

No. 876,998.

PATENTED JAN. 21, 1908.

E. D. PRIEST.

MEANS FOR SUPPORTING BRUSH HOLDERS.

APPLICATION FILED DEC. 18, 1905.

2 SHEETS—SHEET 1.

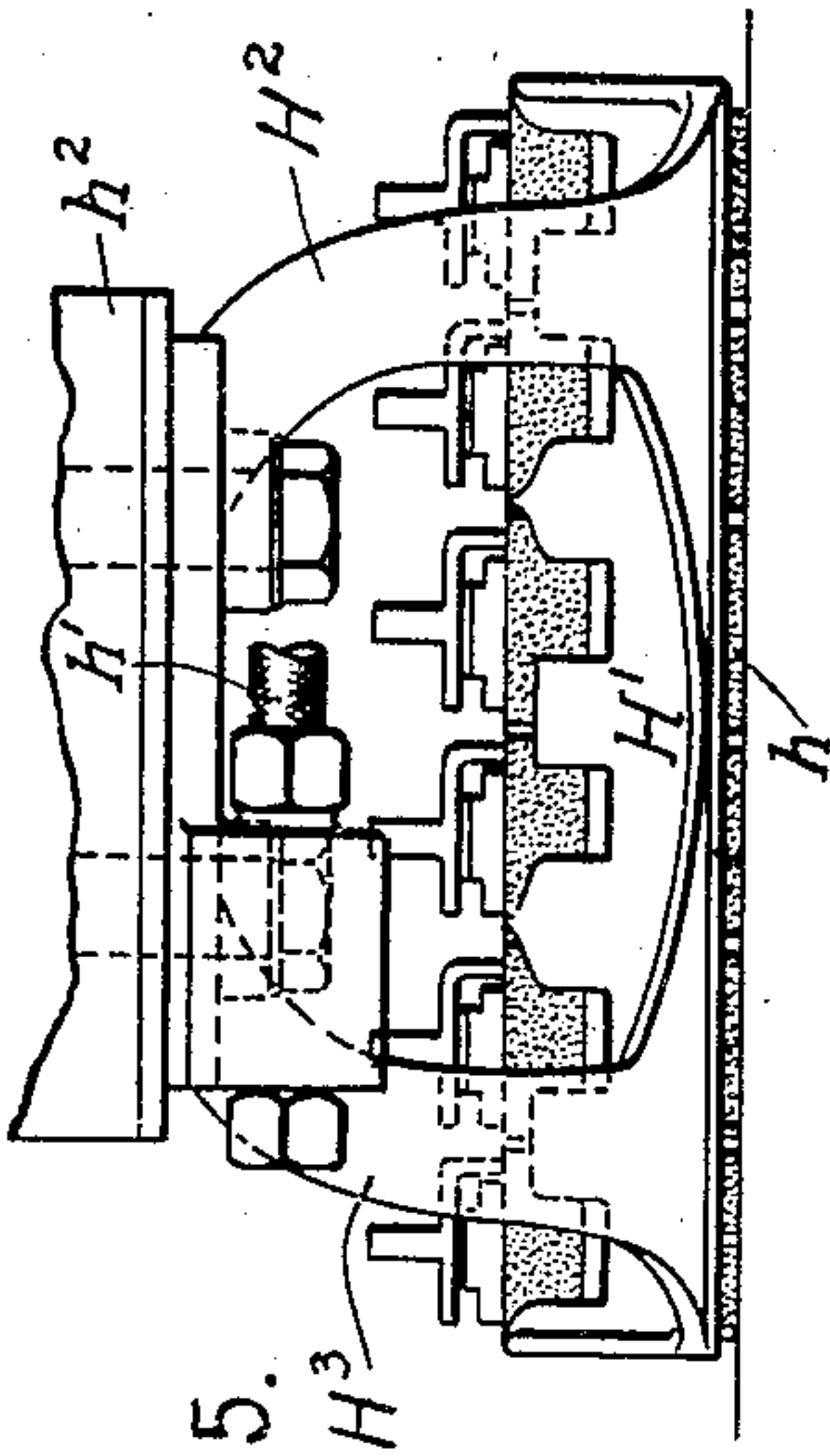


FIG. 5.

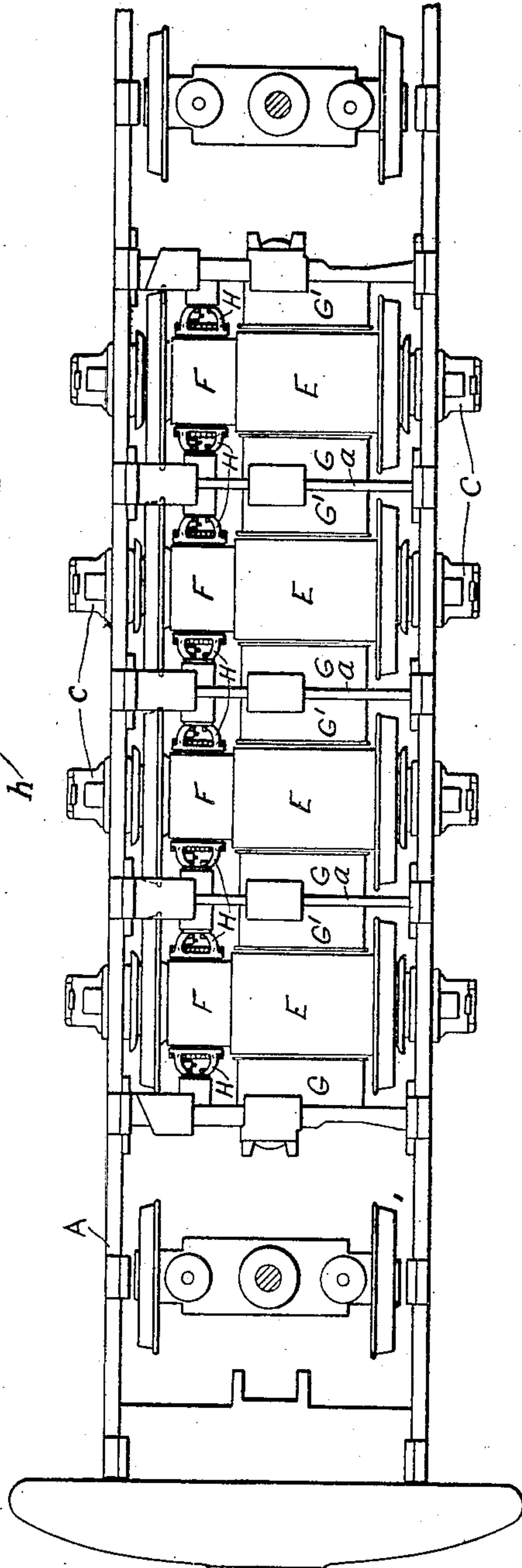


FIG. 1.

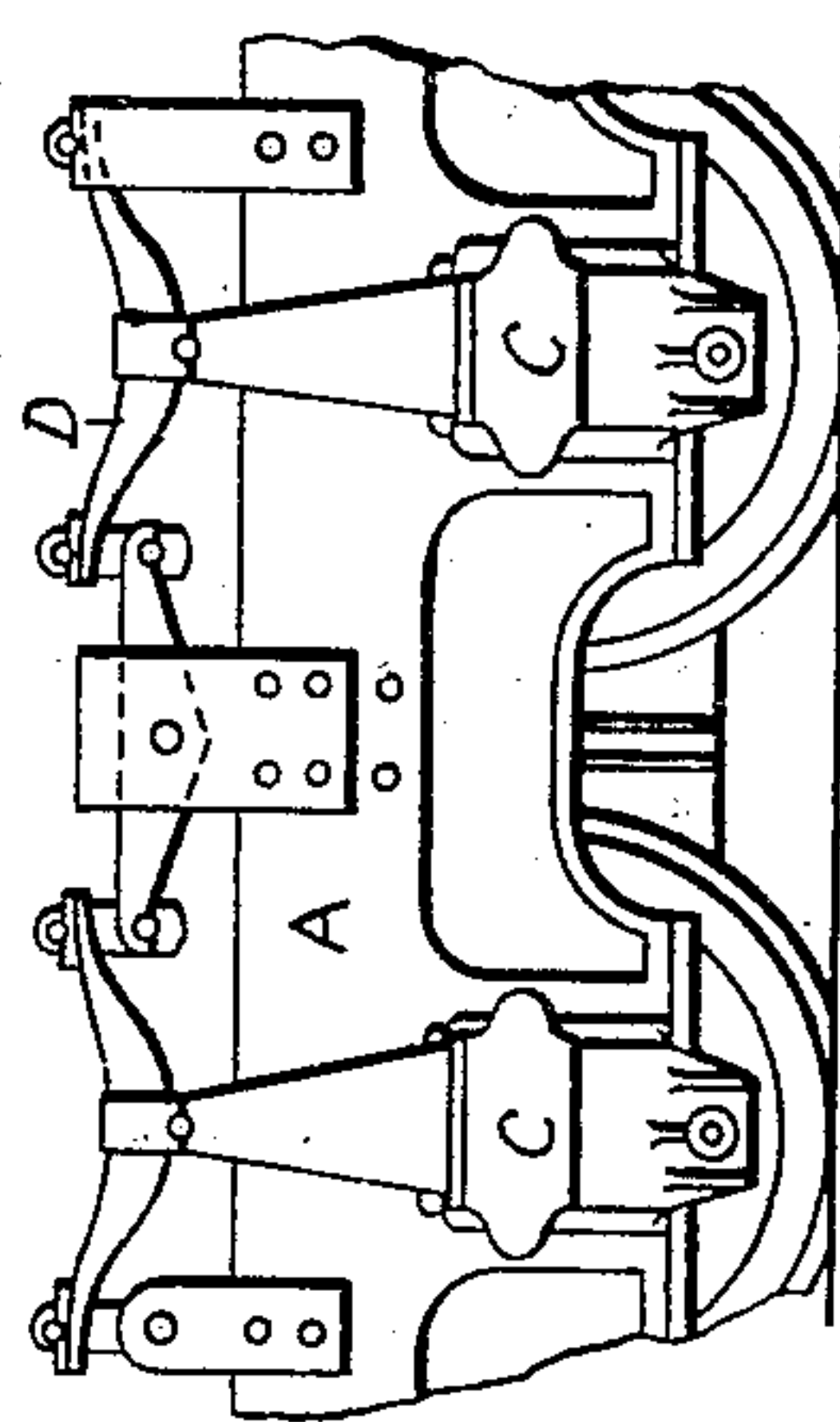


FIG. 2.

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Allen Oxford

Inventor,  
Edward D. Priest.  
by *Alfred D. Davis*  
Att'y.

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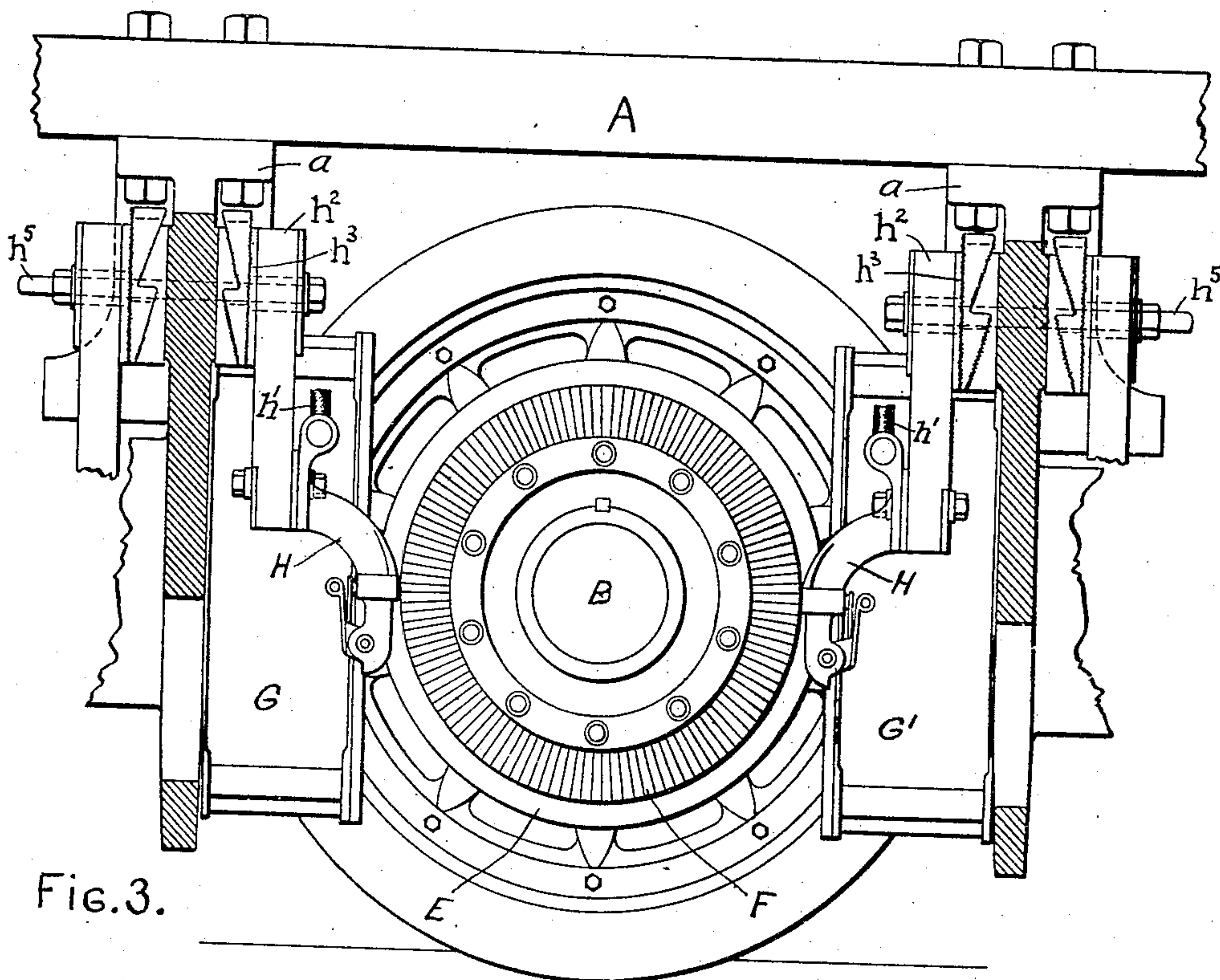


Fig. 3.

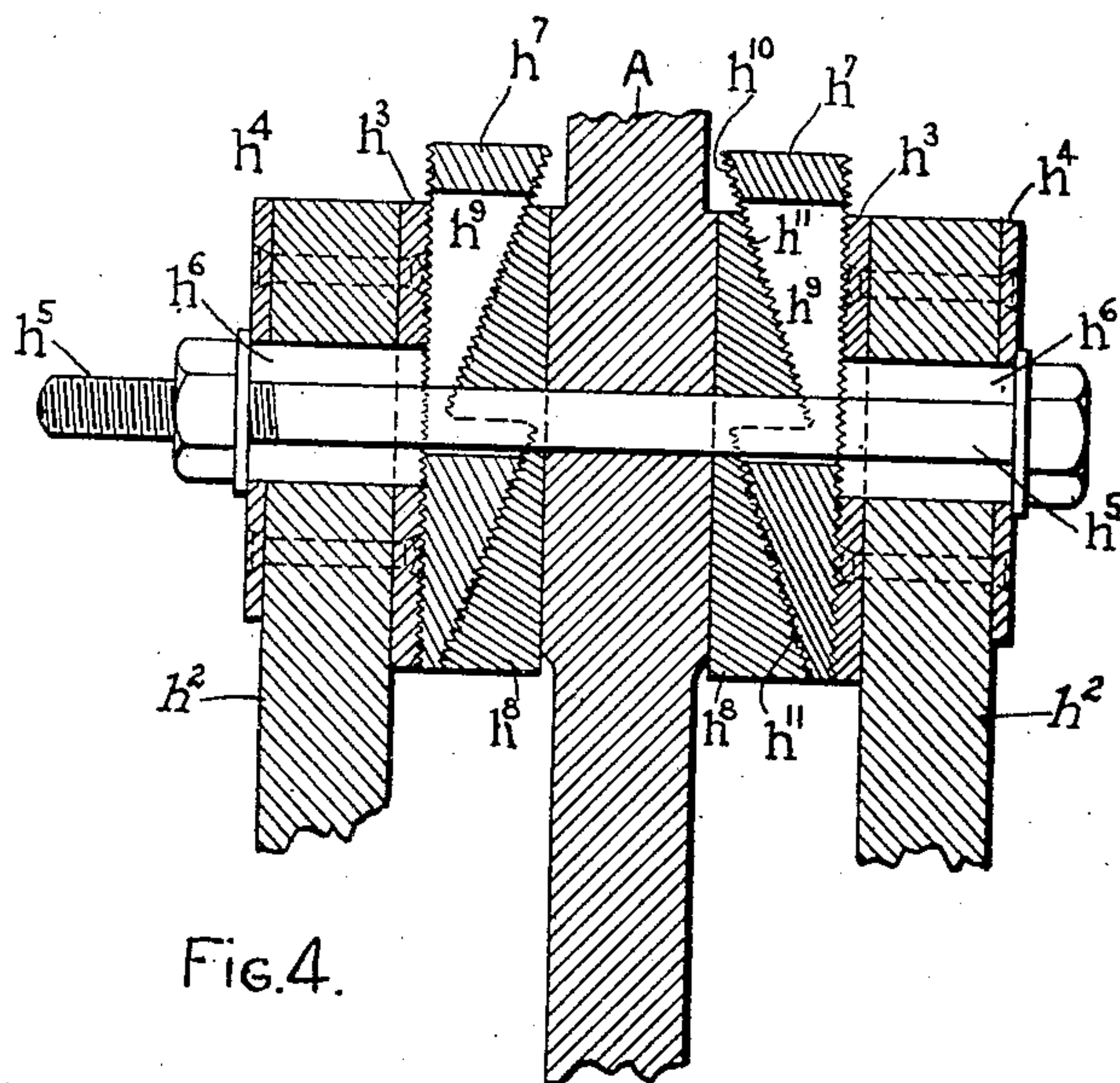


Fig. 4.

Witnesses:

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# UNITED STATES PATENT OFFICE.

EDWARD D. PRIEST, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## MEANS FOR SUPPORTING BRUSH-HOLDERS.

No. 876,998.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed December 18, 1905. Serial No. 292,133.

*To all whom it may concern:*

Be it known that I, EDWARD D. PRIEST, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented certain new and useful Improvements in Means for Supporting Brush-Holders, of which the following is a specification.

The present invention relates to supports for brush-holders and particularly to means for supporting brush-holders associated with the propelling motors of electric locomotives or the like; and it comprises a simple and novel construction and arrangement of parts to be hereinafter described and particularly pointed out in the claims.

In the accompanying drawings I have illustrated a preferred form of the present invention, Figure 1 being a plan view of a locomotive with the parts above the frame removed; Fig. 2 a fragmentary side elevation; Fig. 3 a cross-section through one of the driving axles and showing in side elevation the brush-holders; Fig. 4 a cross-section showing in detail the manner of supporting the brush-holders; and Fig. 5 a top plan view of one of the brush-holders.

Reference being had to the drawings, A represents the locomotive frame yieldingly supported upon a plurality of driving axles B through journal boxes C and spring equalizing mechanism D; in the usual manner. Upon each of the driving axles is mounted a motor-armature E, together with its associated current collector or commutator F. Pole pieces G and G<sup>1</sup> are supported from cross members a of the frame on opposite sides of the several armatures. All these parts may take any usual or preferred forms since they in themselves form no part of the present invention, being disclosed and claimed in Patent No. 808,717, granted on Jan. 2, 1906, on an application filed by Asa F. Batchelder, and it being of course understood that by the term locomotive is meant, not only locomotives, as this term is ordinarily used, but also trucks or vehicles of any kind.

The present invention contemplates a simple and compact construction whereby the brushes of the several motors may be effectively supported in operative relation to the several current collectors or commutators and in such a manner that the brush-holders may be conveniently and quickly adjusted with relation to the commutator

and be easy of access. To this end I support the brush-holders directly from the locomotive frame, preferably upon the cross members which carry the pole-pieces, so arranging the supporting connection that the brush-holders are adjustable radially of the commutator and also tangentially thereto. The brush-holders are represented by H, and they, together with the brushes h may be of any usual or preferred form. Current is supplied through leads h<sup>1</sup>. Each brush-holder proper is preferably secured to the lower end of a slab or block of wood or other insulating material h<sup>2</sup>. The upper end of each member h<sup>2</sup>, which is preferably protected by metal plates h<sup>3</sup> and h<sup>4</sup>, is adapted to be secured to one of the transverse members a. Since one of the brush-holders of each of two consecutive motors is adapted to be supported upon the transverse member intermediate the two motors, a single bolt h<sup>5</sup>, passing through openings h<sup>6</sup> in the upper ends of the members h<sup>2</sup>, and through the frame member a, may be made to secure both brush-holders in position. In order that the brushes may be readily adjusted in assembling the parts and also for the purpose of taking up wear, I have provided wedges h<sup>7</sup> which, with complementary wedges h<sup>8</sup>, are positioned between the members h<sup>2</sup> and the frame. By moving the members h<sup>7</sup> and h<sup>8</sup> relative to each other they serve to carry the brushes toward and away from the commutator, as the case may be. The wedges h<sup>8</sup> may be integral with or secured to the frame member a, but they are conveniently formed as separate elements which are held in place by means of the bolts h<sup>5</sup>. The wedges h<sup>7</sup> are preferably provided with elongated slots h<sup>9</sup> through which the bolts h<sup>5</sup> pass, so that the wedges are movable within the limits of the slots. The tangential adjustment of the brushes may be secured by forming the openings h<sup>6</sup> elongated in the vertical direction, so that the brush-holders can be moved up and down without disturbing the lateral adjustment due to the wedges. The engaging faces of the members h<sup>3</sup>, h<sup>7</sup> and h<sup>8</sup> may be made corrugated, as shown, for the purpose of locking the parts more securely in their adjusted positions than could be done if these faces were smooth. Moreover, the members h<sup>8</sup> and the wedge members are preferably formed with double parallel inclines, h<sup>11</sup>, h<sup>11</sup> and h<sup>10</sup>, h<sup>10</sup>, respectively, where-



by a long bearing surface is obtained without making these parts inconveniently thick. This latter feature is of considerable importance since economy of space is a material consideration in apparatus intended for use within the restricted limits available in locomotives.

In order that the brushes may be readily accessible both from above and below, the brush-holders are preferably formed as illustrated in Fig. 5; that is, the member  $H^1$ , within which the brushes are arranged, is carried at the lower end of two curved arms  $H^2$  and  $H^3$  which are connected to the member  $H^1$  near the ends thereof, leaving a space between them through which the hand may be inserted. The arms  $H^2$  and  $H^3$  are also bent or curved away from the support  $h^2$  so that substantially the entire brush mechanism is visible from a point directly above the brushes. It is possible to make the amount of this outward curvature much greater by forming the adjusting wedges with double inclines as illustrated than with wedges dividing the same bearing surfaces and having but single inclines.

It will be noted that although the particular form of tangential adjustment illustrated may be used very advantageously with the means shown for securing the radial adjustment, yet in some of its aspects the present invention is not limited to a construction in which both these features are combined, as shown, since either of these adjustments may be obtained in different ways without interfering with the successful operation of the devices which provide the other adjustment.

What I claim as new and desire to secure by Letters Patent of the United States, is,

1. In an electric locomotive, a driving axle, a frame yieldingly mounted upon said driving axle, a motor having portions including the current collector supported by said driving axle for movement therewith, brushes, and means mounted upon said frame for supporting said brushes in operative relation to said current collector.

2. In an electric locomotive, a driving axle, a frame yieldingly mounted upon said driving axle, a motor having its armature and commutator mounted upon and carried by said driving axle, brushes, and supports for said brushes located on said frame.

3. In an electric locomotive, a driving axle, a locomotive frame mounted upon said axle, a motor having an armature and a commutator mounted upon said axle independently of the said frame, brush-holders provided with brushes adapted to engage said commutator, and adjustable supports on said frame for said brush-holders arranged to permit the brushes to be moved radially of and tangentially to the commutator.

4. In an electric locomotive, a pair of

driving axles, a locomotive frame mounted upon said driving axles, motors having their armatures and commutators mounted upon said driving axles, a transverse frame member located between said axles, brush-holders for said motors including a pair of brush-holders arranged upon opposite sides of said transverse frame member, and a fastening member for securing said pair of brush-holders and said transverse frame member together.

5. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator mounted upon said axle, brushes cooperating with said commutator, brush-holders supported on said frame, a wedge between each brush-holder and said frame for adjusting the brush-holder laterally, and means for adjusting each brush-holder longitudinally.

6. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator mounted upon said axle, brushes cooperating with said commutator, brush-holders supported upon said frame, a wedge between each brush-holder and said frame for moving the brush-holder toward and away from the frame, and means for adjusting the brush-holders at right angles to the direction of adjustment permitted by said wedge.

7. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator mounted upon said axle, brushes cooperating with said commutator, brush-holders for said brushes supported upon said frame, and two relatively movable members between each of said brush-holders and said frame, each of said members being provided with a plurality of parallel inclined faces adapted to engage with the corresponding faces on the other member.

8. In an electric locomotive, a plurality of driving axles, a locomotive frame supported on said axles, motor armatures and current collectors mounted on each of said axles, transverse frame members intermediate said axles, pole pieces supported by said transverse frame members, brush-holders supported on said transverse frame members in operative relation to the current-collectors, and two relatively movable members between each of said brush-holders and the supporting member, each of said relatively movable members having a plurality of parallel inclined wedge faces adapted to engage with the corresponding wedge faces on the other member.

9. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator supported upon said axle, brushes cooperating with said commutator, brush-holders each having an elongated slot supported



upon said frame, a wedge provided with an elongated slot between each brush-holder and said frame, and bolts passing through said slots in said brush-holders and wedges and serving to secure the same to the frame.

10. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator supported upon said axle, brushes coöperating with said commutator, brush-holders each having an elongated slot and corrugated face, wedges each having an elongated slot and corrugated faces adapted to coöperate with the corrugated faces on said brush-holder and corrugated faces on said frame, and bolts passing through said slots in said brush-holders and wedges and serving to hold the same in contact with the support.

11. In an electric locomotive, a driving axle, a locomotive frame on said axle, a motor having its armature and current collector mounted upon said axle, a brush-holder, a transverse frame member adapted to support said brush-holder, a wedge between said frame and said brush-holder for adjusting the brush-holder radially of the collector, and means permitting the brush-holder to be adjusted tangentially of the said collector.

12. In an electric locomotive, a driving axle, a locomotive frame on said axle, a motor having an armature and a current collector mounted upon said axle, a brush-holder having an elongated slot, a bolt adapted to pass through the said slot in the brush-holder and into a portion of the locomotive frame, and a wedge arranged between said brush-holder and said frame and having an elongated slot through which the said bolt passes.

13. In an electric locomotive, a plurality of driving axles, a locomotive frame supported upon said axles, motors having their armatures and current collectors mounted on said axles, transverse frame members between consecutive axles, brush-holders on opposite sides of each of said frame members,

wedges between each brush-holder and the corresponding frame member and provided with an elongated slot, and a bolt passing through each frame member and through the slots in the wedges and openings in the brush-holders.

14. In an electric locomotive, a driving axle, a frame supported upon said axle, a motor having its armature and commutator mounted upon said axle, brushes coöperating with said commutator, and means for supporting said brushes for adjustment in a plane tangential to the commutator.

15. In an electric locomotive, a driving axle, a motor having its armature and commutator mounted upon said axle, a field magnet frame yieldingly supported upon said axle for movements transverse to the driving axle, and brushes supported on said field magnet frame.

16. In an electric locomotive, a driving axle, a motor armature and commutator mounted on said axle, a brush-holder support, and a brush-holder comprising two arms connected at one end to said support and bent away from said support and from each other, a brush-receiving member connected to the other ends of said arms at points near the ends of said member, and brushes carried by said member in operative relation to the commutator.

17. In an electric locomotive, a driving axle, a motor-armature and a commutator mounted on said axle, brushes engaging said commutator at points on opposite sides of said commutator and located in approximately a horizontal plane, and supports for said brush-holders permitting access to the brushes from points above and below said plane.

In witness whereof, I have hereunto set my hand this 15th day of December, 1905.

EDWARD D. PRIEST.

Witnesses:

BENJAMIN B. HULL,  
HELEN ORFORD.