No. 689,567. Patented Dec. 24, 1901.

J. A. SECOR.

ENGINE FRAME.

Application filed Sept. 11, 1900.)

(No Model.)

3 Sheets—Sheet 1.

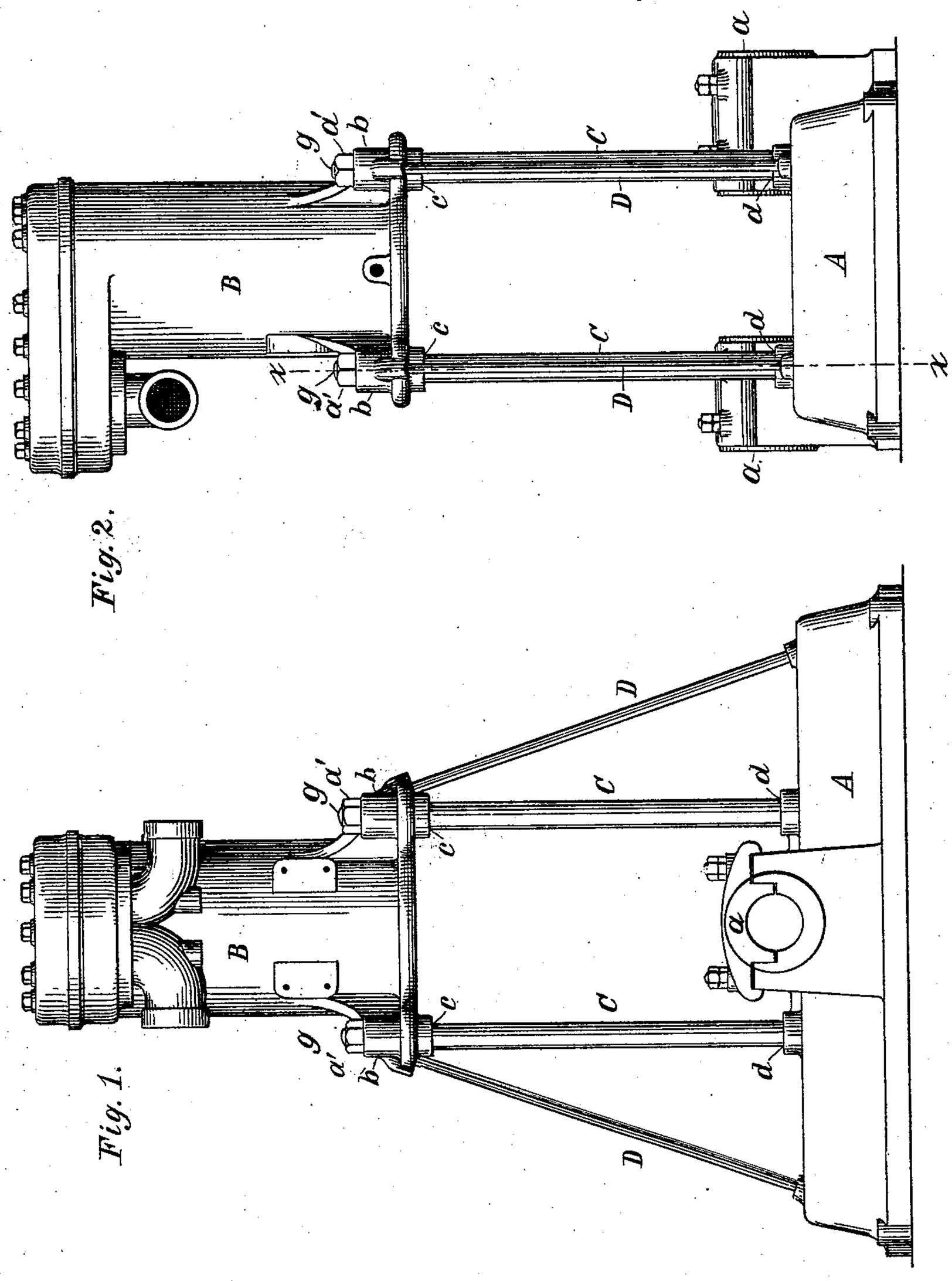

Fig. 2.

Fig. 1.

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Fig. 3.

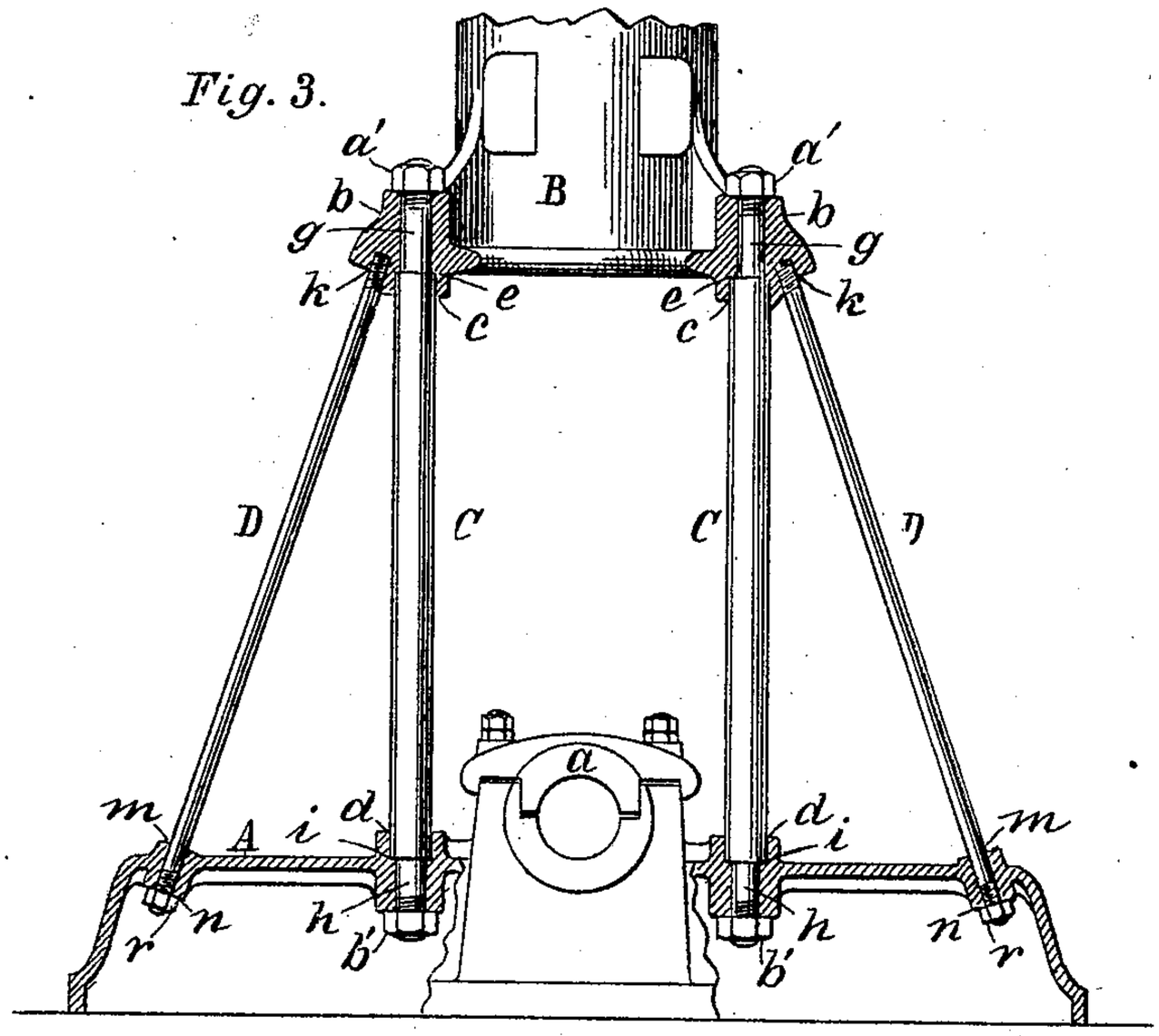

Fig. 4.

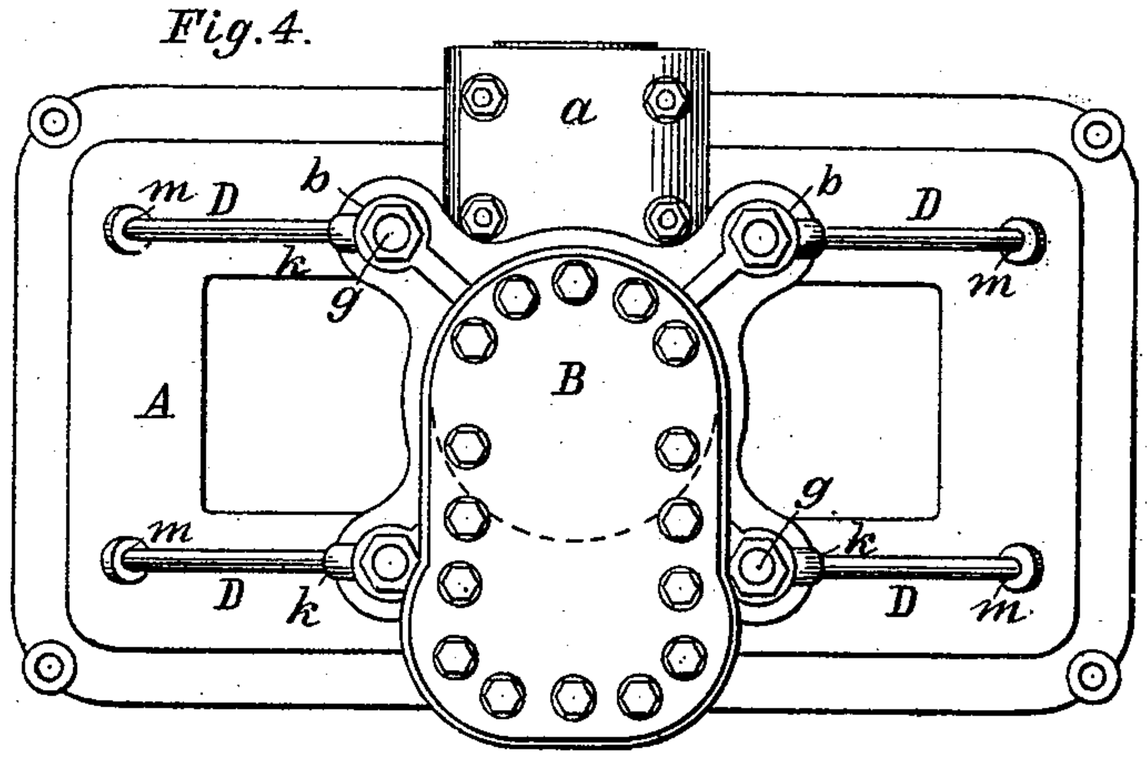

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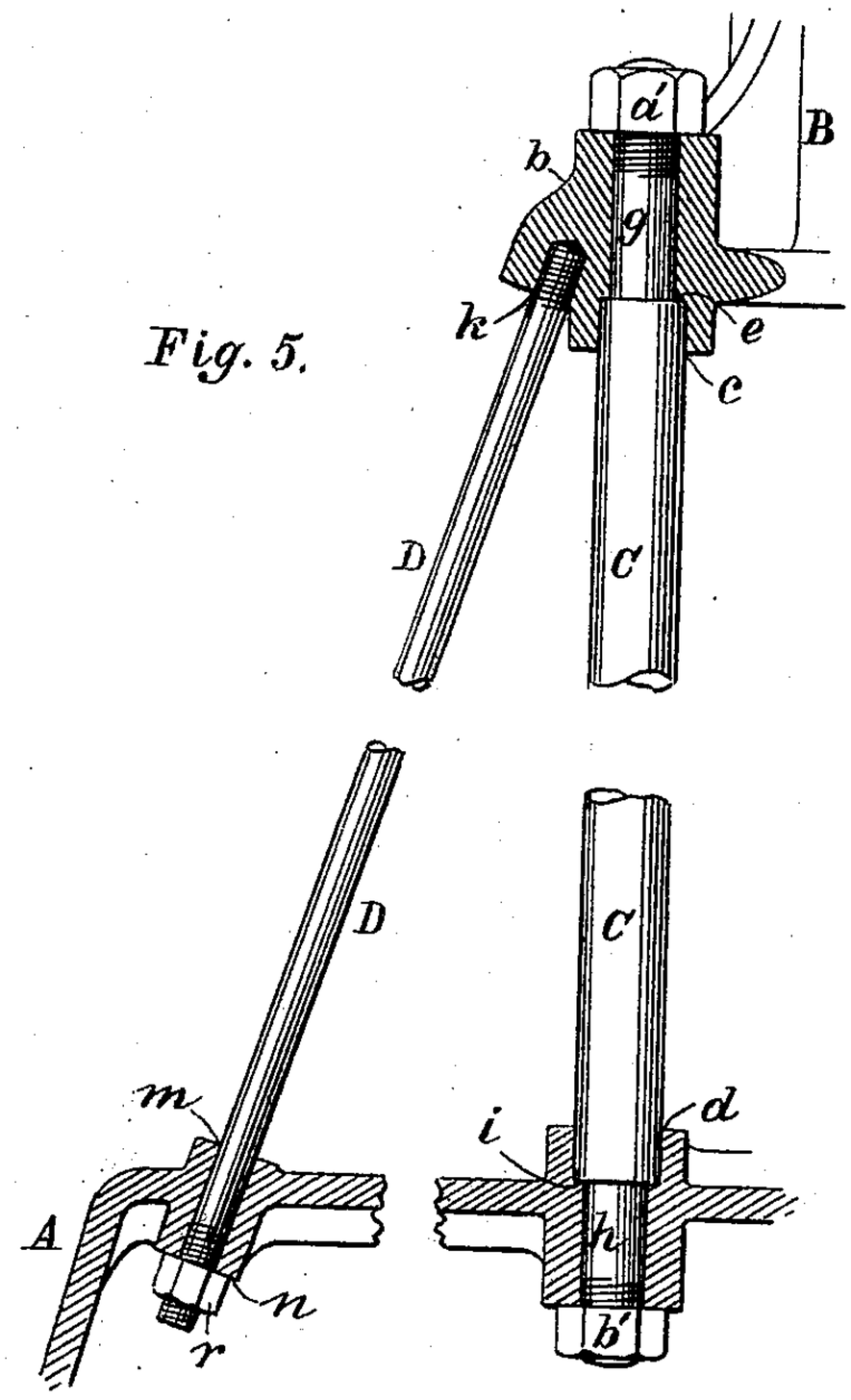
Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN A. SECOR, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE GENERAL POWER COMPANY, A CORPORATION OF NEW JERSEY.

ENGINE-FRAME.

SPECIFICATION forming part of Letters Patent No. 689,567, dated December 24, 1901.

Application filed September 11, 1900. Serial No. 29,711. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. SECOR, a citizen of the United States, residing in the borough of Brooklyn, in the city of New York, in the State of New York, have invented certain new and useful Improvements in Engine-Frames; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an end elevation of an engine-frame made according to my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical longitudinal sectional view of the same, taken in the line *x x* of Fig. 2. Fig. 4 is a plan view of the same. Fig. 5 is a detail view, on a larger scale, still further illustrating my said invention.

This invention relates to the frames of vertical engines, using the term "frame" as including the cylinder as a part of the frame. It is applicable to motors of this type, whether operated by steam, explosive fluids, compressed air, or other means. Its object is to simplify the structure of such motors, permit their more economical manufacture, provide for greatly-increased firmness and stability of the motor-cylinder in its relations to other parts of the frame, and to promote the greater durability and working life of the engine under the many and severe vicissitudes of use under ordinary conditions of wear and tear.

To this end the invention comprises certain new and useful combinations of parts hereinafter fully set forth and specified.

A is a horizontal bed-plate which is hollowed out underneath, as more clearly shown in the sectional view, Fig. 3, to provide room for the ends of the straining-braces and nuts, herein presently described. On this bed-plate may be provided the bearings, which are shown at *a*, for the crank-shaft of the motor.

B is the cylinder of the motor, which may be of any desired size, shape, or proportion, according to the variety to which the motor, whether explosive, steam, or other, may belong. The cylinder at its lower end is provided with outwardly-extended lugs *b* or equivalent projections. In these are provided vertical sockets *c*, which are coincident with vertical sockets *d*, hereinafter described, of the bed-plate below.

C represents standards which rise from the bed-plate and upon which the cylinder is supported. The upper and lower ends, respectively, of the standards are shouldered, as shown at *e* and *i* in Figs. 3 and 5, the upper end portions *g* of the standards having the thus relatively-reduced diameters being inserted into the sockets *c* of the cylinder-lugs *b*, while the correspondingly-reduced lower end portions *h* of the standards are inserted in the sockets *d* of the bed-plate. The standards are supported by their shoulders *i*, bearing upon the bed-plate, while the cylinder is supported upon the shoulders *e* at the upper parts of the standards. Any desired number of standards may be employed; but ordinarily four is sufficient for purposes of utility, and such number is ordinarily to be preferred. The extremities of the standards may when desired be extended beyond the respective sockets in which they are placed and may be threaded to receive nuts *a' b'*, as shown in Figs. 3 and 5. In each of the lugs *b* is an oblique internally-screw-threaded bore *k*. At proper points in the bed-plate below are non-threaded bores *m*, the axis of each of which is coincident with the axis of the threaded bore *k* in the cylinder-lug above it and with which, as presently herein explained, it is designed to coöperate. The surface surrounding the lower end of each bore *m* in the bed-plate should be made flat, or approximately so, in a plane at right angles to the axes of the said bore and the corresponding threaded bore *k* of the cylinder-lug above to provide a nut-seat *n*, for a purpose herein presently explained.

At D are oblique tension-braces, each of which is screw-threaded at its two opposite ends. The upper end of each brace is firmly screwed into one of the internally-threaded bores *k* of the cylinder-lugs *b*, while its lower end is passed through the coincident bore *m* below in the bed-plate. The screw-threaded lower extremity of each tension-brace is extended below the bottom of the bore *m*, through which it is passed, and has upon it a nut *r*, which rests snugly upon the seat *n*,

provided by the surface around the lower end of the bore, as herein presently explained. The cylinder being duly placed upon the standard and the tension-braces being put in position as just described, the nuts *r* are turned to tighten upon their seats *n*, and consequently draw upon the tension-braces D, longitudinally straining the same to tighten the cylinder downward upon the standards with a compressive strain upon the latter, which said compressive strain resists the tensile strain exerted upon the tension-braces. The tension-braces thus not only tend to resist any lateral or horizontal thrust or displacement of the cylinder or deviation of the latter from its perpendicular position, but exert a positive and continuous strain upon the cylinder to hold the latter firmly upon the standards, thereby bringing the several parts into such relations of tensional and resisting pressure that each supports the other and greatly increased stability is afforded to the whole. At the same time the number of nuts and other devices as compared with those essential in ordinary engine-frames are greatly reduced in number and the expenses of manufacture are proportionately diminished, while for the reasons above indicated a much greater strength of frame in proportion to the weight of materials used therein is secured.

What I claim as my invention is—

An engine-frame comprising in combination a bed-plate having vertical sockets and oblique bores, a cylinder having vertical sockets and outwardly-extended lugs in which are oblique screw-threaded bores, vertical standards which have their shouldered upper and lower ends inserted in and shouldered on the shoulders of the vertical sockets of the cylinder and bed-plate respectively, oblique tension-braces which are screw-threaded at their opposite ends, each with its upper end screwed into a threaded oblique bore of a cylinder-lug and with its lower end passed through and projected below a correspondingly-oblique bore in the bed-plate, and nuts upon the lower extremities of the straining-braces and standards to tighten the same and compress the cylinder upon the standards, substantially as herein set forth.

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Witnesses:
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