

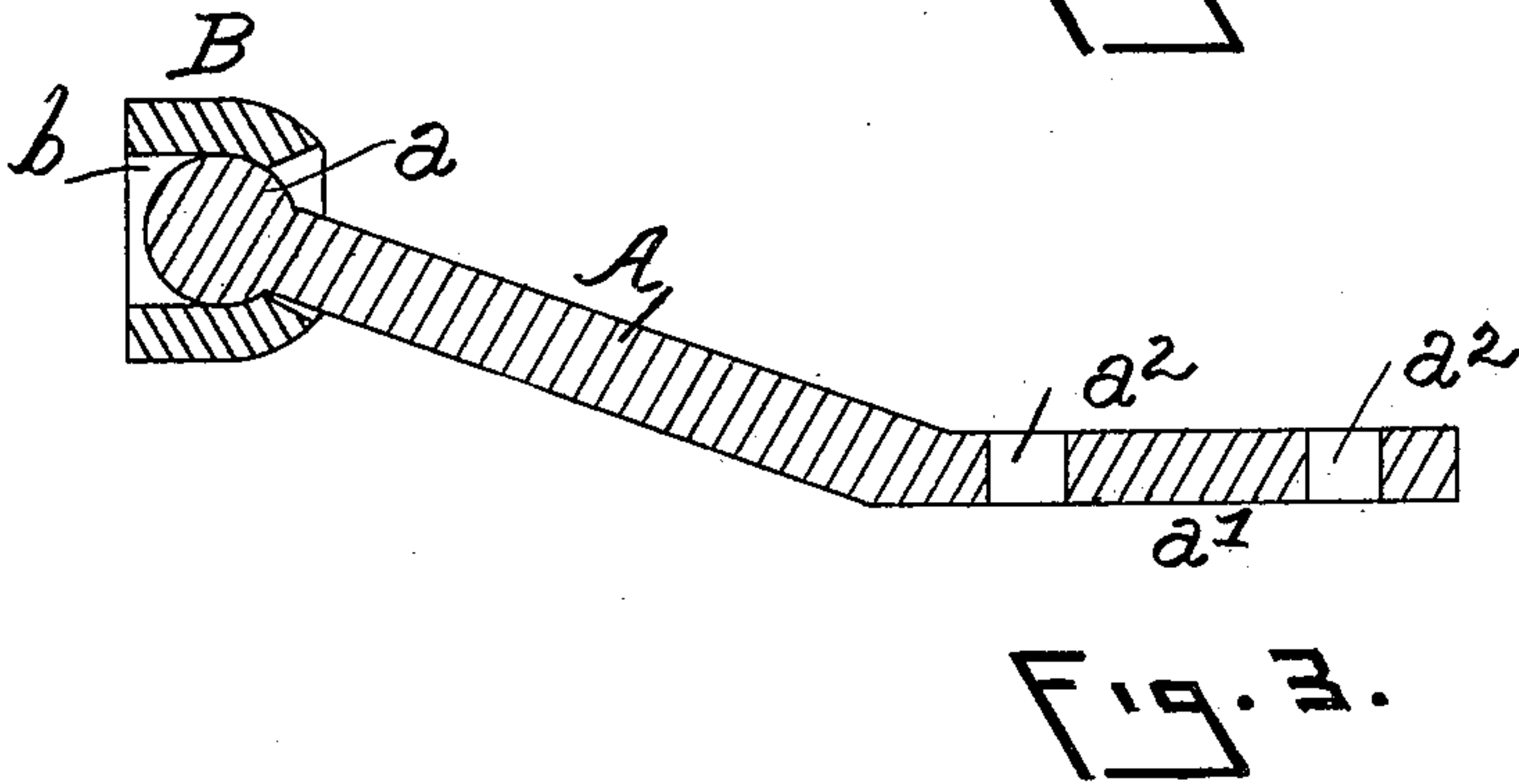
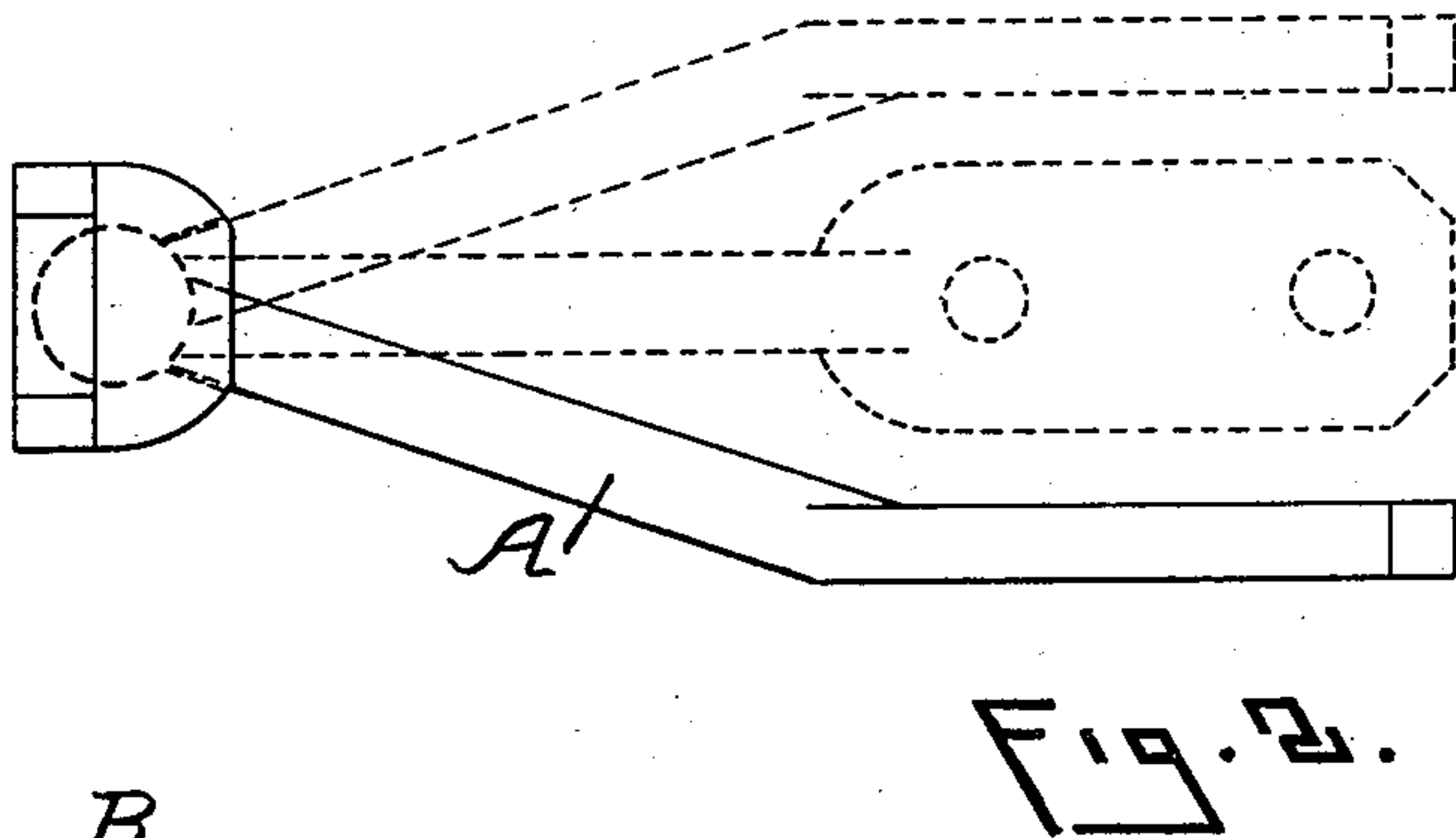
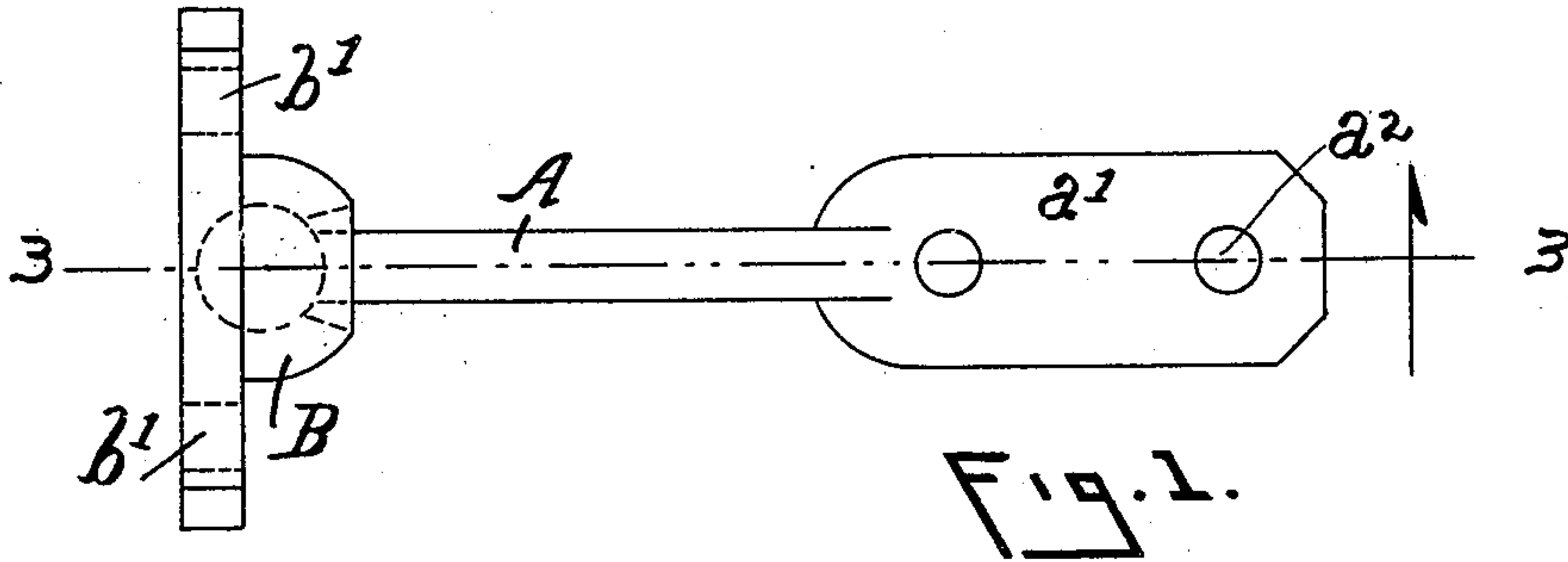
No. 711,916.

Patented Oct. 21, 1902.

H. E. WALLIS.
ADJUSTABLE BRACE.
(Application filed Dec. 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.

Dordyce W. Brown.

R. H. Dooling.

Inventor.

HENRY E. WALLIS.

By Atty.

N. D. B.

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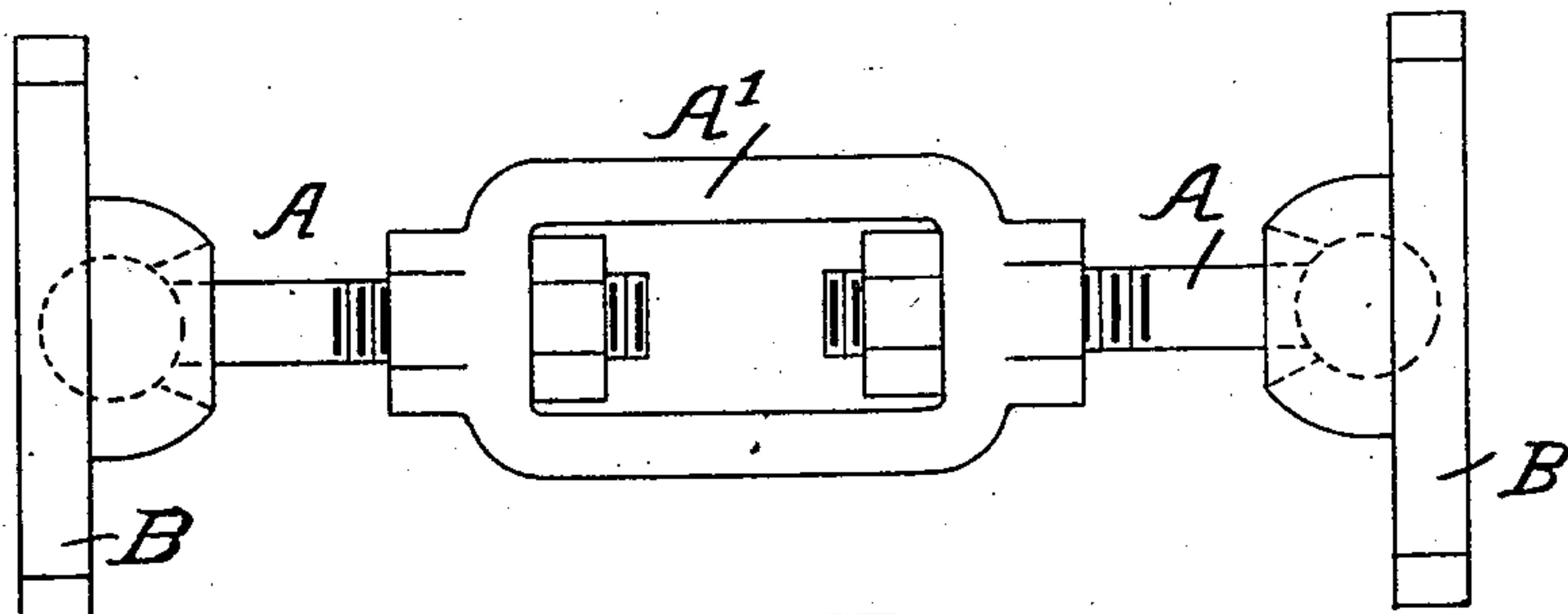


Fig. 5.

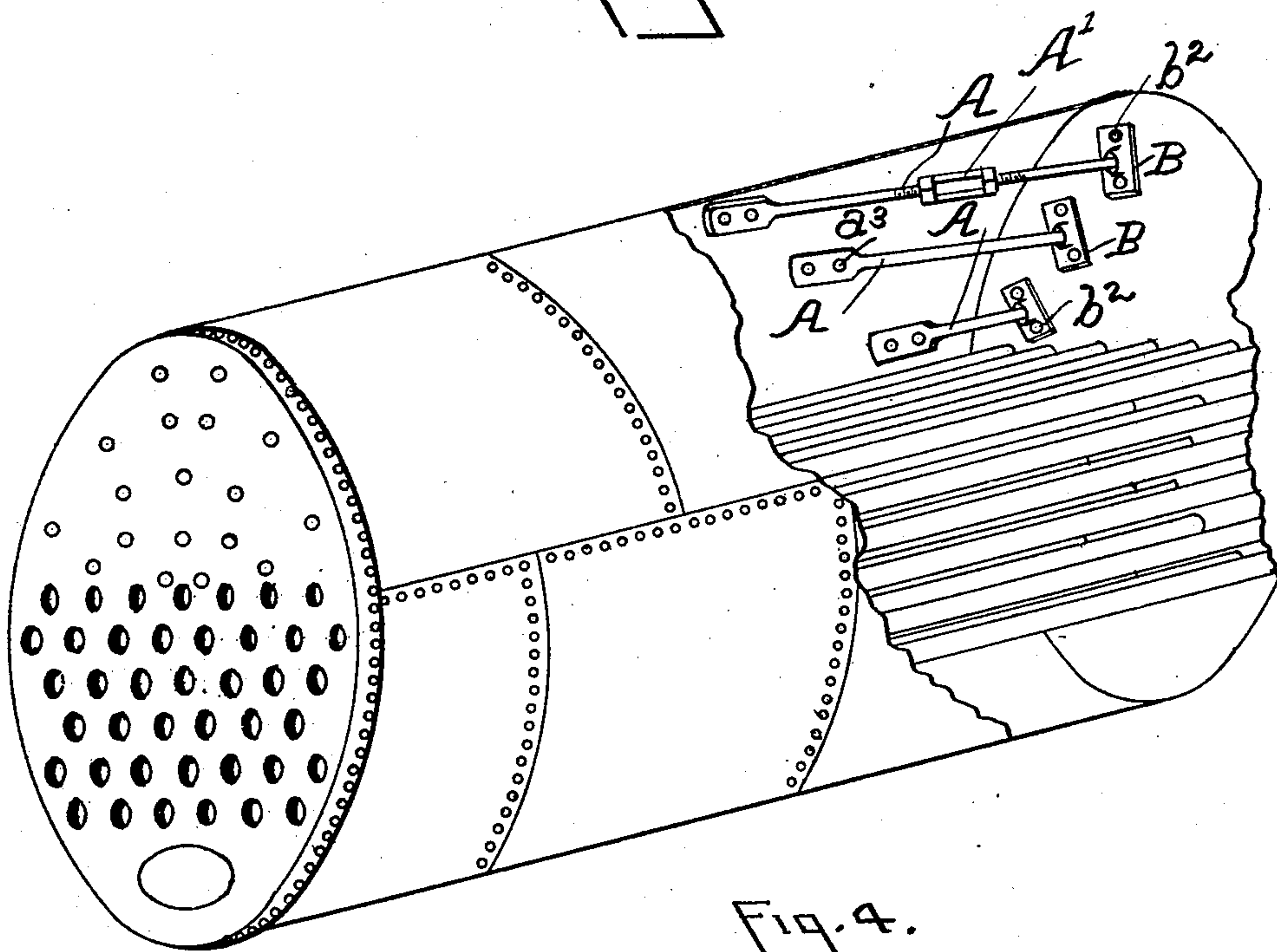


Fig. 4.

Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY E. WALLIS, OF CHICAGO, ILLINOIS, ASSIGNOR OF FORTY-NINE ONE-HUNDREDTHS TO CHARLES S. FLATT, OF SPRINGFIELD, ILLINOIS.

ADJUSTABLE BRACE.

SPECIFICATION forming part of Letters Patent No. 711,916, dated October 21, 1902.

Application filed December 11, 1901. Serial No. 85,493. (No model.)

To all whom it may concern:

Be it known that I, HENRY E. WALLIS, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful

5 Improvements in Adjustable Braces, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

10 My invention relates to braces such as are adapted to strengthen boilers against the outward pressure of water and steam in the boiler, and such as are adapted, speaking generally, to resist strains applied against

15 the article in connection with which the brace is connected in such a manner as to pull against the brace.

The purposes of my invention are to provide a brace adjustable at any desired angle

20 within the scope of the brace and so constructed and arranged as to facilitate the connection of the brace with the thing or apparatus with which it is usable.

With this end in view my invention consists in the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described, and finally recited in the claims.

30 Referring to the drawings, Figure 1 is a top plan of the brace. Fig. 2 is a side elevation and shows in dotted lines revolved positions of the brace. Fig. 3 is a vertical longitudinal section on the line 3 3 of Fig. 1. Fig.

35 4 is a perspective and sectional view of a boiler, showing braces in position therein. Fig. 5 is a top plan of a modified form of the brace.

Similar letters of reference designate like

40 parts in all of the views.

In the drawings I have shown braces of my improved construction as applied to a boiler. It is obvious, however, that the braces may be employed on any structure or in any

45 situation where there is a pull on the brace.

The brace consists of a brace member A and a connecting-plate B. The member A has at one extremity a ball a , which fits in a socket b in the plate B. At the other ex-

50 tremity of the brace, in its preferable form, is a paddle end a' , pierced by holes a^2 , adapted

to receive securing devices for securing the member A on the structure on which it is used. The plate B is pierced by holes b' to receive suitable securing devices. 55

Instead of using a member A having a paddle end a' I may without departing from my invention provide one end of the member A with a screw-threaded part adapted to fit in a nut or turnbuckle, as shown in Fig. 5. 60

In the manufacture of the preferable form of the brace the socket-plate B is first provided, having a socket, also having suitable holes or ways external to said socket to receive rivets or other securing devices for se-

65 curing the plate on the boiler-head. The foot or paddle end a' is then formed on the member A. The member A is then passed through the socket of the plate B until the end of the member projects sufficiently beyond the plate, 70 and the ball a is then swaged on the end of the member A. In the preliminary or unfinished condition of the brace the paddle end a' is without holes, the holes being marked and punched during the process of fitting the 75 brace on the boiler-shell, allowance being made in the punching of the holes for the necessary tension of the brace.

In practical use on a boiler, for example, the plate B is secured to the boiler-head by 80 securing devices b^3 , suitably-placed holes having been previously drilled through the shell of the boiler. The paddle end of the brace having been previously fitted, marked, and punched is then secured on the shell by 85 rivets a^3 or other suitable securing devices.

I have herein shown and described a brace having a ball-and-socket joint; but it is obvious that any other universal joint may be used without departing from my invention. 90

When desired, the brace may, without departing from my invention, be made adjustable by employing a brace member consisting of two sections connected by an adjusting device A' , such as an adjusting-nut or a 95 turnbuckle or equivalent device, as shown in Figs. 4 and 5.

I am aware that stay-bolts having balls fitting in sockets in annular socket-plates screwing into holes in boiler-sheets have been used; 100 but such construction is objectionable on account of the weakening of the boiler-sheets

by holes of the large size necessary to receive the annular socket-plates. I obviate this objection by employing a socket-plate which may be secured to the boiler by rivets or
 5 other suitable securing devices external to the socket, the socket-plate serving to reinforce the boiler-plate at the place of connection.

Having fully described my invention, what
 10 I claim as new, and desire to secure by Letters Patent, is—

1. In a brace of the class described, the combination of a plate provided with a socket and a brace member having a paddle end and
 15 having a ball fitting in the socket of said plate.

2. In a brace of the class described, a plate having a socket and also having ways to receive securing devices in combination with a brace member having a ball fitting in the
 20 socket in said plate, and means for connecting said brace member with the structure to be braced, as set forth.

3. A socket-plate for braces, having a socket adapted to receive a ball, also having ways
 25 adapted to receive securing devices; in combination with a brace member having a ball fitting in the socket of said plate, as set forth.

4. A brace member having a paddle end and a ball end; in combination with a socket-
 30 plate having a socket in which the ball end of said brace member fits and having ways to receive securing devices, as set forth.

5. In a brace of the class described, the combination of a plate having a socket adapted
 35 ed to receive a ball and also having ways for securing devices external to said socket, a brace member having a ball fitting in the socket in said plate and also having a screw-threaded part, and a nut fitting on the screw-

threaded part of said brace member, as set
 forth. 40

6. In a device of the class described, the combination of a socket-plate having a ball-socket and ways for securing devices, a brace
 member having a ball fitting in the socket of
 45 said plate, securing devices securing said plate, and securing devices securing one end of said brace member, as set forth.

7. In a device of the class described, the combination of a connecting-plate attachable
 50 to the inner face of a boiler-plate, means for securing said connecting-plate, a brace member having universal connection with said connecting-plate, and means for securing one end of said brace member to a boiler-plate, 55 as set forth.

8. In a device of the class described, the combination of a connecting-plate attachable to the inner face of a boiler-plate, with a brace
 member attachable to a boiler-plate, one end
 60 of said brace having universal connection with said connecting-plate, as set forth.

9. In a device of the class described, the combination of a reinforcing connecting-plate,
 means for securing said plate on the structure
 65 to be braced, a brace member having universal connection with said connecting-plate, and means for securing one end of said brace member to the structure against which the brace acts, as set forth. 70

In witness whereof I have hereunto subscribed my name at Decatur, Illinois, this
 30th day of November, 1901.

HENRY E. WALLIS.

Witnesses:

W. H. ELWOOD,
 W. E. ADAMS.