

No. 606,840.

Patented July 5, 1898.

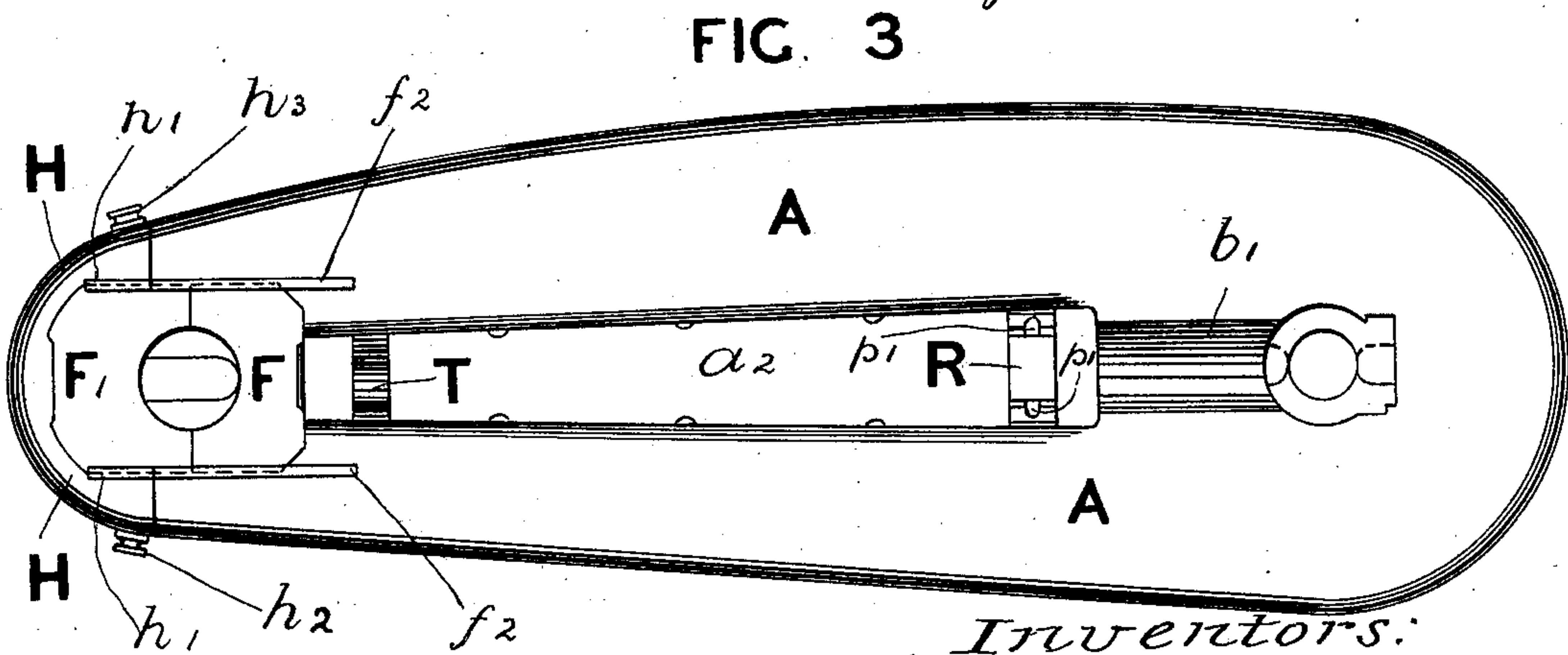
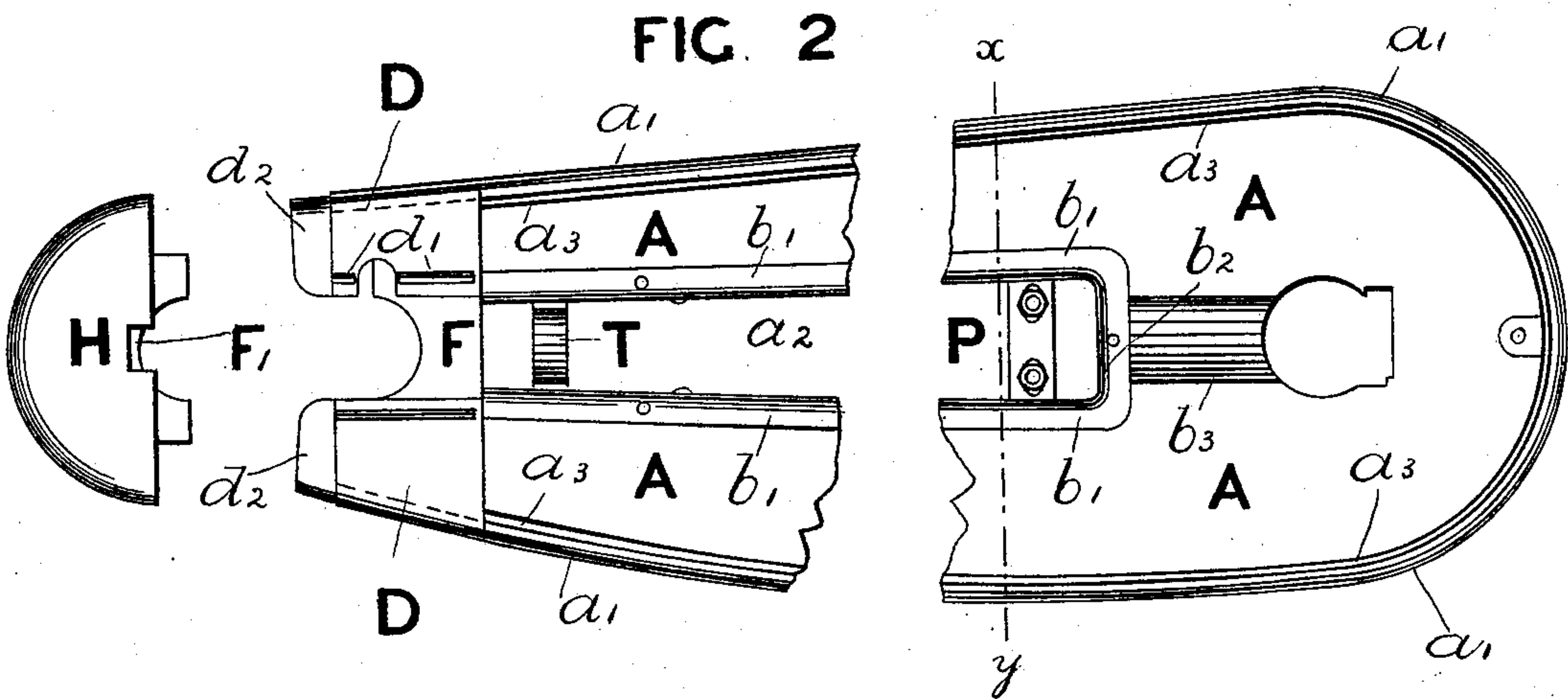
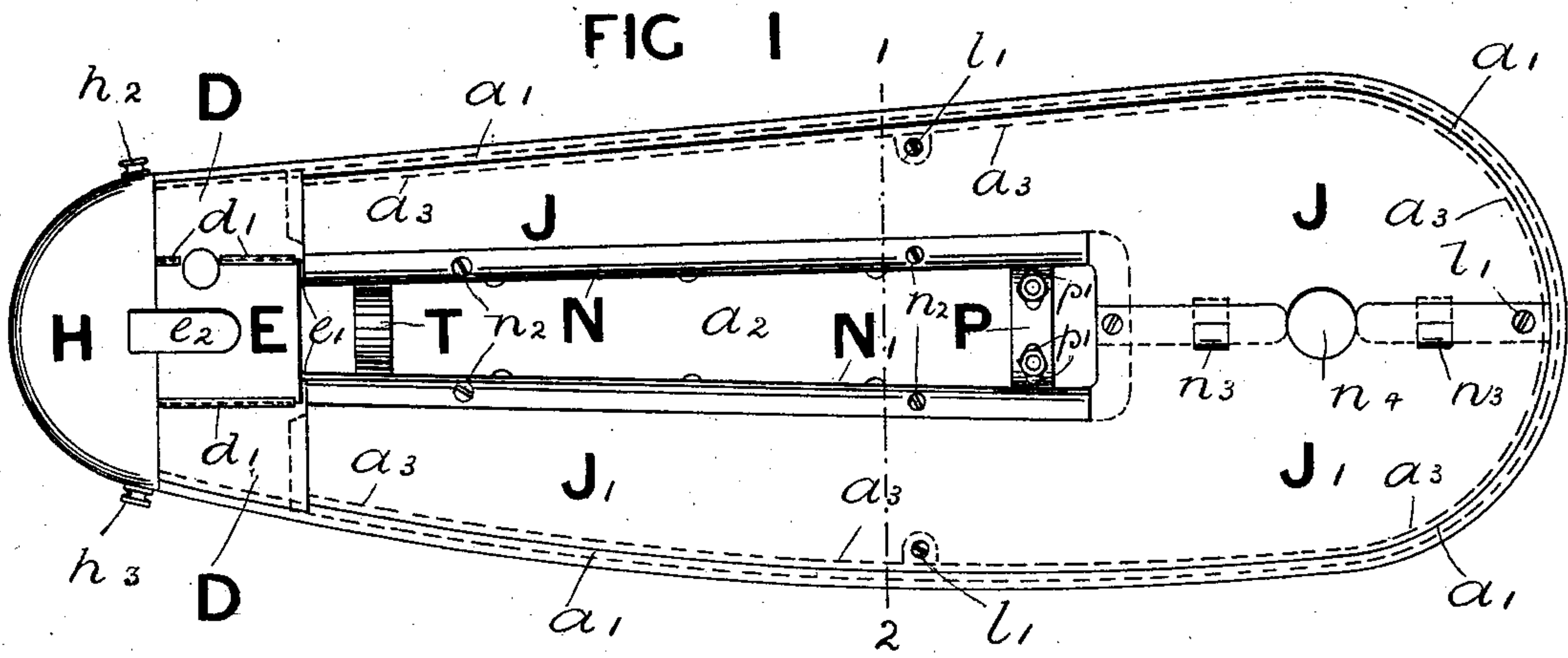
J. H. HUGHES & J. T. MUSGROVE.

GEAR CASE.

(Application filed Mar. 29, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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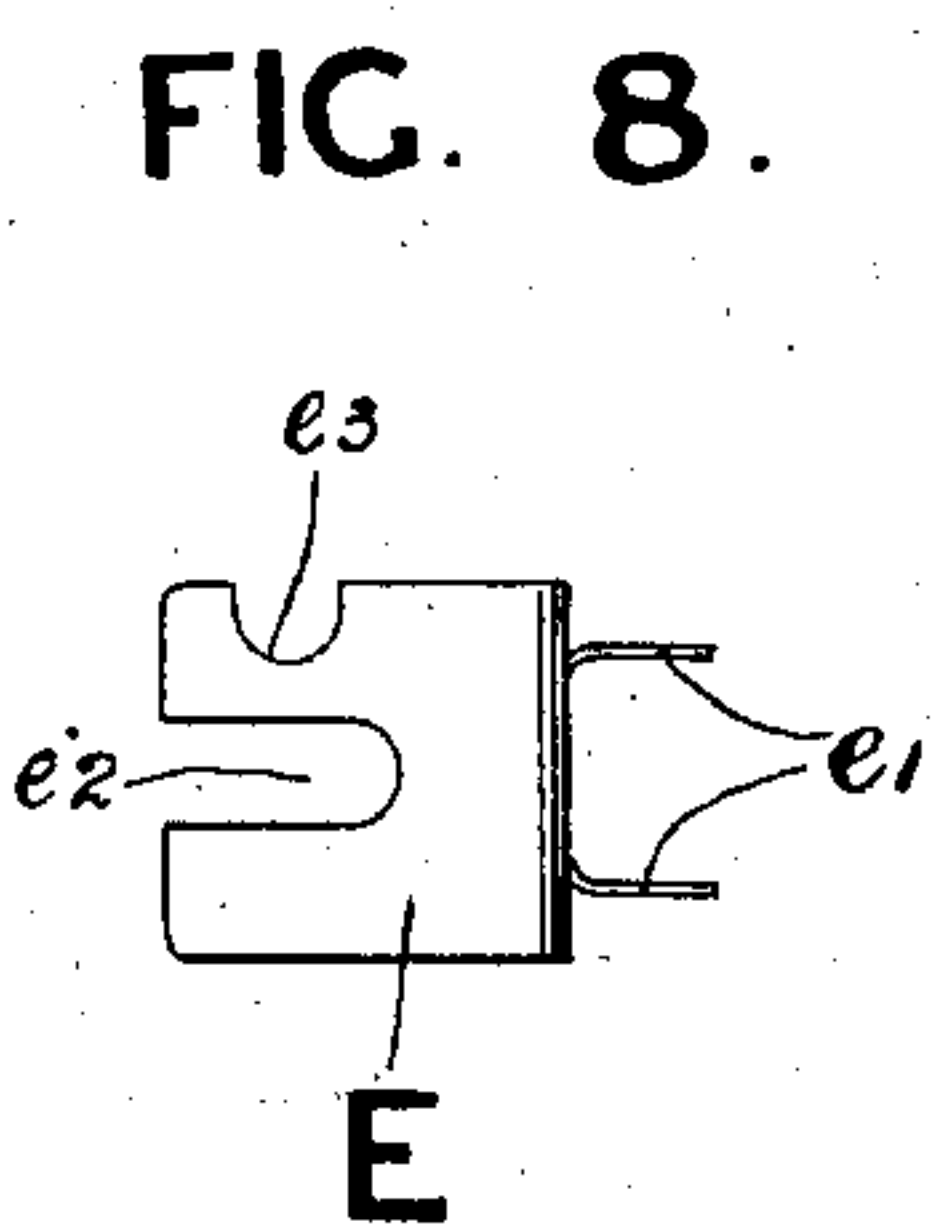
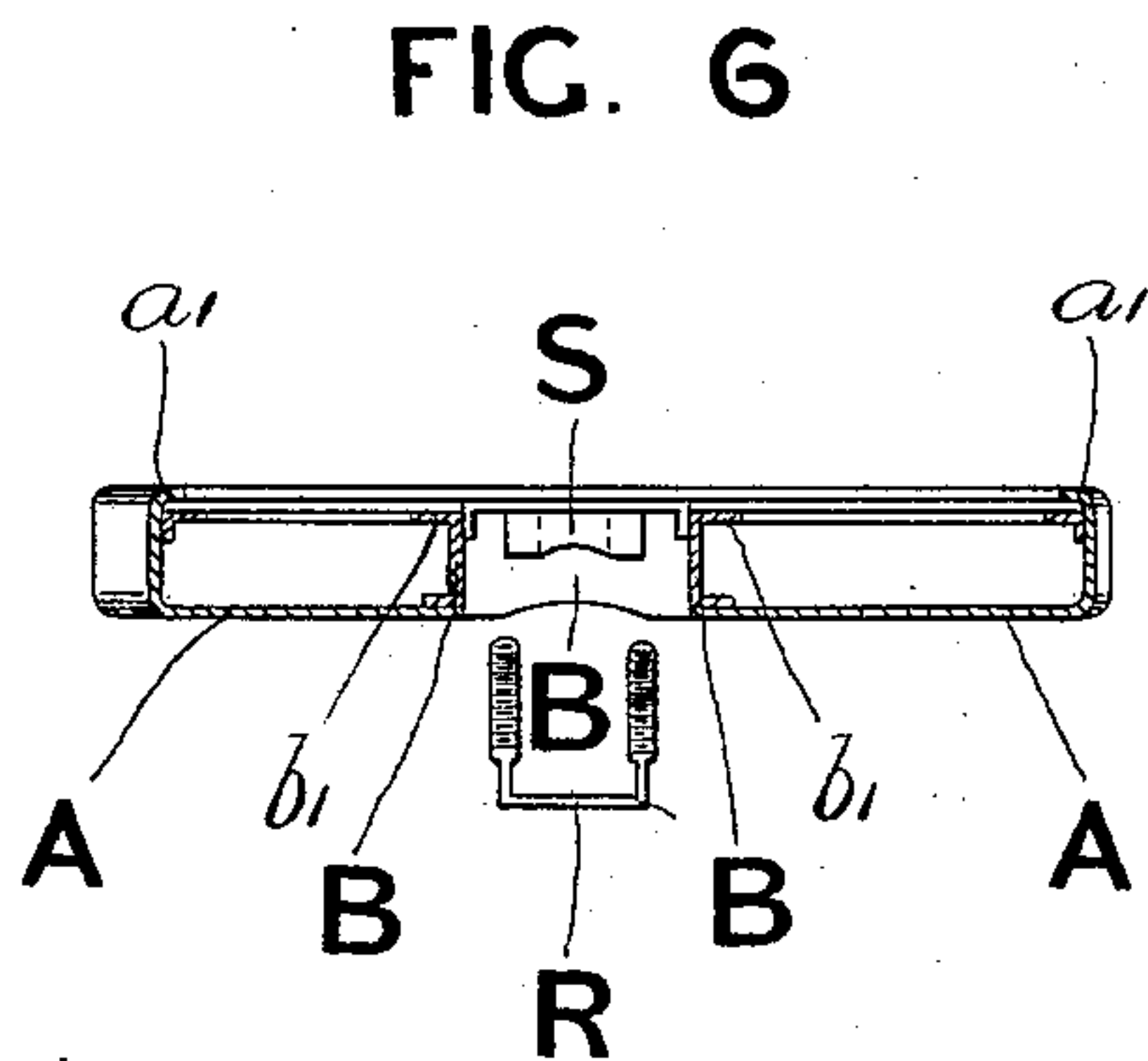
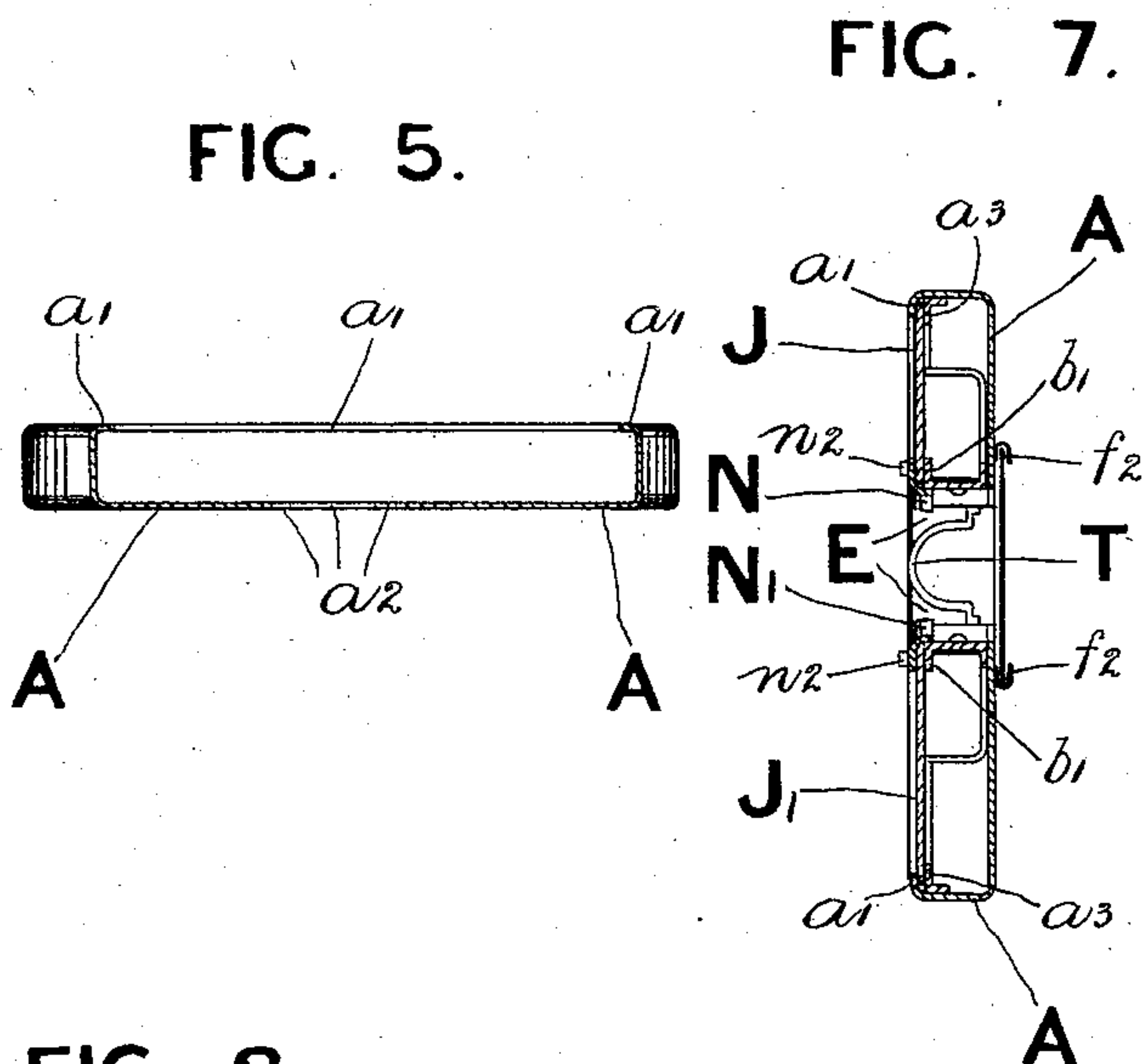
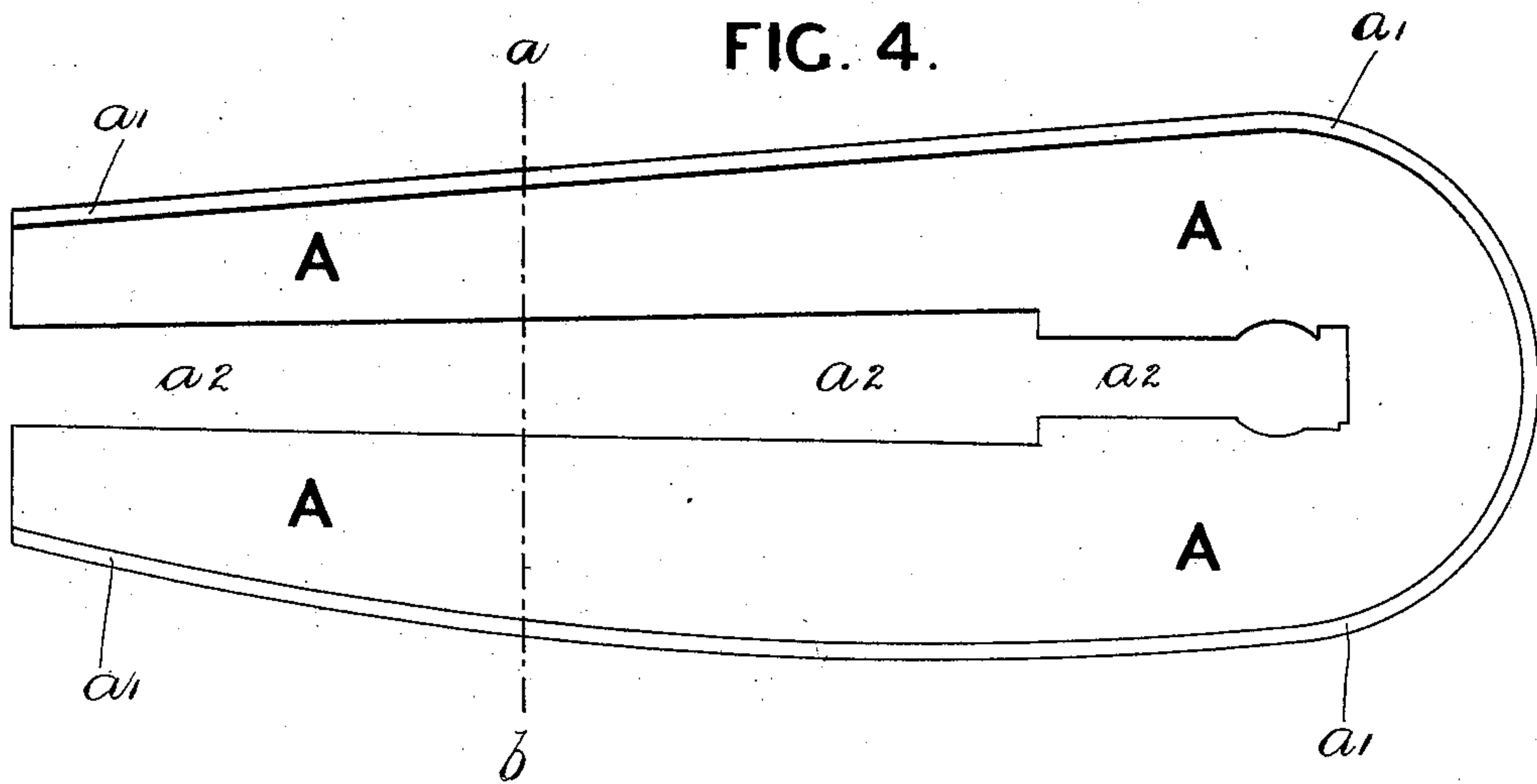
J. H. HUGHES & J. T. MUSGROVE.

GEAR CASE.

(Application filed Mar. 29, 1898.)

(No Model.)

3 Sheets—Sheet 2.



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J. H. HUGHES & J. T. MUSGROVE.

GEAR CASE.

(Application filed Mar. 29, 1893.)

(No Model.)

3 Sheets—Sheet 3.

FIG. 13

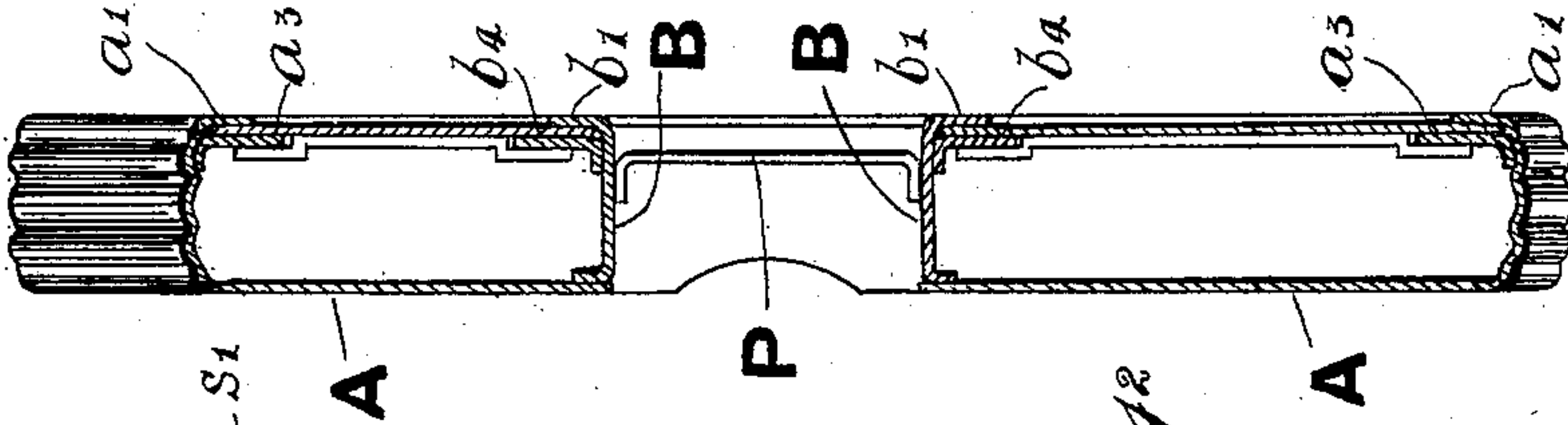


FIG. 11

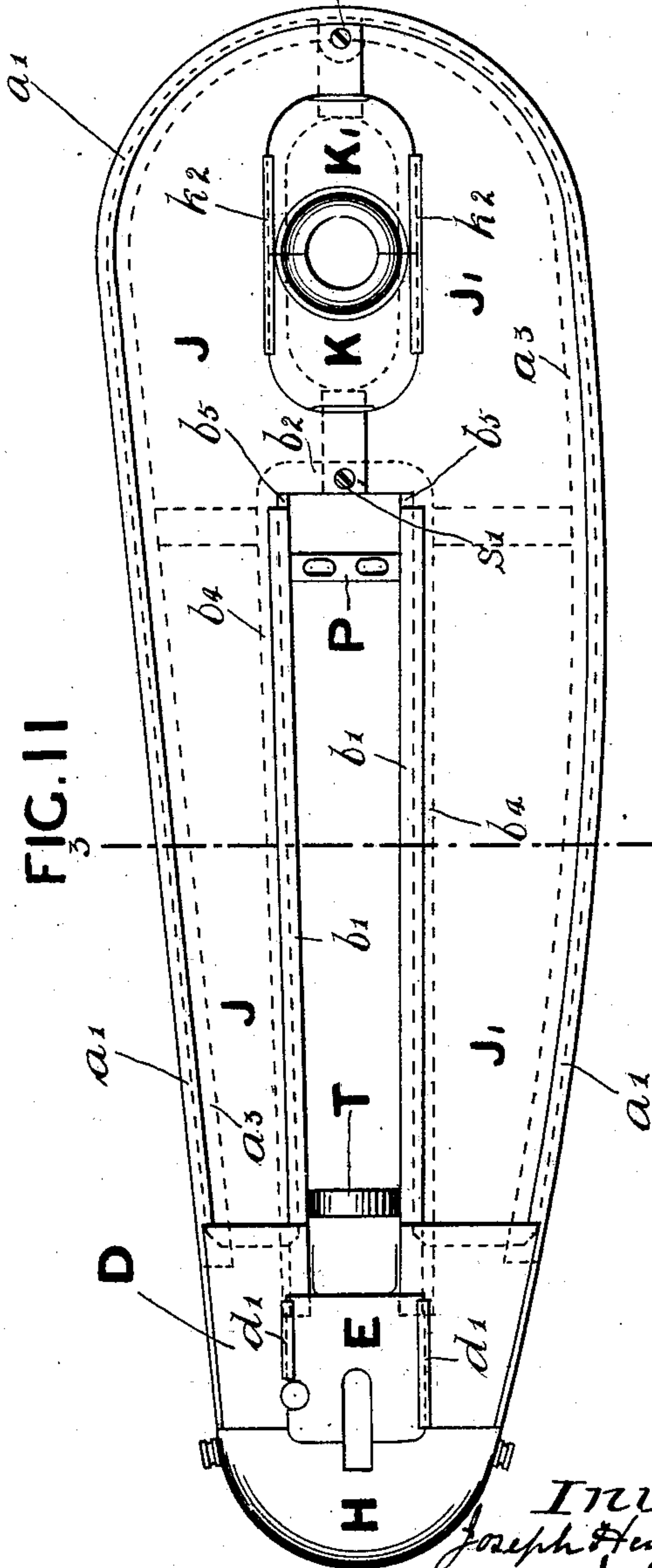
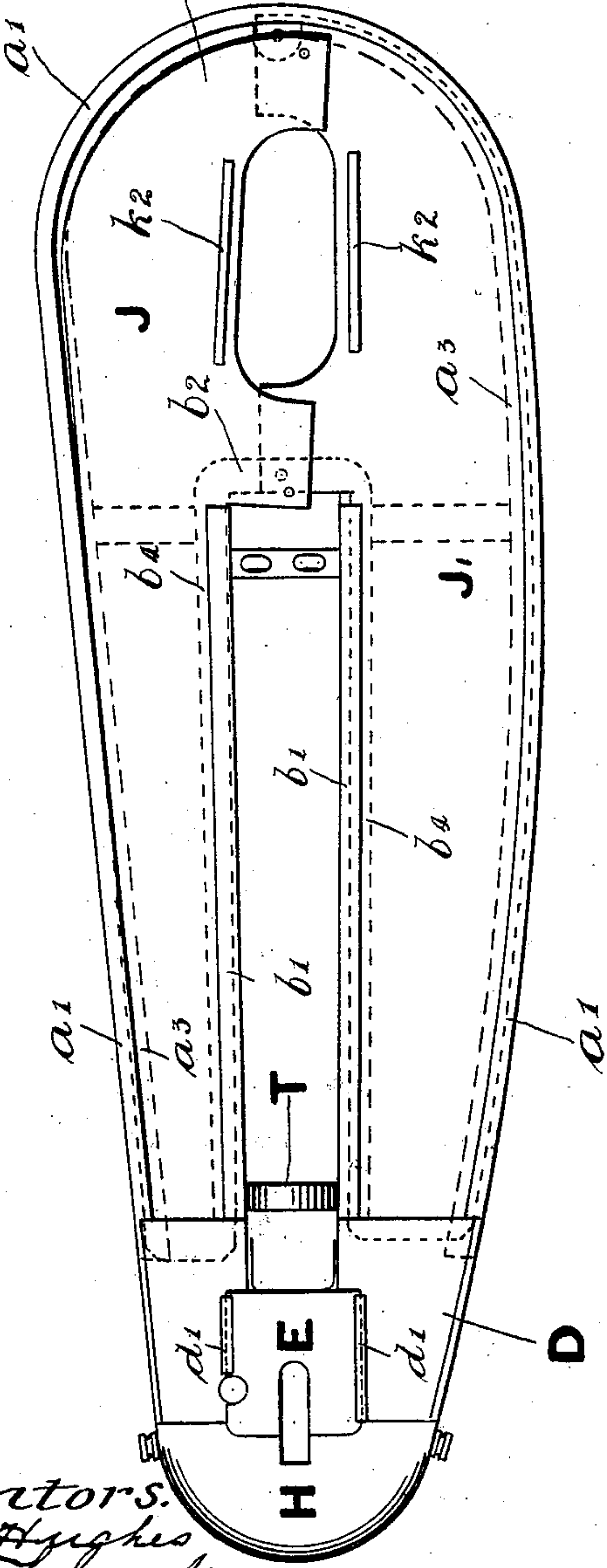


FIG. 12



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UNITED STATES PATENT OFFICE.

JOSEPH HENRY HUGHES AND JOHN THOMAS MUSGROVE, OF BIRMINGHAM,
ENGLAND.

GEAR-CASE.

SPECIFICATION forming part of Letters Patent No. 606,840, dated July 5, 1898.

Application filed March 29, 1898. Serial No. 675,564. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH HENRY HUGHES, works manager, of Aston Junction, Aston Juxta, and JOHN THOMAS MUSGROVE, mechanic, of 53 Colville road, Sparkbrook, Birmingham, in the county of Warwick, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Gear-Cases and in the Manufacture of the Same, of which the following is a full, clear, and exact description.

Our invention has for its object improvements in gear-cases and in the manufacture of the same, by which we are enabled to easily and readily obtain access to the driving-chain without detaching the main body of the gear-case and also to materially reduce the cost of manufacture.

In carrying our invention into practice we form the back or main body or frame of our gear-case out of a metal blank by suitable tools, the rear end or portion which fits around the hub sprocket-wheel being made detachable, or this portion of the frame of the case may be made from a separate metal blank. The center portion of this frame is cut away and a division or bridge piece or frame fixed thereto so as to separate the top and bottom portions of the driving-chain. Suitable provision is also made for the bracket-spindle and hub-spindle to revolve in. The front portion of our gear-case we form in two parts, either from celluloid, tin, or other metal or material, the outer edges of which fit into grooves formed on the edges of the main portion or frame, and the inner edges are held in position by strips of metal which are secured to the center bridge-piece and an adjustable slide. Fixed at the front end of this center bridge-piece is a strut or stay to which an adjustable clip is secured for fixing the gear-case to the frame of the cycle. The clip which holds the rear portion of the gear-case is also adjustable and may be provided with means for regulating the position of the gear-case.

In order that our invention may be clearly understood and easily carried into practical effect, we have appended hereunto three sheets of drawings, upon which we have illustrated examples of our improved gear-case.

Figure 1 is a front elevation of our gear-case complete. Fig. 2 is a part front elevation showing the end detached and the celluloid front removed. Fig. 3 is a back view of Fig. 1. Fig. 4 is a front elevation of the body portion, which is formed in one piece. Fig. 5 is a cross-sectional view taken on the line $a b$ of Fig. 4. Fig. 6 is a cross-sectional view taken on the line $x y$ of Fig. 2, with a portion of the clip R detached. Fig. 7 is a cross-sectional view of Fig. 1, taken on the line 1 2. Fig. 8 is a front elevation of the slide E. Fig. 9 is a plan view of Fig. 8. Fig. 10 is a plan view showing the clip R. Fig. 11 is a similar view to Fig. 1, showing a modified form of our gear-case. Fig. 12 is a similar view to Fig. 11, showing the front part J moved in position ready for being withdrawn. Fig. 13 is an enlarged cross-sectional view of Fig. 11 taken, on the line 3 4.

In carrying our invention into practice we form the back or main body or frame A of our gear-case out of a metal blank or sheet of metal by suitable tools, so as to raise the sides and one end. The edges a' of these sides and the one end are then turned over at right angles, so as to form an inwardly-turned flange. The slot a^2 is then cut in the center of the back or base of this frame, extending from the open end about three parts the way up. The slot then closes in or narrows and is then formed partially circular for the boss or spindle of the bottom bracket sprocket-wheel to pass through, as clearly shown at Fig. 4. A strip of metal a^3 is then secured under the flange a' , so as to form a recess or groove all round the interior of the sides. We then secure the division or parting strips B partly around the edges of the larger portion of the slot a^2 , so as to separate the top and bottom portions of the driving-chain, the edges b' of these parting-strips being flanged over at right angles, the end piece b^2 being also flanged over. Fitted into the narrow part of the slot a^2 is the inwardly-curved portion b^3 , which fits partly around the back forks of the cycle-frame. On the end of the case A where the parting-strips finish we secure the pieces D, provided with the grooves d' , into which the slide E fits. One end of this slide is bent over

at right angles and is provided with the side pieces e' , which fit against the parting-strips, thus entirely closing this end of the parting-strips. The other end of the slide E is formed 5 with the slots e^2 and e^3 . The slot e^2 is for the spindle of the wheel to pass through, and the slot e^3 , which is formed on the side of the slide, is provided for the back stay screw or nut to pass through. On the opposite side of the 10 case A we form the grooves f^2 , in which the slide F fits, this slide being provided so as to fit around a portion of the hub of the wheel for preventing dust and dirt from entering, the other portion being inclosed by the slide 15 F', which fits partly into the grooves f^2 and partly into the grooves h' , formed on the end piece II. This end piece, which fits onto the parts d^2 and is held in position by the thumb-screws h^2 and h^3 , entirely incloses the sprocket- 20 wheel on the rear wheel of the cycle, thus completely surrounding the driving-chain and sprocket-wheels. The front portion or face of our gear-case is formed in two parts J and J', either from celluloid, tin, or other 25 metal or material. In the example shown on the drawings we have formed the front of celluloid, the outer edges of which fit into the groove formed around the edge a' of the case A, and are held in position by the screws 30 l' . The inner edges of the parts J and J', which fit around the flanges b' of the parting-strips, are held in position by the L-shaped strips N N', which are secured to the parting-strips by the screws n^2 ; but the inner edges 35 of the parts J and J', which overlap each other, are held in position by the hook-shaped clips N³ n^3 . The hole n^4 is provided for the spindle of the bracket to pass through. The front parts J and J' may be formed in one 40 piece, the outer edges fitting under the grooves or recesses a' and the center portions being held by the strips N and N'.

Fixed between the parting-strips B at the front end of the case is the strut or stay P, 45 provided with the slots p' , through which the ends of the clip R pass. This clip is formed trough-shaped, the ends which pass through the strut or stay P being screw-threaded. Fitted into these ends of the clip between the 50 stay and the clip is the adjusting-piece S, formed with a hollow or other shape on its inner surface, as clearly shown at Fig. 10. This adjusting-piece is provided so as to enable the gear-case to be fixed to any veloci- 55 pede, as the chain-lines vary in different builds of machines, and, when necessary, by reducing the thickness of this block the gear-case can be brought exactly over the center of the sprocket-wheels.

60 The strut or stay T, which is fixed between the parting-strips at the opposite end, is provided so as to support that end of the gear-case.

In the modification as shown at Figs. 11, 65 12, and 13 we dispense with the loose L-shaped strips N and N', and underneath the

flanged edges b' of the parting-strips B we secure the flanges b^4 , thus forming a groove between the edges b' and the flanges b^4 , into 70 which the front portions or face J and J' of the gear-case fit. The ends of the flanged edges b' are cut away, so as to leave spaces b^5 between the end piece b^2 and these edges, so as to allow the front portions to be with- 75 drawn, and in order to withdraw these front portions the end j^2 is pushed forward and then drawn from under the edge a' into the position as shown at Fig. 12. When the front portions J and J' have been fitted into the 80 grooves, they are secured in position by the screws s' . The parts of the front portions which fit around the spindle of the back wheel of the cycle are cut away, and the 85 grooves k^2 are formed on or near the edge, into which the slides K and K' fit. These slides, which are formed at their inner ends so as 90 to fit around the back-wheel spindle, are dished inward for strengthening purposes, and when these slides are fitted into the grooves k^2 , as shown at Fig. 11, they form an additional security for holding the front por- 95 tions firmly in position.

In some cases we may corrugate the sides of the body or frame A, as clearly shown at Fig. 13, which materially adds to the strength 95 of this part of the gear-case.

We claim—

1. In combination, the body portion formed of a single piece of sheet metal having a later- 100 ally-turned edge provided with an inwardly-extending flange, said body portion having a slotted center, a strip secured to the body portion parallel with the inwardly-turned edges and forming a groove or channel, parting- 105 strips secured at the edges of said slotted center, and a divided front portion having its outer edges connected with the parting-strips, substantially as described.

2. In combination, the body portion formed of a single piece of sheet metal having a later- 110 ally-turned edge provided with an inwardly-extending flange, said body portion being slotted for a portion of its length, a strip secured to said body portion parallel with the inwardly-turned flange forming a groove or 115 channel, parting-strips secured to the edges of the slotted portion, and a two-part front portion having its outer edges seated in said groove or channel and its inner edges con- 120 nected with the parting-strips, the portions of said two-part front portion forward of the slotted portion being overlapped and secured, substantially as described.

3. In combination, the body portion having a slotted central portion, and having a later- 125 ally-turned outer edge provided with a groove or channel, parting-strips secured at the edges of said slotted portion and having grooves or channels opposite the groove or channel in the body portion, said grooves or channels in 130 the parting-strips terminating in advance of the end of the slotted portion to provide

spaces b^5 and the front having its edges seated in the said grooves or channels, substantially as described.

4. In combination, the body portion having
5 the partially-slotted center and having slots or channels at the outer and inner edges, the front portion formed in two parts and having its edges seated in said grooves or channels and having overlapping portions with a slot
10 or recess therein for the bicycle crank-shaft, guides carried by said front portions on each

side of said recess, and slides K and K' inserted in said guides, substantially as described.

In witness whereof we have hereunto set 15
our hands in presence of two witnesses.

JOSEPH HENRY HUGHES.
JOHN THOMAS MUSGROVE.

Witnesses:

GEORGE LESTER,
E. S. FRIEND.