E. Savoral,

Oscillating Steam Engine.

No. 52,451. Patented Feb. 6, 1866.

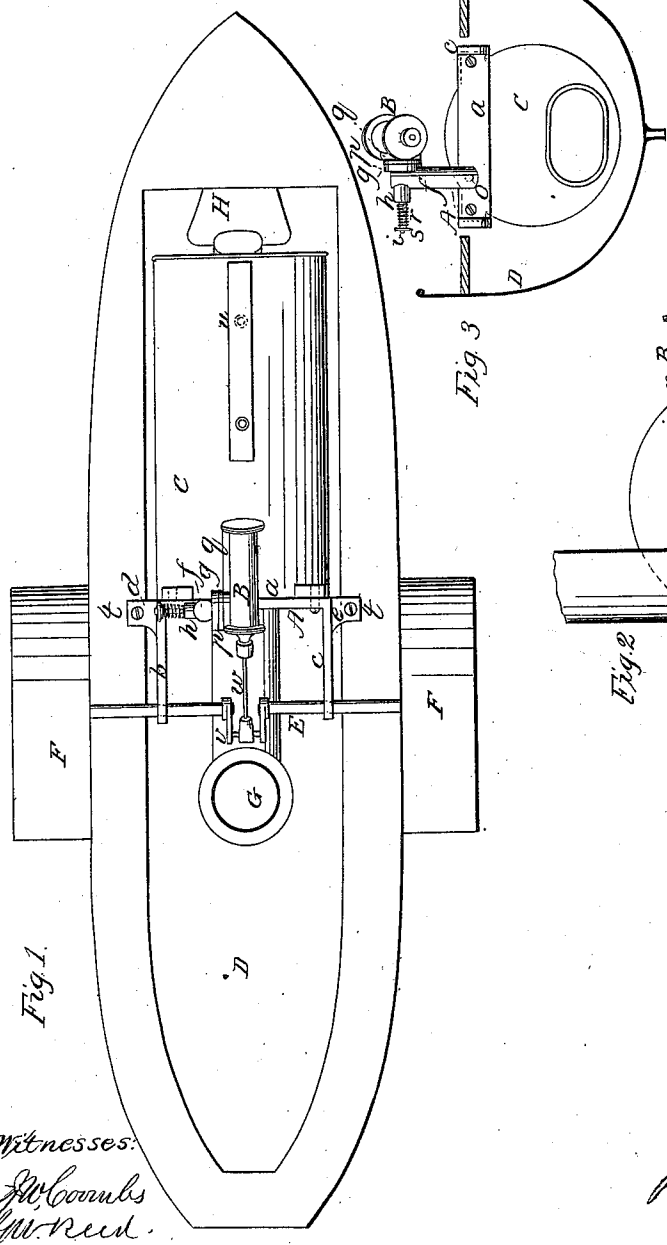

Fig. 1.

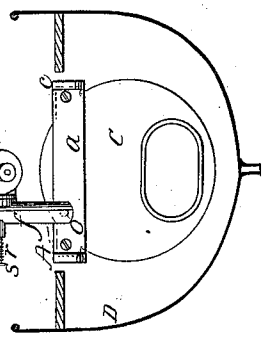

Fig. 3

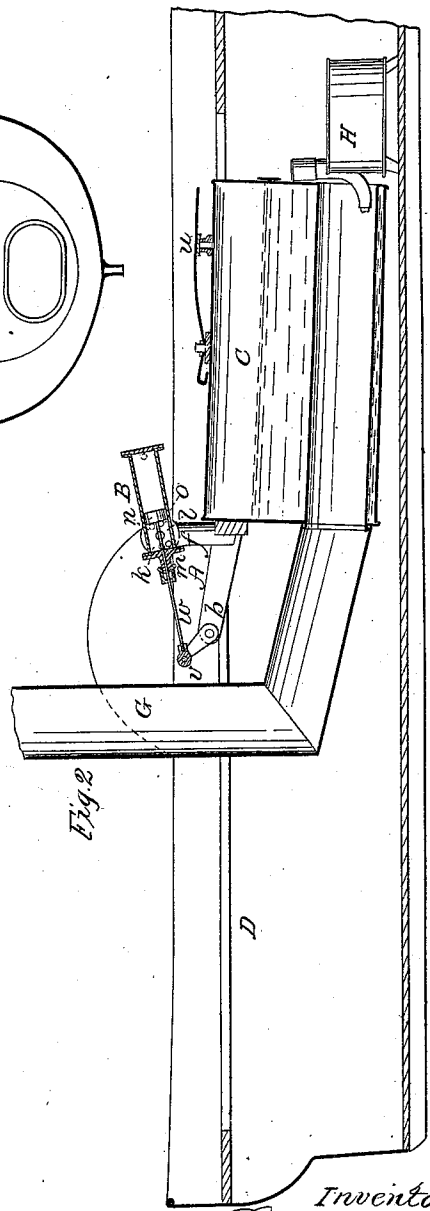

Fig. 2

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UNITED STATES PATENT OFFICE.

EDVARDT SAVORAL, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **52,451**, dated February 6, 1866.

To all whom it may concern:

Be it known that I, EDVARDT SAVORAL, of No. 99 Cannon street, of the city, county, and State of New York, have invented a new and Improved Toy Steam-Engine; 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, forming part of this specification, in which—

Figure 1 is a plan of a toy steam-engine constructed according to my invention applied to a toy boat. Fig. 2 is a longitudinal central vertical section of the same. Fig. 3 is an end view of the engine and boiler and a transverse section of a toy boat.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in the construction of oscillating toy steam-engines in a simple, effective, and cheap manner by making the engine-frame and the supports for the crank-shaft in a single piece, which also contains the steam-passage, and by the means of which piece the steam-cylinder is supported, its connection with the boiler is made, and the boiler is held in place by simply attaching the said simple engine-frame to the boiler and to the sides of the toy boat.

It also consists in supporting an oscillating cylinder by only one trunnion or stem attached to the cylinder, and keeping the cylinder in position by means of a spiral spring and nut, and admitting steam at both sides of the piston of such an engine.

To enable others skilled in the art to make and use my invention, I will further describe its construction and operation.

A is an engine-frame in one piece, consisting of a transverse piece, *a*, of proper size and strength, having two arms, *b* and *c*, one at each end, projecting from it at right angles, or nearly so. This transverse piece *a* has a flange at each end, *d* and *e*, Fig. 1, and also a column, *f*, which contains the steam-passages. On one side, at the upper end of the said column, is a round disk, *g*, cast with it in one piece, and standing at right angles with the transverse piece *a*, and at the other side of the column, in line with the center of the disk *g*, is a hub, *h*. Through the center of this disk and hub a hole is drilled of sufficient size to admit the trunnion *i* of the cylinder B. The said disk *g* has upon its face two steam-ports, *k* and *l*, Fig. 2, which connect with the steam-passage in the column, and also two exhaust-ports, *m* and *n*, which pass outwardly from the face of the disk. This engine-frame A is attached to one of the heads of the boiler C by means of screws, and the steam-passage of the column is by this attachment made to communicate with the boiler, as shown at *o*, Fig. 3. By means of the two flanges *d* and *e*, Fig. 1, this frame A is then attached to the toy boat D, as shown at *t t*, Fig. 1.

The steam-cylinder B is made on one side, near the end or head, with a disk, *p*, of the same size as the disk *g*. This disk *p* has two steam-ports, corresponding with the steam-ports and exhaust-ports of the disk *g* in such manner that when one steam-port is open for the reception of steam the opposite exhaust-port is open for the escape of steam.

The cylinder B receives steam at the opposite end from where it is supported by means of a passage, *q*, leading from the disk *p* to that end of the cylinder, and exhausts through the same when the cylinder receives steam at the end where it is supported.

The cylinder is constructed in any well-known manner, and is supported by the stem *i* and held in position by means of a spiral spring, *r*, and nut *s*, which causes the faces of the disks to be kept always in close contact, to prevent the steam escaping from between them except through the proper channel.

The crank-shaft E is supported in bearings in the two arms *b* and *c* of the engine-frame A, and is provided at each end with a paddle-wheel, F.

The crank *v* is connected directly with the piston-rod *w*.

The boiler C is provided with a smoke-pipe, G, and a safety-valve, *u*, and by means of a small lamp, H, constructed for that purpose, steam may be raised and the engine be set in motion.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The frame A, constructed with a hollow column, *f*, for supporting the cylinder, and attached to the boiler and the hull of the vessel, substantially as herein specified.

2. The combination and arrangement of the supporting-column, the single cylinder-trunnion, the valve-disks *g* and *p*, spring *r*, and nut *s*, substantially as and for the purpose herein set forth.

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