

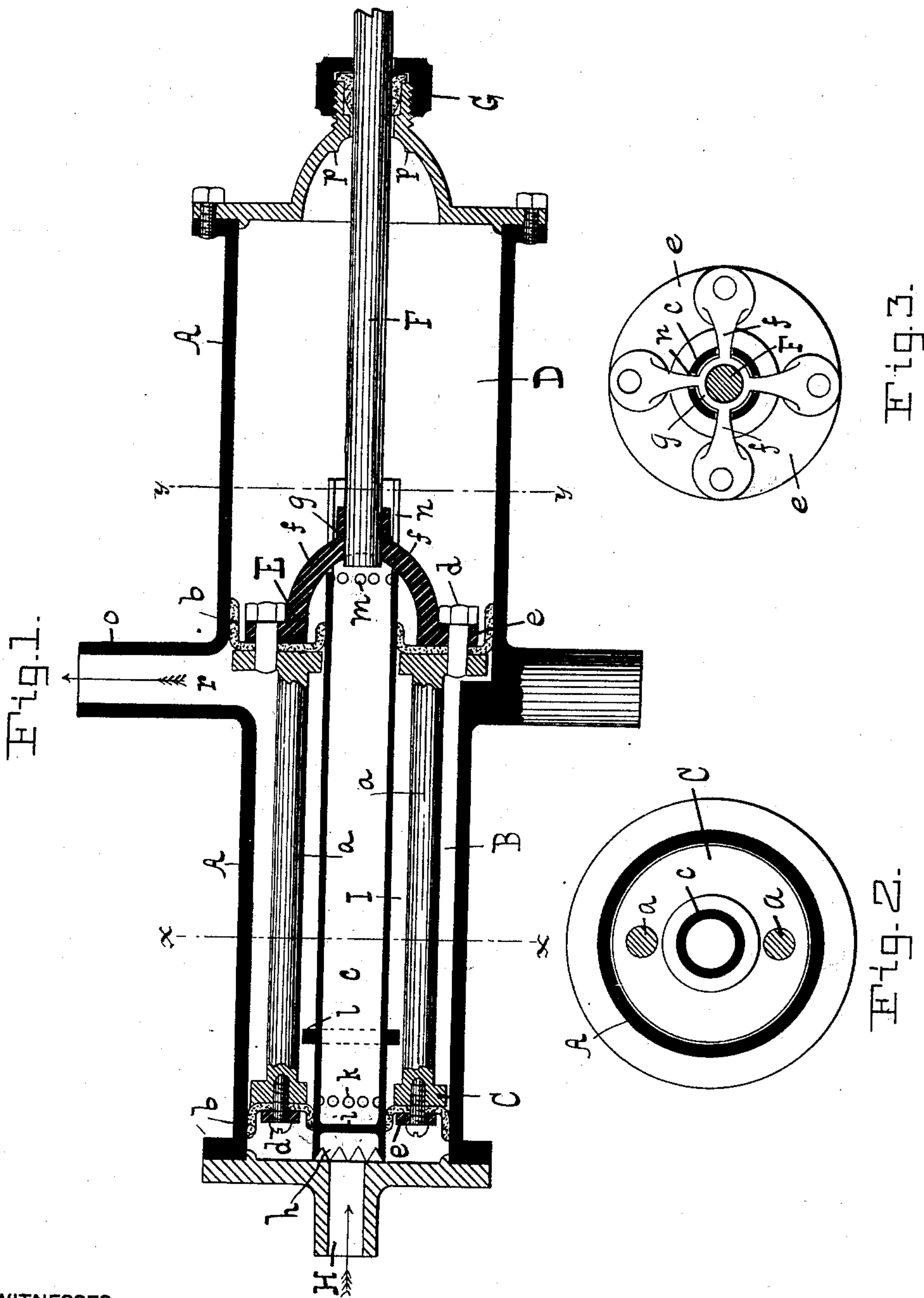
(No Model.)

G. HAYDN.

MOTOR.

No. 338,408.

Patented Mar. 23, 1886.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE.

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MOTOR.

SPECIFICATION forming part of Letters Patent No. 338,408, dated March 23, 1886.

Application filed October 19, 1885. Serial No. 180,369. (No model.)

To all whom it may concern:

Be it known that I, GEORGE HAYDN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Motors, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in motors; and it consists of a cylinder having differential diameters, which is provided with corresponding piston-heads that are attached together, and contains a central movable tube which is provided with suitable ports, by which the device is operated, as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view through the device; Fig. 2, a cross-section on line *x*, and Fig. 3 a cross-section on line *y*.

Similar letters refer to similar parts throughout the several views.

The letter A designates the cylinder, which has different diameters. The smaller one, B, contains a corresponding piston-head, C, and the larger one, D, contains the piston-head E, each of which are connected together by the rods *a*, by which they are rigidly secured together and made to work in unison. Both heads are provided and fitted with self-adjusting flexible packing *b*, that prevents any leakage between the said heads and cylinder and between the tube *c* and the heads, by having portions of the said material placed parallel to the surfaces of the said cylinders and tube, which is forced thereagainst by the pressure of the prime power.

The packing is secured to the heads C and E by means of the screws *d* and the clamping-rings *e*, which securely hold the body of the said packing and permit the flanges thereof to freely set themselves to the surface which they move against.

To the ring *e* of the large piston-head E are cast or secured the arms *f*, which unite and form the hub *g*, to which the piston-rod F is secured in any suitable manner, the piston-rod projecting from the cylinder through the stuffing-box G and secured to the ordinary

mechanism to impart rotary motion, or to a pumping-cylinder, as may be desired.

Through the two piston-heads extends the tube *c*, which is provided, first, with corrugations *h*, by which the steam or liquid is permitted to pass into the small cylinder from the supply-port H when the heads are in the position shown in Fig. 1; second, the partition *i*, which prevents the pressure from passing directly into the tube from the port H; third, the holes *k*, which form discharge and supply ports; fourth, the projection *l*, which forms a stop for the movable tube *c*; fifth, the holes *m*, which are for the same purpose as those *k*; and, sixth, the slots *n*, in which the arms *f* fit, which permits the end of the tube *c* to project beyond the hub *g*, that it may come in contact with the projection *p* on the large cylinder-head, and thereby shift its position as the heads advance.

To the outside of the cylinder are cast two trunnions, *o*, on which the same may oscillate, if it is desired to equip the engine in that manner, one of which is hollow and forms the discharge or exhaust port *r*.

The operation is as follows: The prime power is applied (either steam or liquid) through the port H, which, when the heads are in the position shown, moves them to the right until the slotted end of the tube *c* comes in contact with the projection *p*, which prevents it from moving forward, and the heads continuing to do so alters the relative position of the two, which places the holes *k* in the tube on the opposite side of the piston-head C to that which they formerly occupied, thereby opening communication between the large end D of the cylinder and the supply-ports H, which permits the pressure to act on the large head, and it having twice the area of the small one overcomes the pressure thereon and moves the heads to the left until the end of the tube containing the corrugations *h* comes in contact with the small head of the cylinder and places it in the position formerly occupied, which cuts off communication with the large end and permits the pressure to only act on the small one, and, at the same time

permitting the steam or liquid to be exhausted by it passing from the large end into the tube through the holes *m*, from thence to the space I between the heads, through the holes *k*, and out by way of the exhaust-port *r*.

Having described my invention, what I claim is—

1. The combination of the cylinder A, having differential diameters, the piston-heads C and E, the tube *c*, the corrugations *h*, the partition *i*, the holes *k* and *m*, and the packing *b*, arranged to pack the joints between the heads and the cylinder.

2. The combination of the cylinder A, having differential diameters, the piston-heads C

and E, the movable central tube, *c*, corrugations *h*, the partition *i*, and the holes *k* and *m*, for the purpose set forth.

3. The combination of the cylinder A, having differential diameters, the piston-heads C and E, the central movable tube, *c*, and the trunnions *o*, one of which is arranged to form the exhaust-port *r*, as herein specified.

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

GEORGE HAYDN.

Witnesses:

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