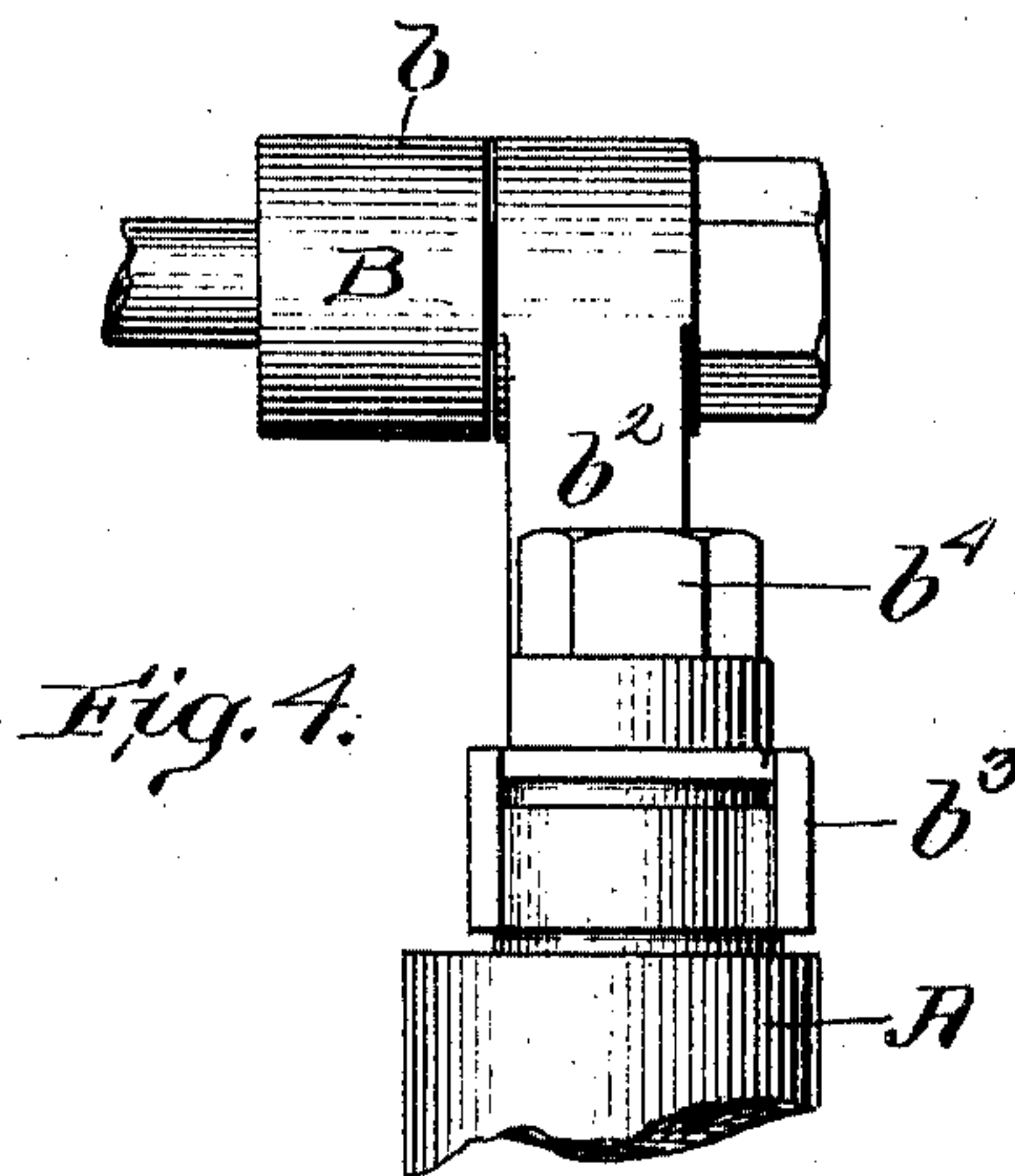
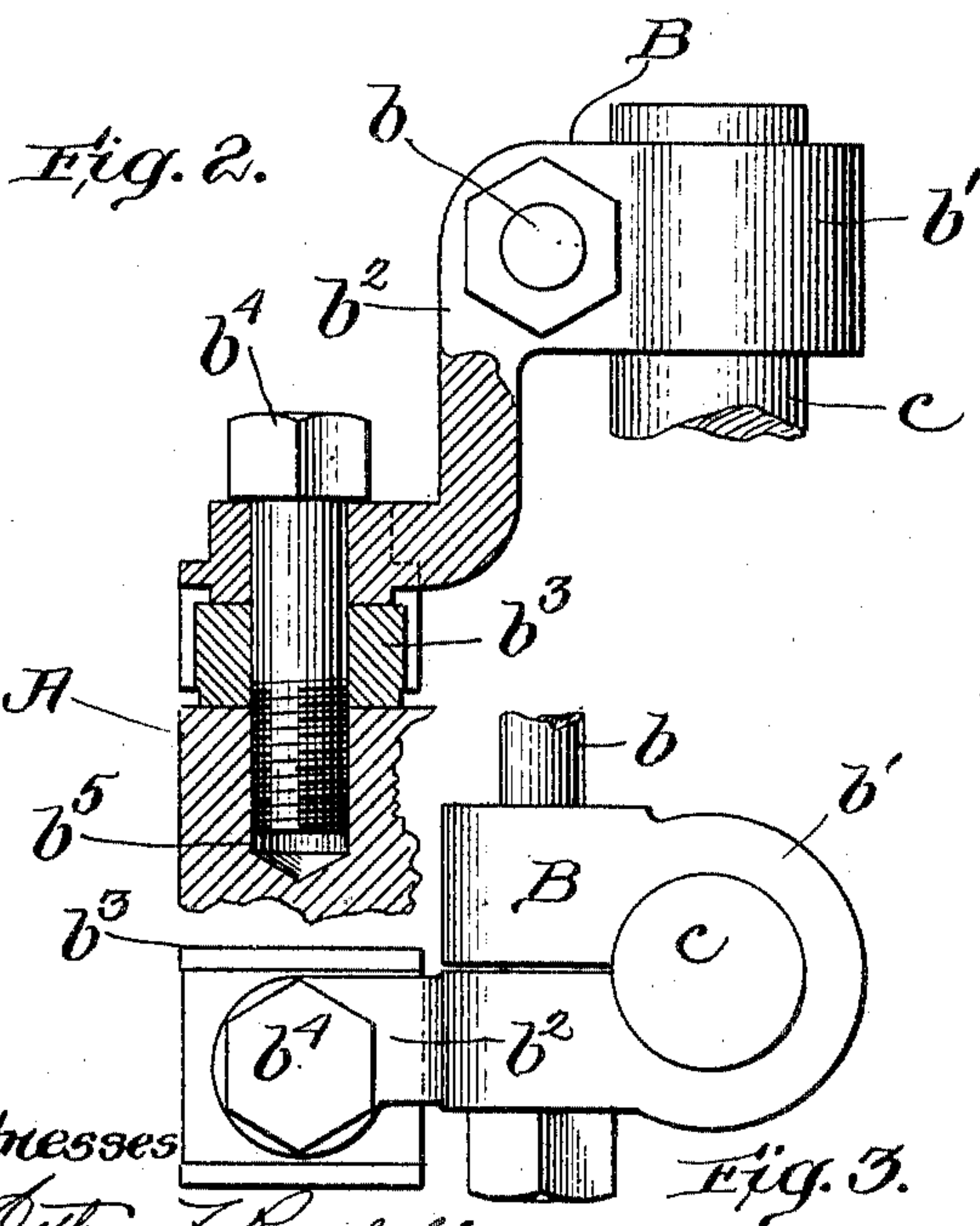
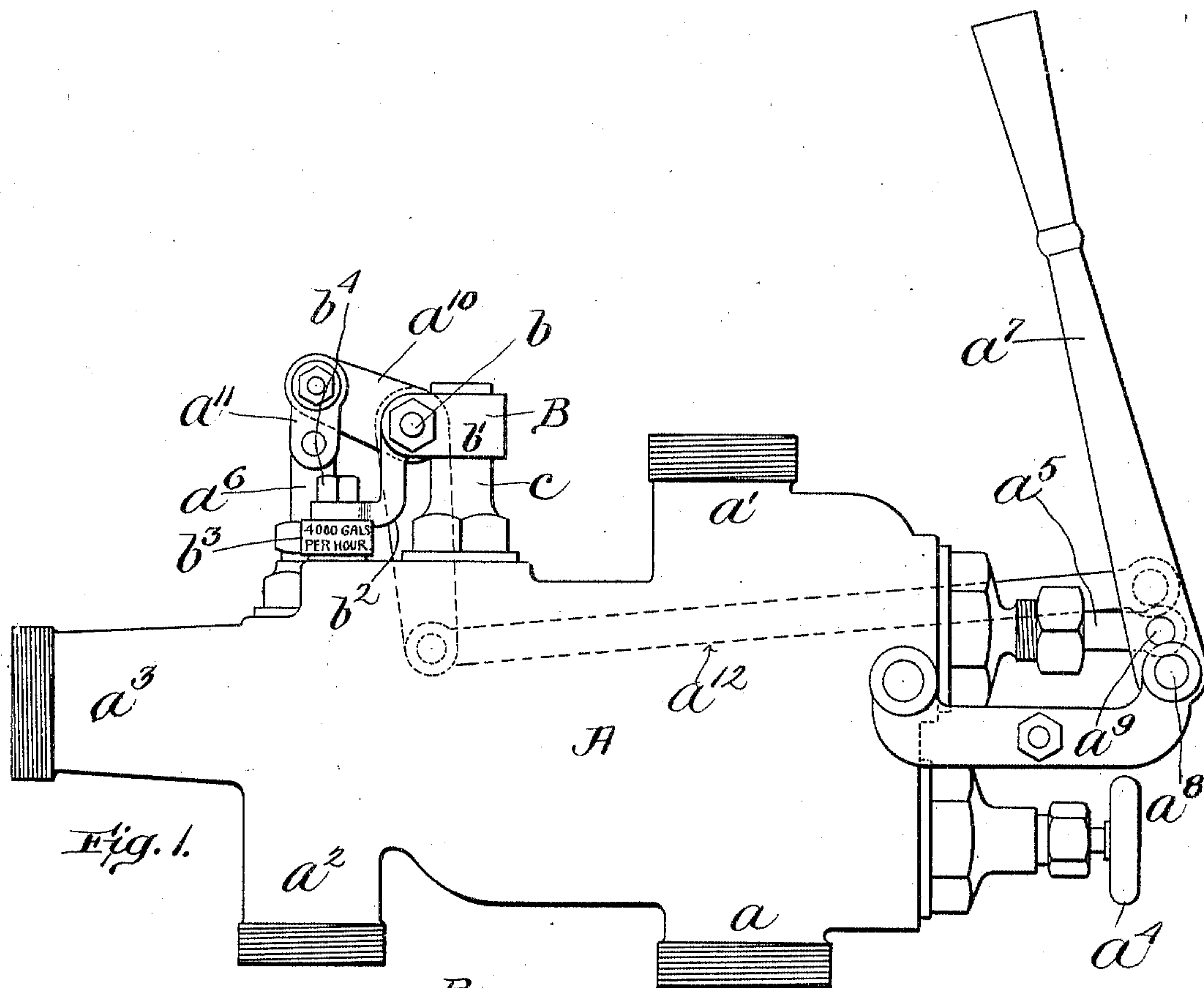


No. 784,066.

PATENTED MAR. 7, 1905.

W. R. PARK.  
INSPIRATOR.

APPLICATION FILED MAY 31, 1904.



Witnesses  
Arthur F. Randall  
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Fig. 3.

Inventor:  
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Attorneys.



# UNITED STATES PATENT OFFICE.

WILLIAM R. PARK, OF TAUNTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED INJECTOR COMPANY, A CORPORATION OF NEW YORK.

## INSPIRATOR.

SPECIFICATION forming part of Letters Patent No. 784,066, dated March 7, 1905.

Application filed May 31, 1904. Serial No. 210,367.

*To all whom it may concern:*

Be it known that I, WILLIAM R. PARK, a citizen of the United States, and a resident of Taunton, in the county of Bristol and State of Massachusetts, have invented new and useful Improvements in Inspirators, of which the following is a specification.

My invention relates to inspirators or injectors, and particularly to that type of injector illustrated in United States Letters Patent to myself, W. R. Park, and B. T. Williston, No. 492,944, dated March 7, 1893, in which the manipulation of a single operating-lever controls the steam-admission valve to the lifting-tubes, the steam-admission valve to the forcing-tubes, and the final overflow-valve. As the steam-admission valves are opened the final overflow-valve is gradually closed, and vice versa, and the overflow-valve when closed upon its seat serves as a stop to limit the movement of the control-lever, and thus determines the ultimate area of the steam-inlet valves. Inasmuch as the inspirator shown in said patent is characteristic of that type of instrument in which my invention is adapted to be used, I will direct my description to an embodiment of my invention in an instrument of that type; but it is to be understood that my invention is not limited in its application to an instrument of this particular form.

The principal object of my invention is to provide means positively and accurately to adjust and proportion the area of the initial opening of the overflow-valve and to time the closing of the same with reference to the opening of the steam-admission valves, and also incidentally to provide means accurately and positively to proportion the area of the ultimate opening of the steam-admission valve for the forcing-tubes, all to accord with the size and capacity of any given set of change-tubes used for the time being in the inspirator.

The capacity of an inspirator or injector is proportionate to the size of the tubes used. For a set of tubes of given size the initial opening of the overflow-valve must be of appropriate size; otherwise the proper measure will not be maintained in the overflow-chamber to insure the starting of the inspirator

when the lifting-tube has raised the water to the proper point and the admission-valve to the forcing-tubes is opened. In order to give the best results, it is also desirable that a proper and proportionate supply of steam be admitted to the forcing-tubes, which is attained by proportioning the ultimate or wide-open area of the steam-admission valve to the forcing-tubes. Hitherto in instruments of this class it has been usual to equip the injector-casing with a set of tubes intended to become permanent parts of the instrument and to proportion the area of the overflow-valve and of the steam-admission valves to accord with the fixed sets of tubes, all the parts being permanently assembled, thus providing an instrument of a single and fixed capacity. It is highly desirable in practice, however, to be able to change the capacity of an injector by changing the tubes, so that an instrument may be provided with several sets of tubes and within reasonable limits may be transformed into an injector of any desired capacity by inserting the appropriate set of tubes.

To secure good results with varying sizes of tubes, provision must be made for correspondingly varying and adjusting the initial area of the overflow-valve opening for the reasons already explained, and this capacity for adjustment must be positive and accurate and must not be dependent upon tests or experiments nor upon the usual degree of skill and care to be expected of the operator. With my invention an unskilled workman can make the adjustment necessary for the tubes of any desired capacity with accuracy, ease, and rapidity.

The improved inspirator containing my invention comprises an overflow-valve and steam-supply valves to the lifting and forcing tubes, both the overflow-valve and the steam-supply valve for the forcing-tubes connected with and operated by a single control-lever, preferably as usual, but differs from inspirators as heretofore constructed in that I have provided therein means for adjusting the connecting means between the overflow-valve and the control-lever to regulate the area of the initial opening of the overflow-valve, which also



regulates the ultimate opening of the steam-admission valve to the forcing-tubes and properly times the closing of the overflow and the opening of the steam valves, all to accord  
 5 with the size of the tubes employed. As herein shown, the capacity for adjustment in this respect is secured by providing a gage-bolster for supporting and positioning the fulcrum-bracket which carries the operating-lever of  
 10 the overflow-valve. This bolster is removable and can be changed for another bolster of a different size, whereby the fulcrum of said operating-lever of the overflow-valve can be shifted and the initial opening of the over-  
 15 flow-valve accurately and positively adjusted.

Other features of my invention and other improvements will presently be pointed out.

In the accompanying drawings, Figure 1 is a side elevation of an inspirator embodying  
 20 one form of my invention. Figs. 2, 3, and 4 are enlarged details of the fulcrum-bracket and gage-bolster hereinafter described.

Having reference to the drawings, A represents the casing of an inspirator,  $a$  being the  
 25 water-inlet,  $a'$  the steam-inlet,  $a^2$  the overflow, and  $a^3$  the delivery.  $a^4$  indicates the steam-valve for the usual duplex lifting-tubes,  $a^5$  the steam-controlling valve for both the lifting and forcing tubes,  $a^6$  the overflow-valve,  $a^7$   
 30 the control-lever fulcrumed at  $a^8$  and pivotally connected at  $a^9$  to valve  $a^5$ ,  $a^{10}$  the operating-lever for the overflow-valve  $a^6$ ,  $a^{11}$  the link connecting lever  $a^{10}$  with valve  $a^6$ , and  $a^{12}$  the link connecting lever  $a^{10}$  and  $a^7$ , all constructed  
 35 and operating as usual.

The operating-lever  $a^{10}$  is fulcrumed upon a pin  $b$ , carried by a bracket B. Bracket B comprises a split hub  $b'$ , mounted upon a post  
 40  $c$ , fast to casing A, and from hub  $b'$  depends a leg  $b^2$ , supported at its lower end upon a gage-bolster  $b^3$ . Leg  $b^2$  and gage-bolster  $b^3$  are fastened in place by a removable clamping-screw  $b^4$ , extending through the leg and the gage-bolster into a tapped hole  $b^5$  in cas-  
 45 ing A.

The gage-bolster  $b^3$ , as will be seen, is removable, and in practice I provide a number of them which are interchangeable; but each differs in thickness or height from the others  
 50 and is adapted and intended to be used only with a set of tubes of a definite and appropriate size—that is, I provide as many gage-bolsters  $b^3$  of different heights as there are different sizes of tubes, and when a set of  
 55 tubes of a definite size is set in place within the inspirator I use a gage-bolster  $b^3$  of a thickness or height appropriate to tubes of that size. Said gage-bolster thus serves to position the fulcrum upon pin  $b$  vertically, so  
 60 that the initial opening of overflow-valve  $a^6$  will correspond to the capacity of the tubes used, and, further, that when valve  $a^6$  is seated valve  $a^5$  will have been opened to an extent sufficient to give the proper supply of steam  
 65 to tubes of that size. It will thus be seen

that by using a bolster  $b^3$  of proper thickness or height the bracket may be fixed in exactly the correct position with ease and despatch and without guesswork or tests.

Preferably each gage-bolster  $b^3$  bears an  
 70 inscription, as shown in Fig. 1, which indicates with what size tube it is to be used and the capacity of the inspirator of which it forms a part.

The leg  $b^2$  besides cooperating with gage-  
 75 bolster  $b^3$  to position the fulcrum-bracket vertically, also cooperates with post  $c$  rigidly to hold the bracket against rotary as well as vertical displacement, whereas heretofore the sole support for the bracket has been the post  $c$ .  
 80

What I claim, and desire to secure by Letters Patent, is—

1. In an injector the combination with the overflow-valve, the steam-controlling valve, the control-lever, the operating-lever for the  
 85 overflow-valve, a connection between the control-lever and the steam-controlling valve, and a connection between the control-lever and said operating-lever, of an adjustable fulcrum-bracket for the operating-lever of the over-  
 90 flow-valve, and a removable, interchangeable gage-bolster for supporting and positioning said bracket relatively to the injector-casing.

2. In an injector the combination with the overflow-valve, the steam-controlling valve,  
 95 the control-lever, the operating-lever for the overflow-valve, a connection between the control-lever and the steam-controlling valve, and a connection between the control-lever and said operating-lever, of an adjustable fulcrum-  
 100 bracket for the operating-lever of the overflow-valve, a removable, interchangeable gage-bolster, interposed between the bracket and the injector-casing for supporting and position-  
 105 ing the bracket, and means for rigidly fastening the bolster to the casing and the bracket to the bolster.

3. In an injector the combination with the overflow-valve, the steam-controlling valve, the control-lever, the operating-lever for the  
 110 overflow-valve, a connection between the control-lever and the steam-controlling valve, and a connection between the control-lever and said operating-lever, of an adjustable fulcrum-  
 115 bracket for the operating-lever of the overflow-valve, and a removable, interchangeable gage-bolster for supporting and positioning said bracket relatively to the injector-casing, said gage-bolster bearing an inscription to indicate the capacity of the instrument of which  
 120 it forms a part.

4. In an inspirator or the like, the combination with the casing, the fixed post on said casing, and the fulcrum-bracket for the oper-  
 125 ating-lever of the overflow-valve adjustably mounted on said post and made with a leg, of a removable and interchangeable gage-bolster interposed between the leg and casing for supporting and positioning said bracket, substantially as described.  
 130



5. In an inspirator or the like, the combination with the casing, the fixed post on said casing, and the fulcrum-bracket for the operating-lever of the overflow-valve adjustably mounted on said post and made with a leg, of a removable and interchangeable gage-bolster interposed between the leg and casing for supporting and positioning said bracket, and means to fasten the leg to the gage-bolster and the gage-bolster to the casing, substantially as described.

6. In an inspirator or the like, the combination with the casing A provided with a post *c* of the bracket B mounted on said post; the gage-bolster *b*<sup>3</sup> and clamp *b*<sup>4</sup>, substantially as described.

Signed by me at Boston, Massachusetts, this 24th day of May, 1904.

WILLIAM R. PARK.

Witnesses:

JOSEPH T. BRENNAN,  
MARY M. DANIHER.