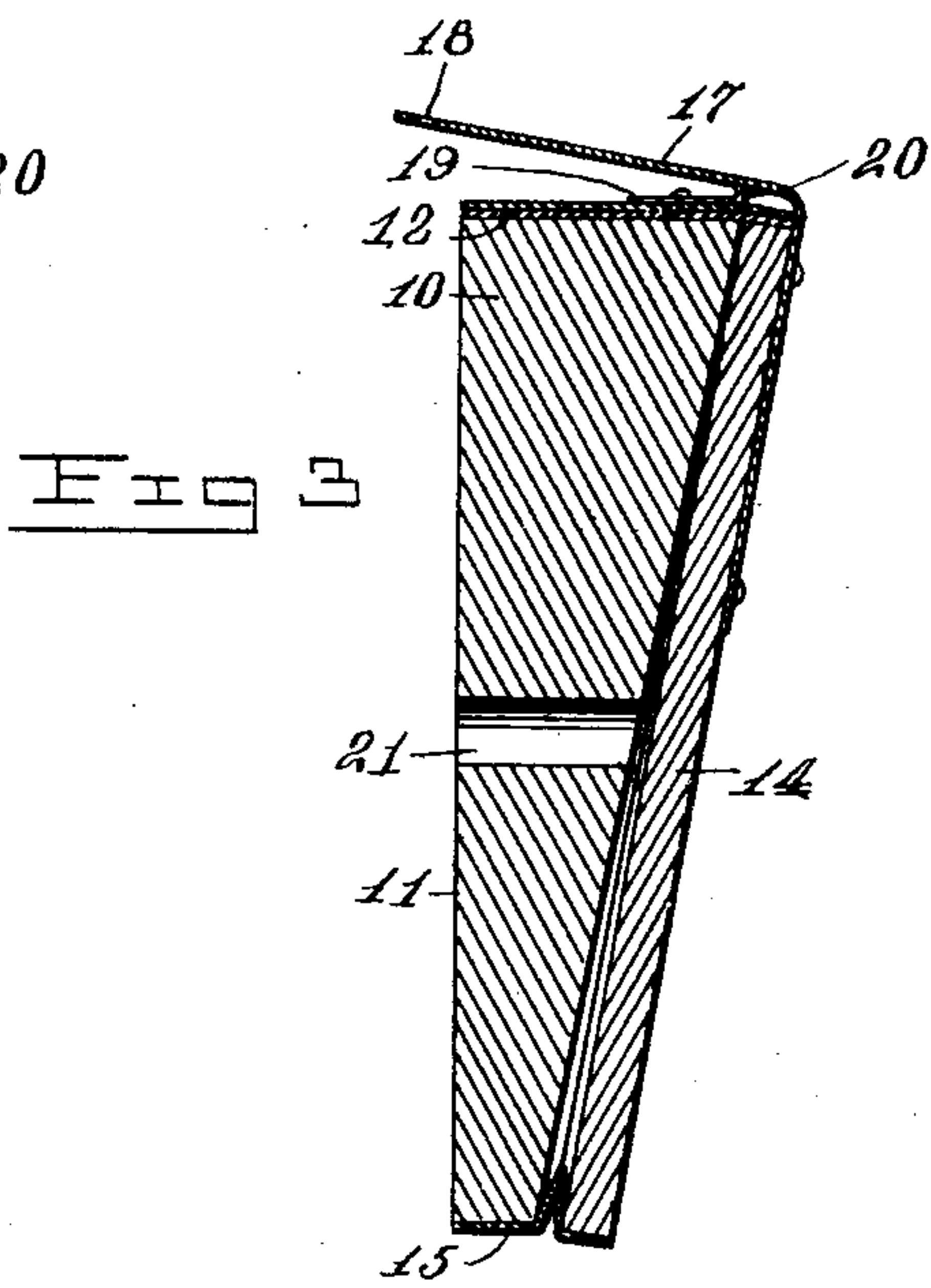
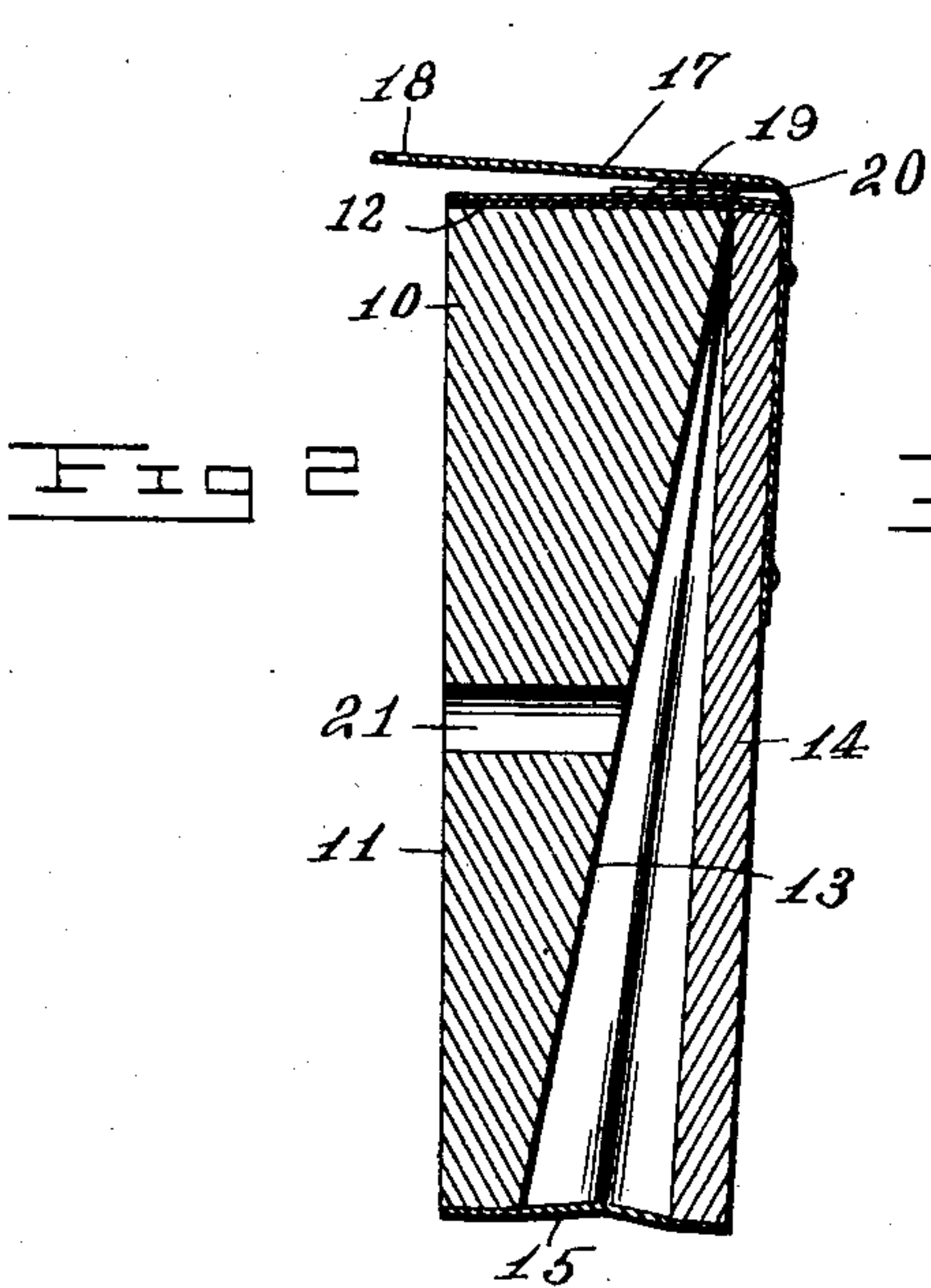
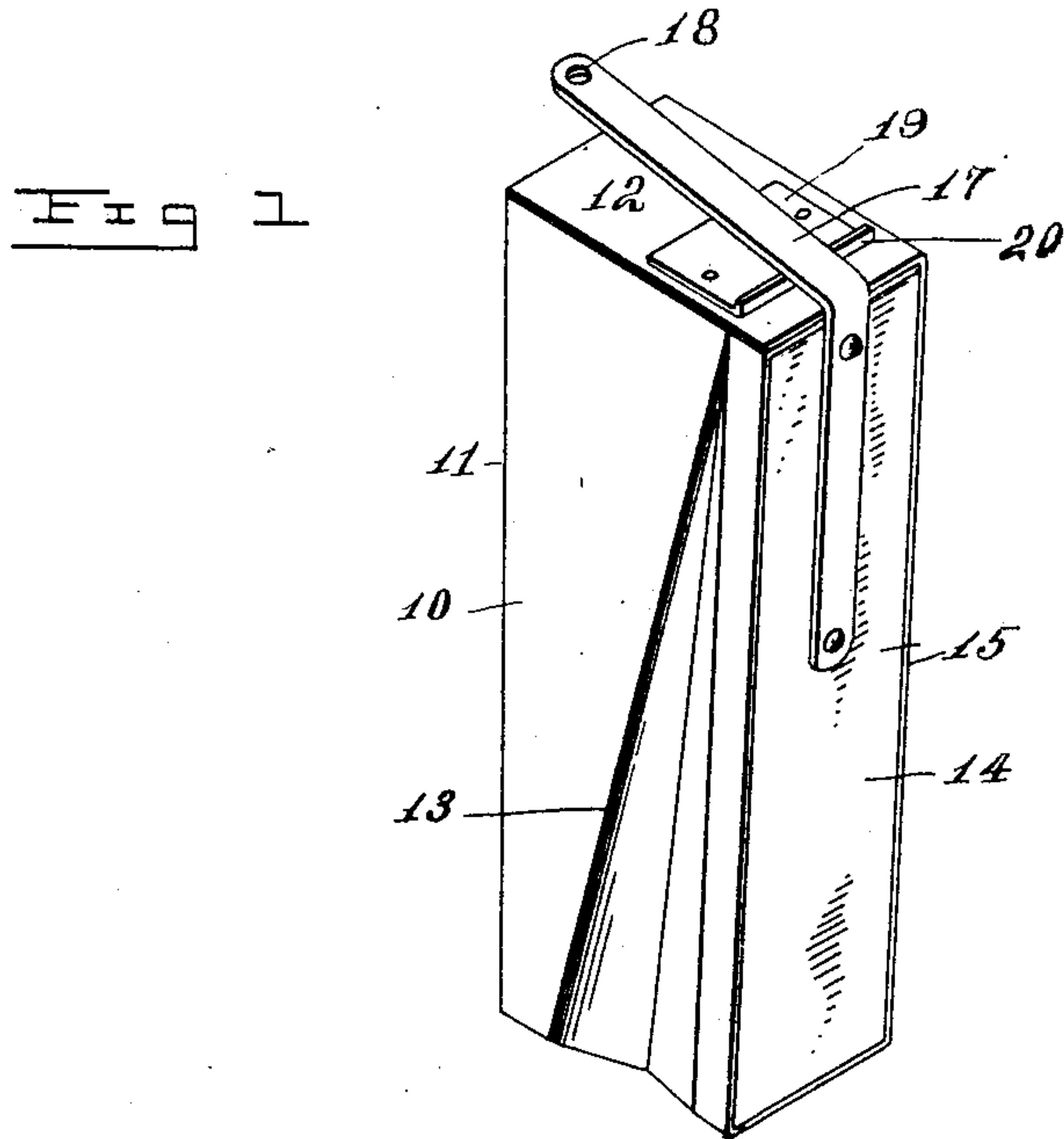


G. S. WILLIAMS.  
POWER PNEUMATIC.  
APPLICATION FILED MAR. 2, 1909.

960,610.

Patented June 7, 1910.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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POWER-PNEUMATIC.

960,610.

Specification of Letters Patent.

Patented June 7, 1910.

Application filed March 2, 1909. Serial No. 480,889.

*To all whom it may concern:*

Be it known that I, GEORGE S. WILLIAMS, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented new and useful Improvements in Power-Pneumatics, of which the following is a specification.

My invention relates to improvements in power pneumatics, and has particular relation to the "bellows" type of such devices.

The principal object of my invention is to provide a pneumatic of this type which is durable in construction, efficient in operation, readily manufactured, and is relatively inexpensive.

A further object is to provide a pneumatic of this type with an arm serving as an actuator, said arm being mounted in a manner to prevent excessive wear on the hinge of the pneumatic, and at the same time to provide for a difference in leverage to permit of a light pressure mechanism for actuating the pneumatic.

To these and other ends, the nature of which will be readily understood as the invention is hereinafter disclosed, said invention consists in the improved construction and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, in which similar reference characters indicate similar parts in each of the views, Figure 1 is a perspective view of a pneumatic constructed in accordance with my invention. Fig. 2 is a central vertical view of the same, the pneumatic being shown as expanded. Fig 3 is a similar view, the pneumatic being shown as collapsed.

In constructing the pneumatic shown in the drawings, I make use of a block 10 having a face 11 and a face 12 extending in planes at right-angles to each other, and a face 13 which extends obliquely to the plane of the face 11, thereby giving the block an approximately wedge-shaped appearance.

14 designates the movable board of the bellows, and which is hingedly connected to the block 10 at the wider end of the latter, as shown in Fig. 2.

The pneumatic is completed by placing a layer of flexible material 15 around the sides and ends of the block and board, said

material being substantially co-extensive with the sides and ends of the pneumatic when the latter is in expanded position, this result being obtained in suitable manner, as by securing one end of the strip of the material to the upper or wider end of the block 12 and the adjacent end of board 14, and then carrying the strip down one side across the bottom up the opposite side and again across the top, thereby providing single layers on the sides and bottom of the pneumatic and a double layer at the top. This construction not only provides for great durability, but is exceedingly easy to manufacture, while the fact that the material is secured to side faces which are relatively large, insures that openings would not be provided at the point where the securing takes place. While the covering is shown as extending over the ends of the boards, the boards may have the usual form of hinge connection over which the cover would extend, the particular form of the hinge being immaterial the invention relating more particularly to the form of the boards and of the actuating device, the purpose of the covering being to provide the pneumatic fold.

17 designates an angular lever which is connected to the upper portion of the board 14, and having its free end formed to be connected to the means to be actuated, such as an operating element in automatic playing mechanism, the lever showing an opening 18 as one way in which this result can be obtained. As will be understood, this angular lever extends over the hinged ends of the pneumatic, and to prevent the free end of the lever from providing excessive wear on the hinge of the pneumatic, I place on the face 12 a plate 19 having an upturned edge 20 which serves as a fulcrum for the free end of the lever, thereby placing the weight of the means to be actuated on the board of extended end-width and thereby distributing it throughout the entire length of the pneumatic instead of on the hinged connection.

The block 10 is provided with an opening 21 which forms the connection between the interior of the pneumatic and the exhaust mechanism.

The pneumatic herein shown is intended to be positioned with its direction of length



extending vertically, being secured to a duct board (where it is employed as a playing pneumatic in an automatic musical instrument), the free end of the lever 17 being of less length than the length of the board 14, thereby including said board 14 as one of the arms of the angular lever, making said arms of unequal length and permitting of a much more efficient operation of the pneumatic. And by making a substantially unitary structure of operating lever and actuator (the lever 17 and board 14) a positive actuating means is provided which is exceedingly sensitive to the various conditions arising in the playing of selections within an automatic mechanical instrument.

As heretofore pointed out, the pneumatic herein disclosed is adapted to be secured to a duct-board with the opening 21 in communication with a particular duct of the duct-board, the pneumatic having its direction of length extending vertically. In connection with this form of mounting of the pneumatic, there is a particular advantage resulting from the provision of the thickened board, the thickened end of the board being located at the top, the advantage consisting in the fact that there is thereby provided a portion which serves to space the outer board from the duct board, and permitting of the use of an angular arm 17 of considerable length, the free end of said arm being located above the duct-board, and thereby providing an exceedingly sensitive pneumatic structure without the necessity of providing an extended space within which the pneumatic may operate.

Having now described my invention, what I claim as new, is—

1. A pneumatic comprising two boards hingedly connected at one end, said boards having a fold-forming covering, and an angular fulcrumed actuator supported by the hinged ends of each of said boards.

2. A pneumatic comprising two boards hingedly connected at one end, said boards having a fold-forming covering, and an angular fulcrumed actuator carried by the hinged end of one of said boards and supported by the other board.

3. A pneumatic comprising two boards hingedly connected at one end, said boards having a fold-forming covering, an angular actuator carried by the hinged end of one of said boards, and a fulcrum carried by the other of said boards.

4. A pneumatic comprising two boards hingedly connected at one end, said boards having a fold-forming covering, an angular actuator carried by the hinged end of one of said boards, and a fulcrum carried by the other of said boards, said fulcrum consisting

of a plate having an upturned edge with which said actuator contacts.

5. A pneumatic comprising two boards, one of said boards having its ends of unequal thickness to provide a substantially wedge-shaped board, said boards having a fold-forming covering and being hingedly connected at the thicker end of said wedge-shaped board, and an actuator secured to the hinged end of one of said boards and overhanging and being supported by the other of said boards.

6. A pneumatic comprising two boards, one of said boards having its ends of unequal thickness to provide a substantially wedge-shaped board, said boards having a fold-forming covering and being hingedly connected at the thicker end of said wedge-shaped board, and an actuator secured to the hinged end of one of said boards and overhanging and being supported by the other of said boards, said actuator being in the form of an angular lever having one arm secured to its board, the free end of the lever overhanging the other board.

7. A pneumatic comprising two boards, one of said boards having its ends of unequal thickness to provide a substantially wedge-shaped board, said boards having a fold-forming covering and being hingedly connected at the thicker end of said wedge-shaped board, and an actuator secured to the hinged end of one of said boards and overhanging and being supported by the other of said boards, said actuator being in the form of an angular lever having one arm secured to its board, the free end of the lever overhanging and projecting beyond the inner face of the other board.

8. A pneumatic comprising two boards, one of said boards having its ends of unequal thickness to provide a substantially wedge-shaped board, said boards having a fold-forming covering and being hingedly connected at the thicker end of said wedge-shaped board, and an actuator secured to the hinged end of one of said boards and overhanging and being supported by the other of said boards, said actuator being in the form of an angular lever having one arm secured to its board, the free end of the lever overhanging the other board, the free arm of said actuator being of less length than the combined length of the other arm and its board.

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

GEORGE S. WILLIAMS.

Witnesses:

J. GRANVILLE MEYERS,  
T. L. VAUGHAN.