

(No Model.)

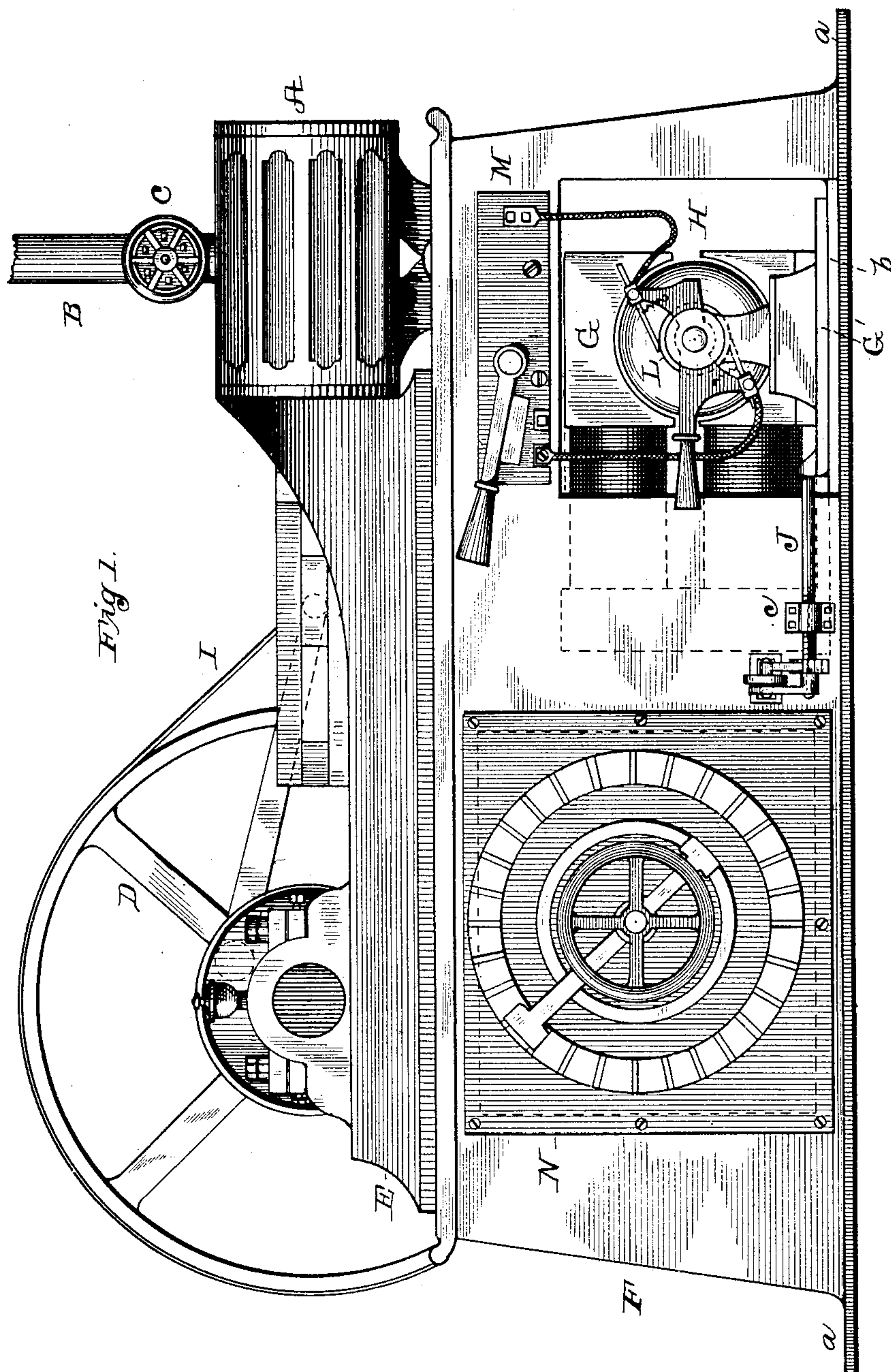
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J. H. VAIL.

COMBINED ENGINE AND DYNAMO ELECTRIC MACHINE.

No. 331,924.

Patented Dec. 8, 1885.



ATTEST:
Edw. Rowland
W. C. Fiddell

INVENTOR:
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By O. J. S. S. S.
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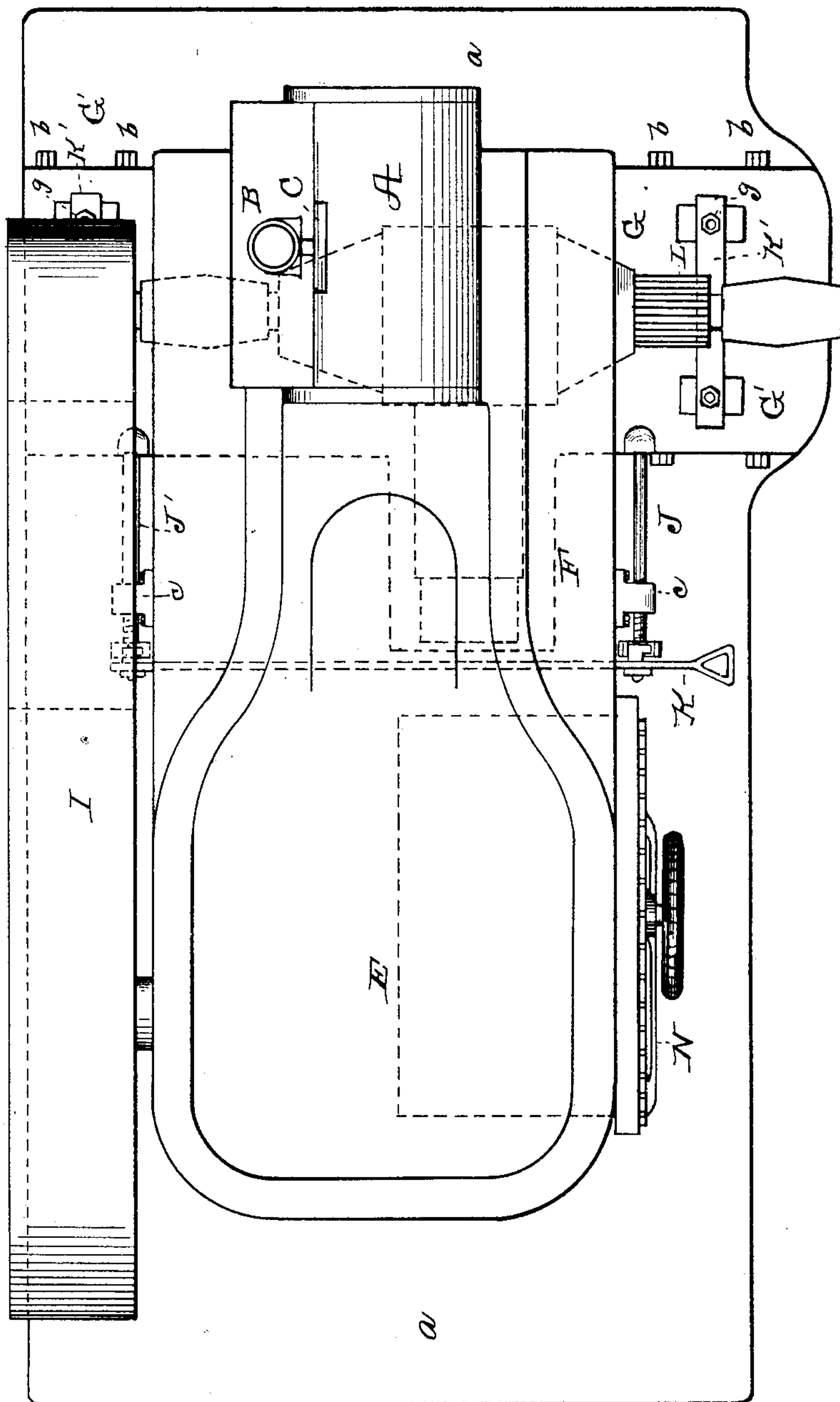
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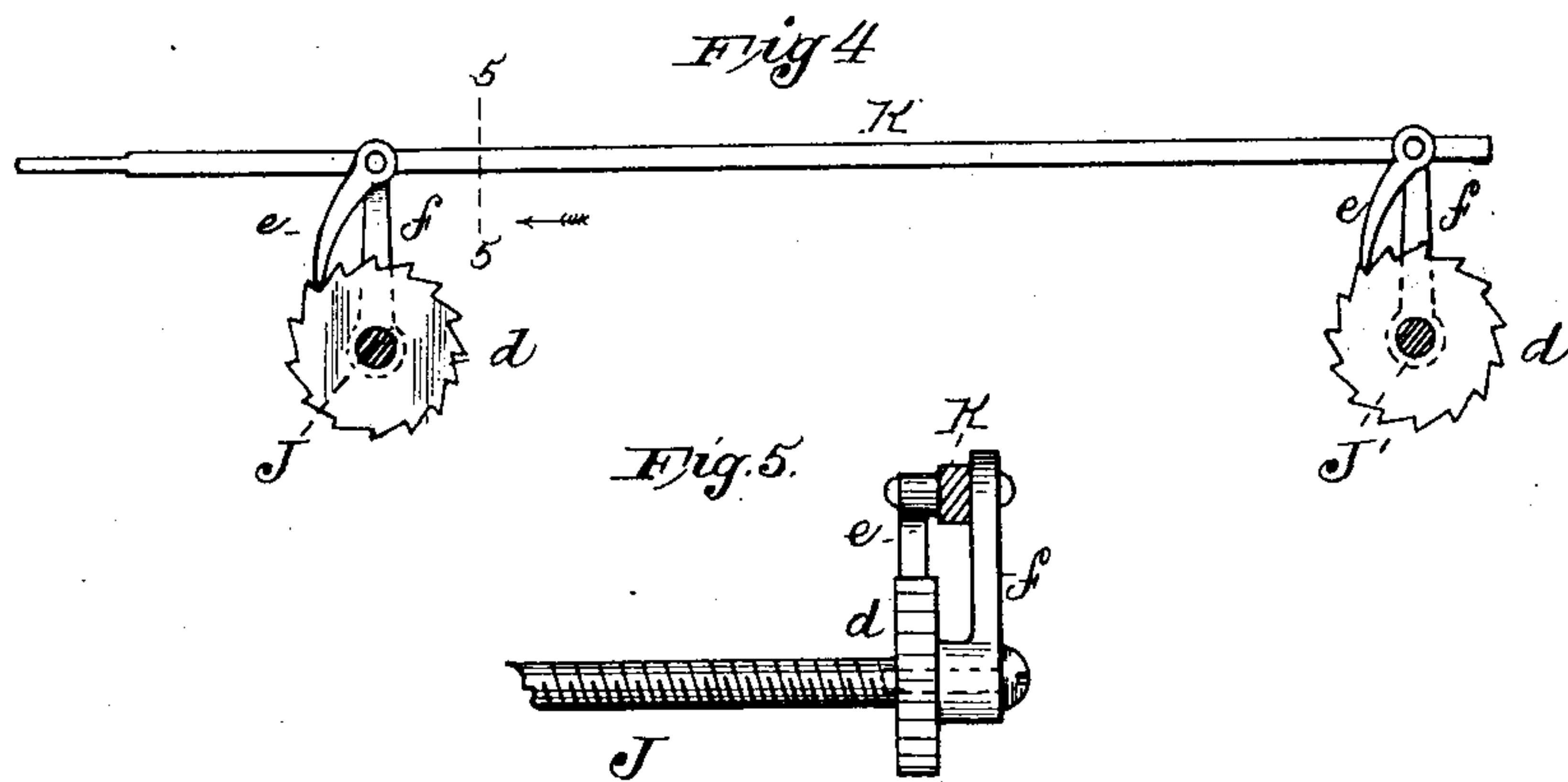
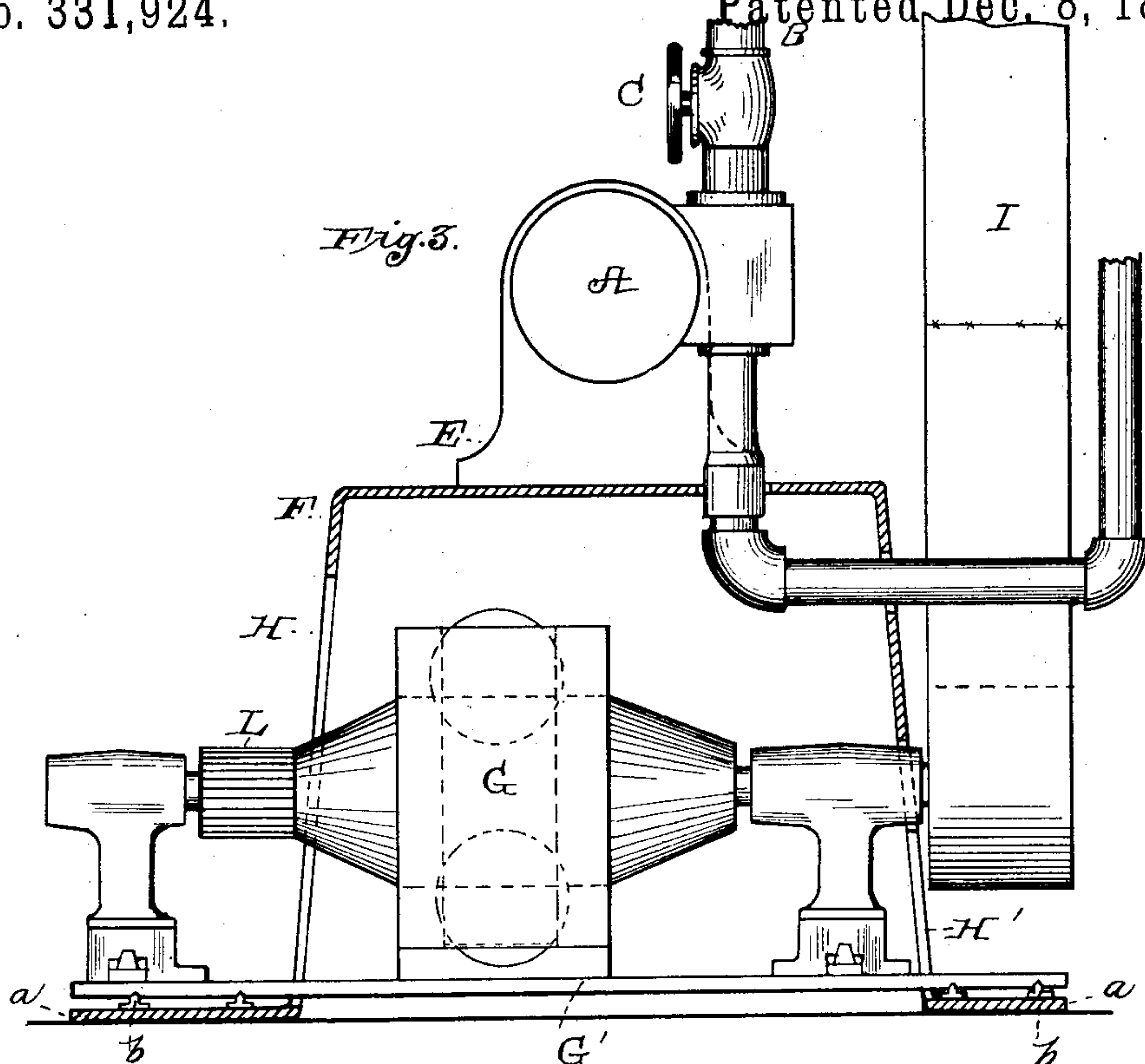
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UNITED STATES PATENT OFFICE.

JONATHAN H. VAIL, OF NEW YORK, N. Y.

COMBINED ENGINE AND DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 331,924, dated December 8, 1885.

Application filed July 11, 1885. Serial No. 171,378. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN H. VAIL, of New York city, in the county and State of New York, have invented a certain new and useful
5 Improvement in Driving Dynamo-Electric Machines, of which the following is a specification.

The object I have in view is principally to economize space in the arrangement and connection of a dynamo-electric machine and the engine driving it, at the same time retaining the advantages of high speed at the dynamo, giving the maximum current with the minimum weight of metal, and obtaining that high
15 speed by the use of an engine of moderately high speed only.

The invention consists in the broad features of combination, construction, and arrangement by which I am enabled to do this, and also in more specific features for making the apparatus complete and efficient, and for giving ready access to all parts.

In the drawings, Figure 1 is a side view of apparatus embodying my invention; Fig. 2, a top view with parts of engine omitted; Fig. 3, a vertical cross-section through engine, with dynamo in end elevation; Fig. 4, an elevation of belt-tightening device, with screws in section; and Fig. 5, a sectional view of this device
25 on line 5 5 in Fig. 4.

In carrying out my invention I use a horizontal or vertical automatic cut-off steam-engine of moderately high speed. Of this engine, which is shown as a horizontal engine,
35 A is the cylinder; B, the steam-pipe, with throttle-valve C; and D is the driving-wheel. The engine is secured upon a frame, E, as usual, and this frame is mounted upon a high hollow base, F. This high hollow base is preferably of cast metal, having a wide flange,
40 a, resting upon any suitable substructure. Within this base is placed the high-speed dynamo-electric machine G, having horizontally-arranged field-magnets, as shown, and
45 mounted upon a bed-plate, G', supporting at its ends the pillow-blocks for the armature-shaft journals, and having a lateral wing carrying the yoke of the field-magnet, this yoke and the polar extension next to base being
50 separated from the base by blocks of zinc or other non-magnetic metal. The flange a of the hollow base is made continuous, extend-

ing entirely around the base to give it solidity; but the sides of the base at the end beneath the engine-cylinder have openings H and H',
55 extending down to the flange a, but not through it, through which openings project on opposite sides of the base the ends of the dynamo bed-plate and the armature-shaft, the dynamo-pulley being placed outside the armature-shaft,
60 bearing on the non-commutator end of the shaft, and coming in line with the driving-wheel D of the engine, with which it is connected by a wide belt, I, the disadvantages arising from the shortness of the belt being
65 overcome by giving it the necessary additional width. The ends of the dynamo bed-plate project through the openings H H', and rest on runners b, secured to the flange a, the dynamo and engine being thus secured solidly together.
70 Screws J J' are employed to force the dynamo back on its runners to tighten the belt. These turn through nuts c on the base F, and bear against lugs on the dynamo bed-plate; or the reverse construction might be employed, the
75 nuts being on dynamo bed-plate, and the lugs on the hollow base.

In order to adjust the two or more screws from the side of engine opposite the belt, so that the belt may be tightened even while the
80 engine is running, I provided the screws with ratchet-wheels d, with which engage pawls e on a sliding cross-bar, k. This cross-bar is supported from the screws by arms f, and by moving it back and forth the screws will be
85 turned. This can be accomplished by any other suitable mechanism, as by a cross-shaft and bevel-gears, the shaft being provided with a hand-wheel for turning it on the side of base opposite belt.
90

To hold the dynamo down on runners b after adjustment, plates K', Fig. 2, are provided, which bear on top of the ends of the dynamo bed-plate G', and are held down by bolts g, extending up through slots in bed-
95 plate G'. The nuts on these bolts are loosened before the screws J are adjusted, and are tightened afterward. The openings in bed-plate G', through which bolts g pass, are large enough to permit of the adjustment. The
100 commutator L of dynamo projects through opening H on this same side of the base F, and access is thus given to the commutator-brushes for inspection, adjustment, or renewal

while the engine is running. The switch-board M, Fig. 1, of dynamo is secured to the outside of base F above opening H, bringing it also within convenient reach upon the same side of the base. The throttle-valve C of engine is also turned to this side, as shown in the drawings. The resistance-box N, which is in the field-circuit of the dynamo, is also inclosed within the hollow base at the end opposite the cylinder, the face of the box with its adjusting hand wheel or crank being on the same side of the hollow base with the switch-board. When the dynamo is provided with a compound field-magnet winding, and is self-regulating, the resistance-box is not employed.

The arrangement of the parts described enables the engine to be stopped and started, and the dynamo to be handled from one side of the base, which not only insures safety from the running belt and convenience, but makes less room necessary, since the belt side of the engine can be placed close to the wall or other obstruction, limiting the space in one direction.

What I claim is—

1. The combination, with an engine and a hollow base, of a dynamo-electric machine mounted upon an extension of the base, at the cylinder end thereof, the shaft of the dynamo being arranged transversely with relation to such hollow base, and projecting clear from the opposite sides of such base, a commutator at one end of such dynamo-shaft open to access, and a pulley at the other end of such dynamo-shaft, connected by a belt with the

driving-wheel of engine, substantially as set forth.

2. The combination, with an engine and a hollow base upon which it is mounted, of a dynamo-electric machine within the base, driven by a belt from the engine and mounted on runners, screws adjusting the dynamo-electric machine to tighten belt, and a mechanism turning said screws and operated from one side of base, substantially as set forth.

3. The combination, with an engine having the operating-wheel of its throttle-valve located upon the side opposite the driving-wheel, and a hollow base upon which said engine is mounted, of a dynamo-electric machine mounted upon runners on an extension of said base, at the cylinder end thereof, the shaft of the dynamo being arranged transversely with relation to said base, and projecting clear from the opposite sides of such base, a belt connecting the driving-wheel of engine and pulley of dynamo on one side of base, the dynamo-commutator open to access on other side of base, adjusting-screws for moving dynamo to tighten belt, and mechanical connections for adjusting said screws from the side of base opposite driving-belt, substantially as set forth.

This specification signed and witnessed this 25th day of June, 1885.

JONATHAN H. VAIL.

Witnesses:

A. W. KIDDLE,
E. C. ROWLAND.