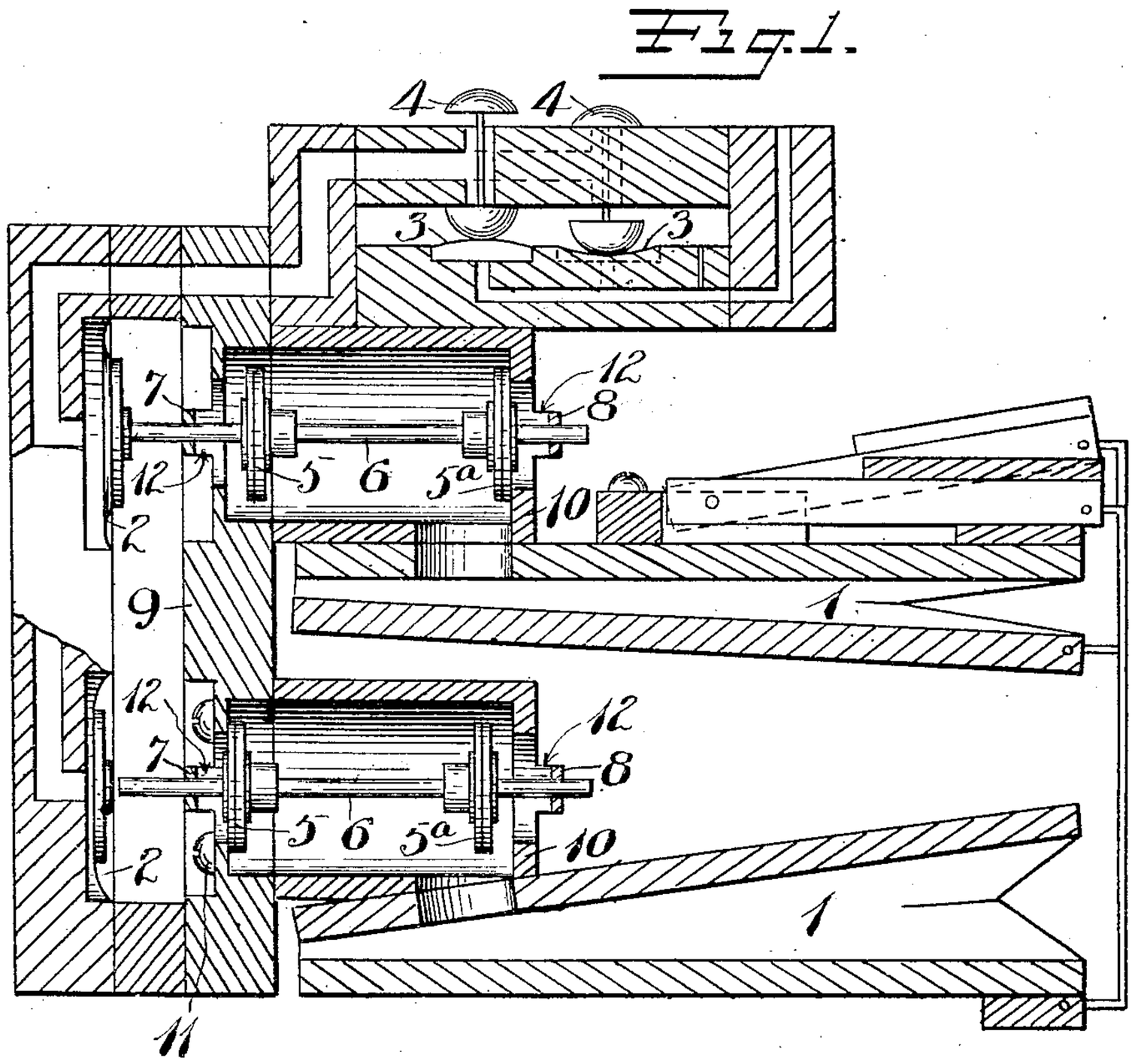


Fig. 2.

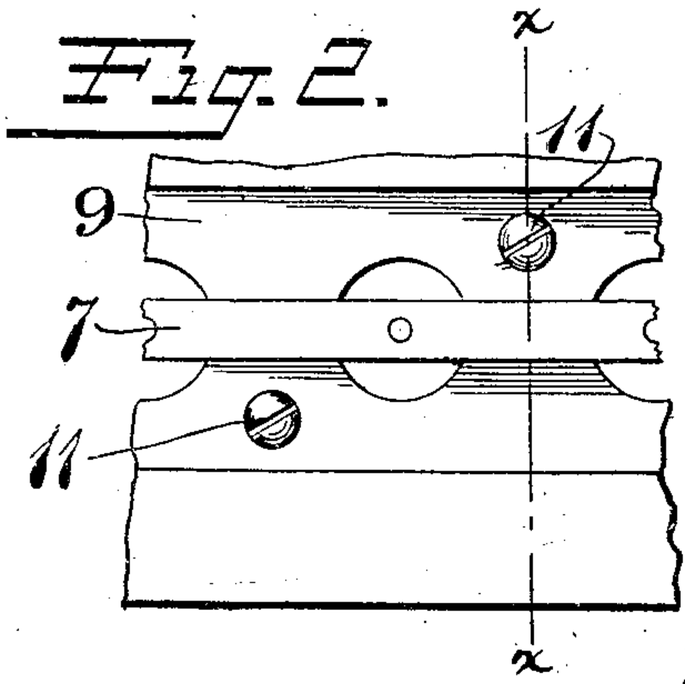


Fig. 3.

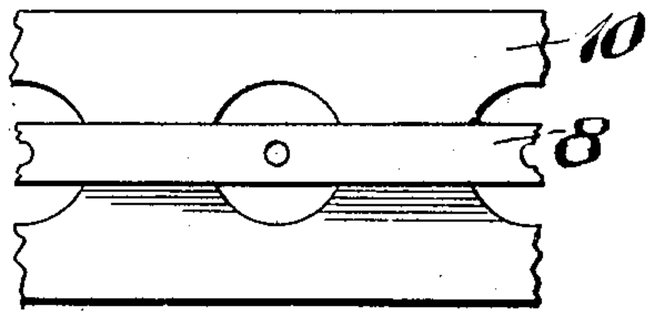
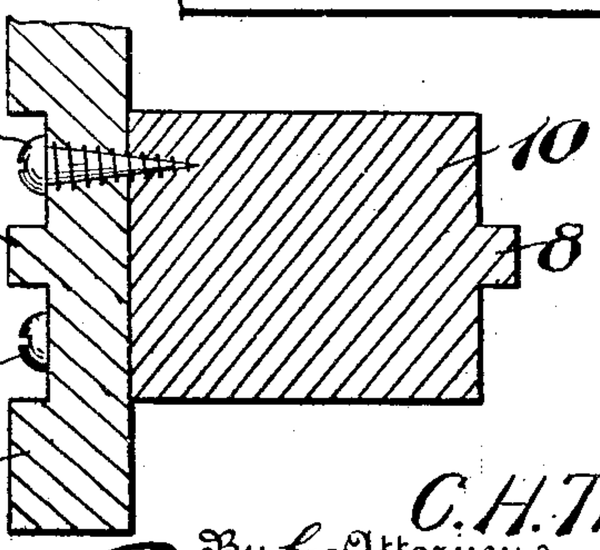


Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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PNEUMATIC-ACTION CONSTRUCTION.

No. 912,207. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed April 14, 1908. Serial No. 426,999.

To all whom it may concern:

Be it known that I, CLYDE H. THOMPSON, a citizen of the United States, residing at Meriden, New Haven county, State of Connecticut, have invented certain new and useful Improvements in Pneumatic-Action Construction, of which the following is a full, clear, and exact description.

My invention relates to improvements in pneumatic music playing instruments, the object being mainly to provide a superior valve-board construction at comparatively small expense.

In the accompanying drawings, Figure 1 is a sectional view of an action of a type to which my invention is adapted; Fig. 2 is a plan view of the valve-board, broken away; Fig. 3 is a similar view of the opposite side thereof; Fig. 4 is a sectional view of said valve-board on the line *x*—*x* of Fig. 2.

It will not be necessary to describe at length the action mechanism proper, it being sufficient to merely refer to the main parts of the same and to state that the action selected for illustration herein is, in the main, of the well-known pneumatic type.

The action includes power pneumatics 1, secondary pneumatics 2, primary pneumatics 3, primary valves 4, and secondary valves including the two valve elements 5—5ª in each set. The valve elements 5—5ª are carried upon a stem 6. One end of each valve stem 6 stands close to the back of its respective pneumatic 2, so that when the latter is distended it will move the stem 6 and shift the position of the valve elements 5—5ª. In Fig. 1, one set of these elements (the uppermost) is shown in the position in which the port controlled by the element 5 is opened, and the port controlled by the element 5ª is closed. The other set of valve elements (the lowermost) is shown in the opposite position, its corresponding pneumatic 2 being collapsed. Each stem 6 is mounted near its ends in the valve guides 7 and 8. These guides are each located just outside of the ports which the valve elements 5—5ª respectively control. Heretofore it has been the practice to make these guide elements in the form of narrow strips separate from the valve-board and glue or otherwise attach the same thereto. This involves not only much labor but this method of connection of the said guides to the valve-board is not durable. The object of my invention is to practically eliminate this labor, heretofore regarded as essential, and to produce a finished structure which shall possess the maximum of durability. To that end, in shaping the valve-board sections, a suitable tool is employed to form an integral external ridge extending across one or more of the ports, and as best seen in Figs. 2 and 3. For example, in Fig. 2, the guide 7 is formed integrally on the section 9 of the valve-board, while in Fig. 3 the guide 8 is formed integrally on the section 10. To form the valve chamber, port and guide passage, I employ a triple diameter cutting-bit and cut into the section 9, for example, to form, by the greatest diameter of the bit, one section of the valve chamber; by the intermediate diameter of the bit, one port into the valve chamber; and by the smallest diameter of the bit, the passage through the guide 7 to receive the stem 6. I then employ the same bit for the purpose of cutting out the section 10 of the valve-board. In this instance, the greatest diameter forms the balance of the valve chamber, the intermediate diameter forms the port for the valve 5ª, and the smallest diameter forms the passage in the integral guide 8 to receive the stem 6. By this construction it will be seen that a vast amount of labor is saved and at the same time the guides 7 and 8, being formed integrally with the guide board, remain a permanent part thereof, uninfluenced by dampness or weather conditions, to the injury of the instrument. While all this is due to the simple expedient of forming the guide strips 7 and 8 integrally with the valve-board sections, it is a feature of distinct novelty and of great advantage.

The valve-board is preferably formed as shown, of the two sections 9 and 10. These sections may be secured together in any suitable manner to furnish an air-tight joint at their meeting edges. Screws 11–11 may be employed to guarantee a firm connection of said parts, there being sufficient stock provided in the material between the adjacent valve chambers to permit of the introduction of such screws as shown in Fig. 4.

In the boring out of the two sections of the valve-board, I preferably have the intermediate section of the cutting-bit extended ahead sufficiently far so that it will not only cut through the wall of the valve-board, but will also slightly undercut each guide 7 and

8, as indicated at 12 (Fig. 1), the purpose being to afford a free air passage.

The section 10 of the valve-board is preferably quite deep so as to give a very long valve chamber, said chamber being preferably of a greater length than twice the diameter of the ports therein. I have found, by this proportion, that the action is practically silent, whereas practical experience demonstrates that in a very short valve chamber, with bearings for the stem 6 comparatively close together, the operation of the valves is distinctly audible.

While I have shown the valve chamber extending partially into each section of the valve-board, for the sake of compactness, this is only a preferred construction, as the valve chamber might be formed wholly in the section 10, for example, as will be clearly apparent.

What I claim is:

1. In a pneumatic action, a valve-board including two sections and having a valve chamber included partly within one and partly within the other section, each section having a port, a guide formed integrally on each section and arranged outside of and slightly away from the port in each of said sections respectively, a valve stem supported by said guides and passing longitudinally through said valve chamber, valve elements on said stem for closing said ports respectively and alternately.

2. In a pneumatic action, a valve board including two sections and having a valve chamber included partly within one and partly within the other section, each section having a port, a guide on each section arranged outside of and slightly away from the port therein, one of said guides being formed integrally with one of said sections, a valve stem supported by said guides and passing longitudinally through the valve chamber, valve elements on said stem for closing said ports respectively and alternately.

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