

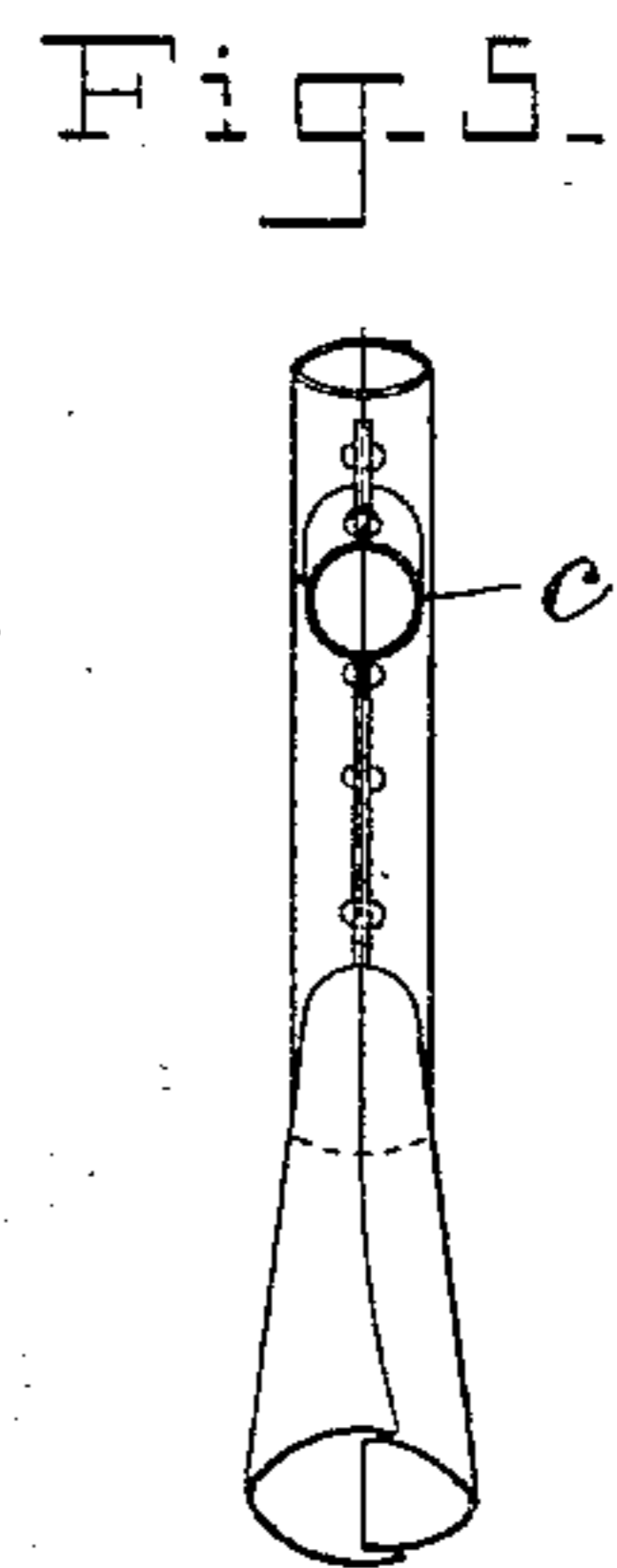
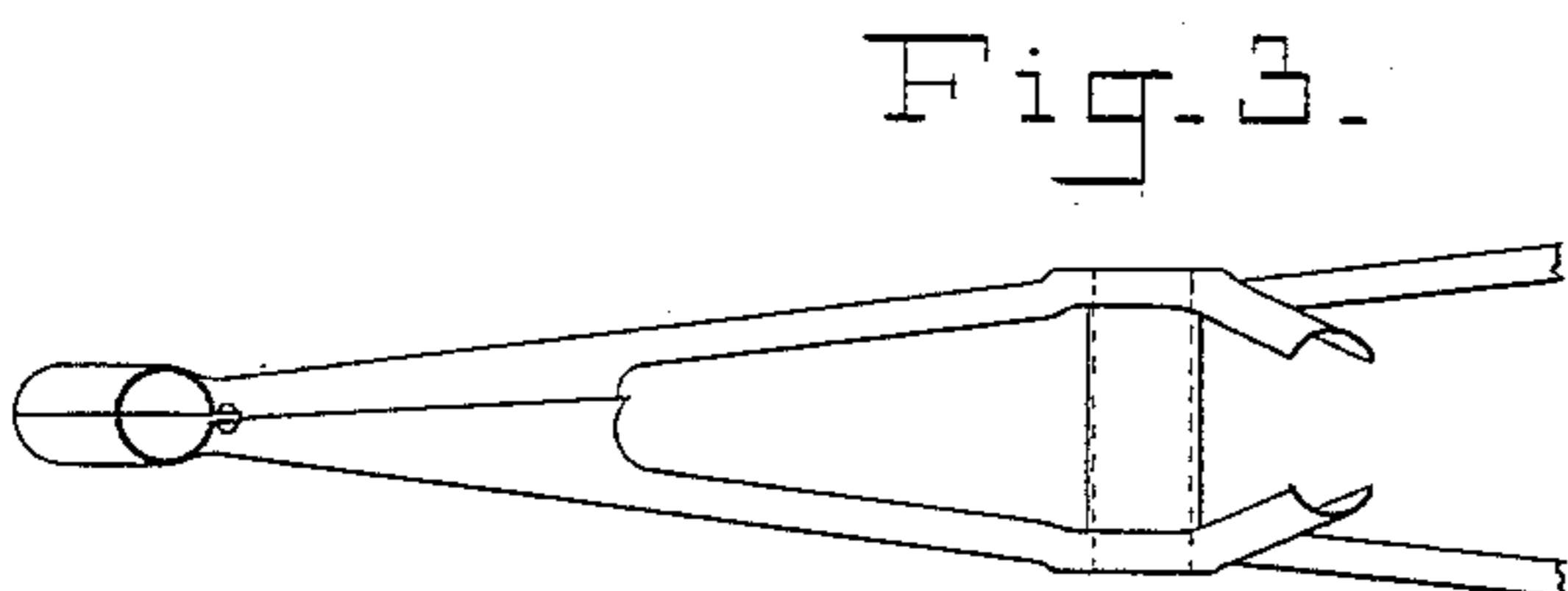
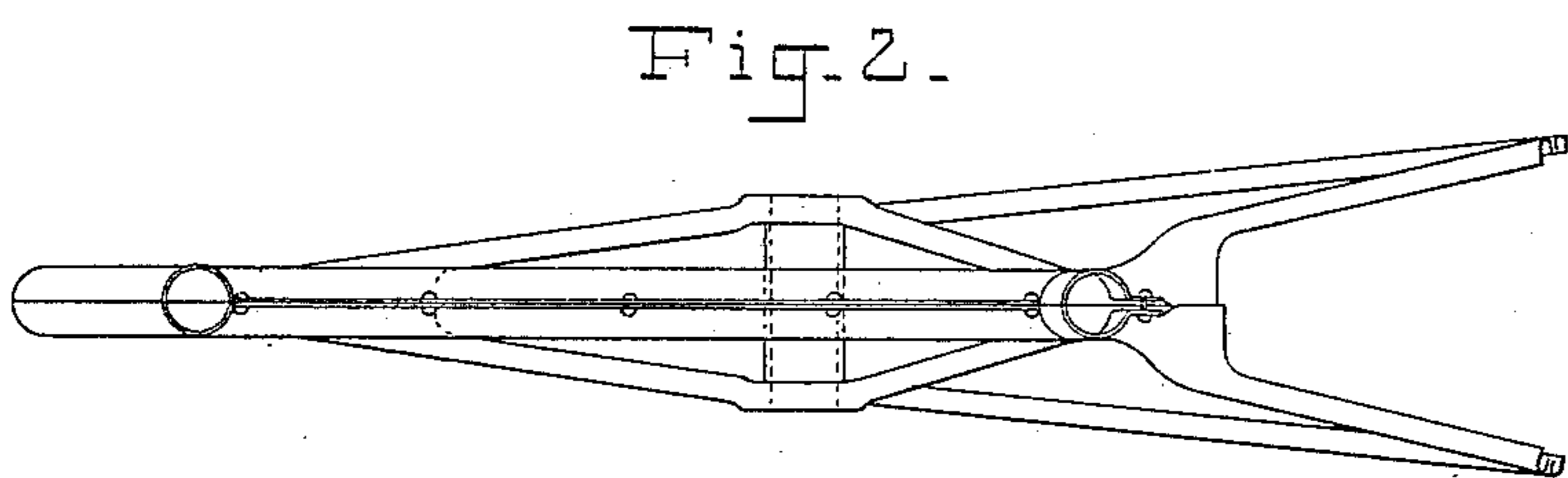
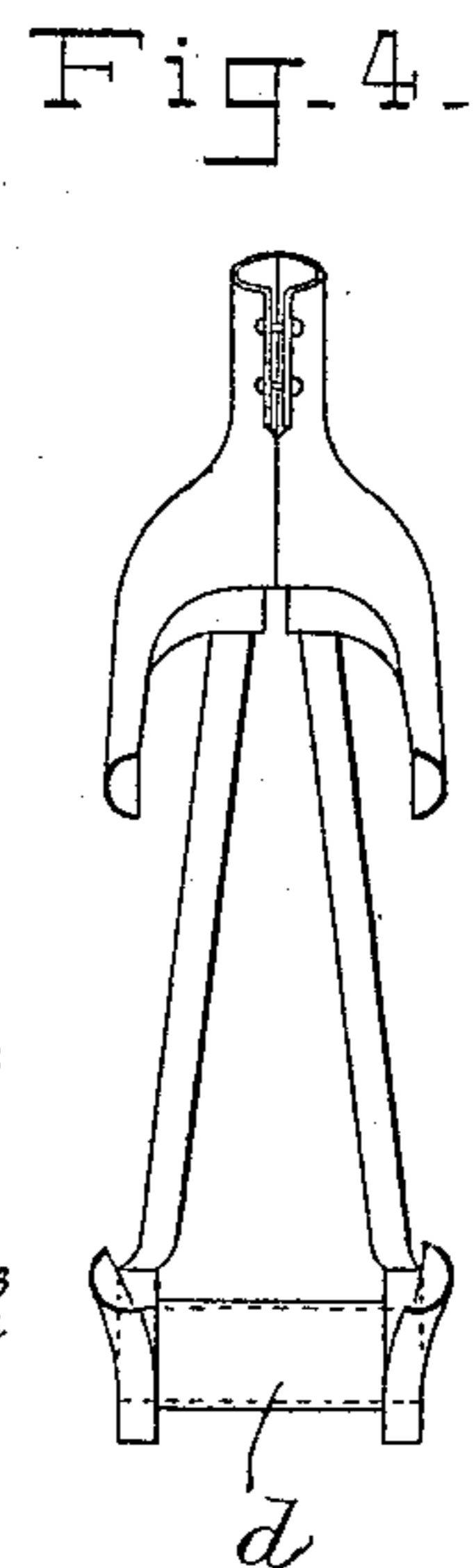
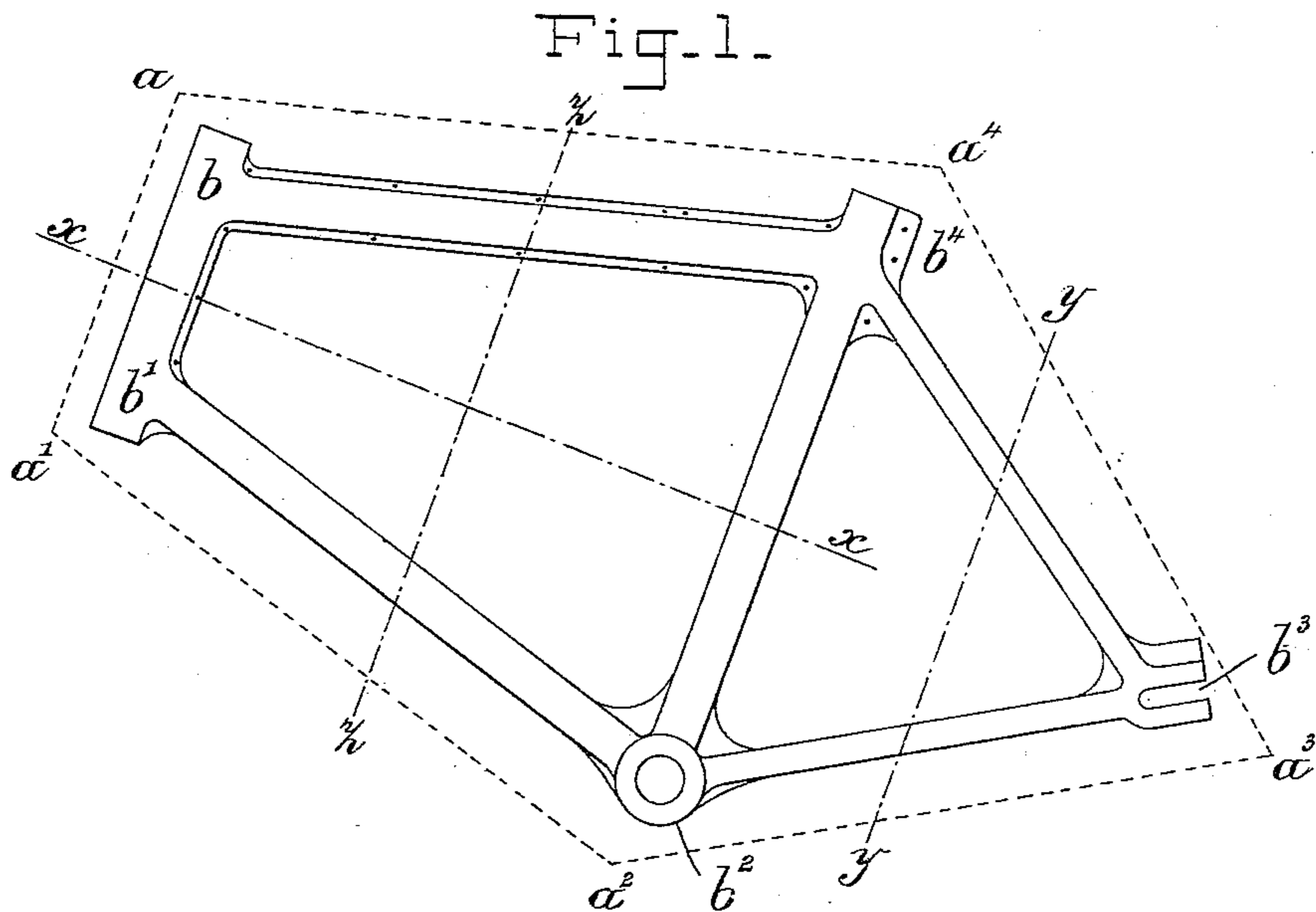
No. 620,787.

Patented Mar. 7, 1899.

J. MACKENZIE.  
FRAME FOR CYCLES.

(Application filed May 14, 1897.)

(No Model.)



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN MACKENZIE, OF MIDDLESBROUGH, ENGLAND, ASSIGNOR TO WILLIAM LAMES, OF BIRMINGHAM, ENGLAND.

## FRAME FOR CYCLES.

SPECIFICATION forming part of Letters Patent No. 620,787, dated March 7, 1899.

Application filed May 14, 1897. Serial No. 636,464. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN MACKENZIE, a subject of the Queen of Great Britain and Ireland, residing at Middlesbrough-on-Tees, in the county of York, England, have invented certain new and useful Improvements in the Manufacture of Frames for Safety and other Cycles, (for which I have obtained Letters Patent in Great Britain, No. 22,417, dated 10 December 7, 1892;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

15 This invention consists of a special way of constructing the frames of safety and other cycles which for cheapness of manufacture are produced in large numbers from the same pattern, but have hitherto been built up of a combination of several separate pieces, consisting of tubes, castings, and stampings joined together as one frame by brazing and soldering.

25 The object of this invention is to dispense with a combination of separate short lengths of tubes, castings, and stampings, together with the brazing and soldering required to form the joints, and to construct the frame of sheet metal stamped, embossed, and cut down 30 in the manner hereinafter described with reference to the annexed sheet of drawings.

In the drawings the several figures illustrate the bare frame in the usual form as used for an ordinary safety-cycle when constructed 35 according to my invention, which frame is to be taken as the representative of cycle-frames generally so far as this invention can be usefully applied to them, it being understood that the economy effected thereby is dependent upon a large turnout of cycles exactly the same pattern in respect of the frame.

40 Figure 1 represents a side elevation of a cycle-frame constructed according to my invention and detached from the rest of the machine. Fig. 2 is a corresponding view in plan; and Figs. 3, 4, and 5 are sectional views taken on lines  $x x$ ,  $y y$ , and  $z z$ , respectively, of Fig. 1.

50 In Fig. 1 the dotted lines  $a a' a^2 a^3 a^4$  are intended to mark out the size and figure of a sheet of metal for stamping and embossing

therefrom a side of the frame  $b b' b^2 b^3 b^4$ , the other side being similarly embossed or stamped from another sheet precisely similar, or if  $a a'$  be taken as the center line of a sheet 55 of metal exactly the double of the figure in dotted lines from this sheet the duplicate of frame  $b b' b^2 b^3 b^4$  could be embossed and stamped out with one half of the duplicate frame lying to the right of line  $a a'$  and the 60 other half to the left, around which line  $a a'$  the duplicate would be bent double and so form both sides of the cycle-frame out of one piece of sheet metal. I will, however, describe the frame shown in the figures as made 65 up of two separate sheets of metal riveted or bolted together, especially about the seat-pillar tube at  $b^4$  and along the front top stay  $b b^4$ , which consists of a uniform circular section with flanged edges, as shown more especially 70 at  $c$  in Fig. 5. The head of the frame is brought together and fastened in the same way as the front-tube stay by means of rivets or solder or by clenching. The sides of the frame are made to diverge toward  $b^2$  for the accommoda- 75 tion of the bottom bracket-tube  $d$  and also toward  $b^3$  for the accommodation of the driving-wheel fork.

It will be observed from the figures, and more especially from the sectional views in 80 Figs. 3, 4, and 5, that the several members of the frame are stamped in the form of a half-circle in sectional area, so that when opposite parts of the frame are close together their combined form in sectional area becomes a 85 full circle. In this way I combine in my cycle-frames the requisite lightness and rigidity, with a very simple mode of construction and fewness of parts, and I do not confine myself to the particular arrangement of parts shown 90 nor to the use of my invention with one class of cycles only, as the hereinbefore-described mode of construction can be adapted to a variety of forms and designs of cycle-frames, as well as to the particular form illustrated 95 in the drawings.

Having now described my invention, what I desire to claim and secure by Letters Patent in the United States is—

As an article of manufacture, a skeleton 100 frame for a bicycle, composed of vertical halves, stamped from thin sheet metal, and

each embossed into a concavo-convex form  
longitudinally of the members thereof, with  
flat flanges along portions of said members;  
the said halves having their concave sides  
5 fitted together and secured by bolts or rivets  
passing through said flanges, substantially as  
described.

In testimony whereof I affix my signature  
in presence of two witnesses.

JOHN MACKENZIE.

Witnesses:

CHRISTOPHER CARLING,  
GEORGE JAMES CLARKSON.