

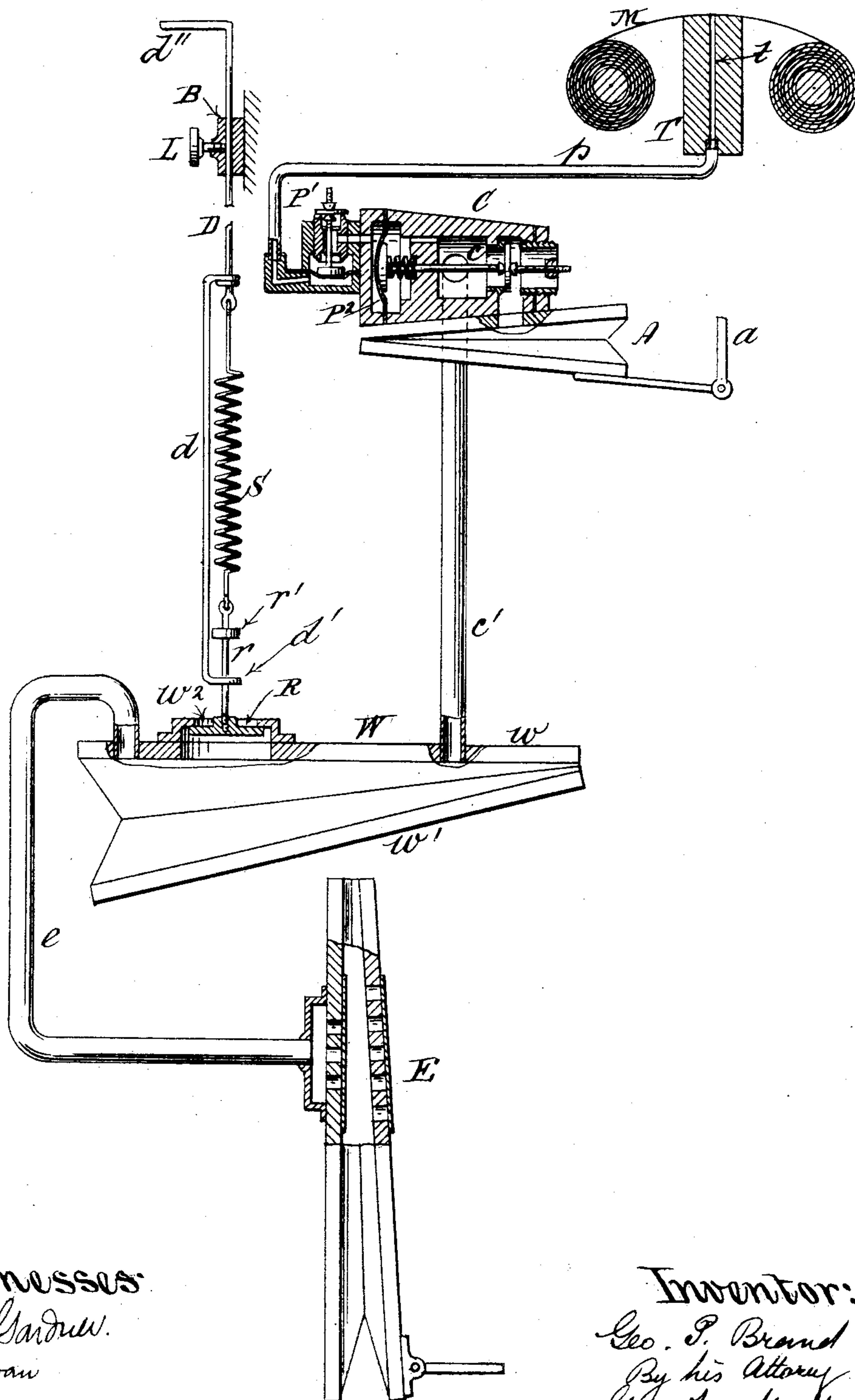
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G. P. BRAND.

RELIEF VALVE FOR TENSION RESERVOIRS FOR PNEUMATIC APPARATUS.

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Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE P. BRAND, OF NEW YORK, N. Y.

## RELIEF-VALVE FOR TENSION-RESERVOIRS FOR PNEUMATIC APPARATUS.

No. 866,837.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed February 10, 1906. Serial No. 300,431.

*To all whom it may concern:*

Be it known that I, GEORGE P. BRAND, a citizen of the United States, residing in the city of New York, borough of the Bronx, county and State of New York, have invented certain new and useful Improvements in Relief-Valves for Tension-Reservoirs for Pneumatic Apparatus, of which the following is a specification.

My invention is applicable to pneumatic players generally, and particularly automatic musical apparatus controlled by the passage of a perforated music sheet over a tracker bar, as in the case of piano players and the like.

The gist of the invention consists in utilizing the relief valve of the tension reservoir as a means of regulating the volume of sound produced by the musical apparatus by increasing or diminishing the resistance to be overcome by said relief valve in yielding to internal tension substantially as hereinafter set forth, whereby maximum loud or minimum soft, or any intermediate effects may be effected by a simple adjustment of a tension rod connected with said relief valve.

In the accompanying drawing I show more or less diagrammatically and in sectional elevation parts essential to the practical application and understanding of my invention, it being understood that I do not confine myself to the specific construction and arrangement of devices indicated, since my variable resistance relief valve may be applied to tension reservoirs used in other pneumatic apparatus with like result,—and without departing from the spirit and intent of my invention in this respect.

The wind chest or tension reservoir W is interposed in the usual way between the exhaust mechanism E of any desired form and construction, and the tension chamber c, of any suitable chest work C.

M, represents a perforated music sheet and T a tracker bar communicating through the opening t, and duct p, with the diaphragm chamber of a primary pneumatic P', arranged to operate a secondary pneumatic P<sup>2</sup>, by which the inflation or deflation of the actuating pneumatic A is effected in a manner well known in the art,—said actuating pneumatic A being connected by a thrust rod a, with a sound producing device or with any other device which it is desired to actuate and control by pneumatic means.

The tension reservoir W, which is essentially a wind chest, is shown in the form of a collapsing pneumatic having a stationary member w, and a movable member w', although this is not essential because my variable resistance relief valve R and connections may be adapted for use in conjunction with any desired form or construction of tension chamber or

reservoir. The conduit e establishes communication between the interior of the tension reservoir W and the exhaust mechanism E; and in like manner communication is established between the said tension reservoir and the tension chamber c in the chest C through the medium of the conduit c'.

My variable resistance relief valve R is shown in the drawings in the simplest form, consisting of a disk seated on the inner edge of a circular opening w<sup>2</sup>, in the stationary member w, of the pneumatic W. To its stem r is attached one end of a coiled spring S, or equivalent mechanical expedient, the other end of said spring S being attached to an adjustable rod D slidable in a stationary sleeve or bearing B in which it is held in a prescribed position by a suitable locking device, as for instance the screw L. It will be seen that the spring S, tends constantly to hold the valve R to its seat, and that the resistance afforded to the opening of the valve R will depend upon the resilient power or tension of strength of said spring, so that by increasing or diminishing such tensional resistance by means of the adjusting rod D, the degree of air tension within the reservoir essential to effect the opening of the valve may be varied. Hence if very loud interpretation of the music is desired the rod D is adjusted to materially lengthen the spring S and increase its tensional resistance to the required degree, whereas if a very soft rendition of the music is required the rod D is adjusted to shorten the spring S, until the desired modulation is attained,—the possible scope of variation being limited only by the power of the exhaust mechanism on one side and the strength of the spring on the other,—it being understood of course that the mean or normal tension within the reservoir is thus set and governed through the medium of the relief valve R. In this connection it is obvious that the main feature of the invention consists in the use of means for varying the resistance afforded to the opening of the relief valve R, and that the spring S while affording a simple and convenient arrangement of parts for effecting the desired end is not necessarily indispensable, since a like result could be attained by the use of a lever connected to the valve stem r, and carrying an adjustable weight as in the case of any ordinary safety valve, or the like, or by the use of flexible cord attached to the valve rod, passing over a pulley adapted to support two or more weights, or any other equivalent mechanical expedient may be resorted to, so that in so far as I am aware, I am the first to use a variable resistance relief valve in pneumatic apparatus in connection with a tension reservoir, I am not restricted to the specific means herein shown.

In practice it is sometimes desirable to positively close the relief valve, and this I provide for in the ar-

5 rangement shown in the drawings, by forming a rigid shoulder  $r'$ , on the valve stem  $r$ , and a loop or extension  $d$ , of the adjusting rod D rigidly secured thereto and formed with a lateral extension  $d'$ , for engagement  
10 with the said rigid shoulder  $r'$ , when the adjusting rod D is moved outward sufficiently to bring the said lateral extension  $d'$ , and said shoulder  $r'$ , into contact, in which position the parts may be set and held by the locking device L. Under these conditions, it will be  
15 seen that the spring S, and relief valve R, are rendered inoperative for the time being. The adjusting rod is preferably provided with a handle or finger piece  $d''$ , to facilitate manipulation.

What I claim as my invention and desire to secure by Letters Patent is, 15

In pneumatic apparatus, the combination of a tension reservoir, exhaust mechanism connected therewith, a relief valve in said reservoir, a shouldered stem attached to said relief valve, a spring attached at one extremity to said valve stem and at the other to an adjustable rod, said ad- 20 justable rod formed with an extension projecting beyond the said spring and adapted to engage with the shoulder on the valve stem, and means for holding said adjustable rod in a prescribed position for the purpose described.

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