

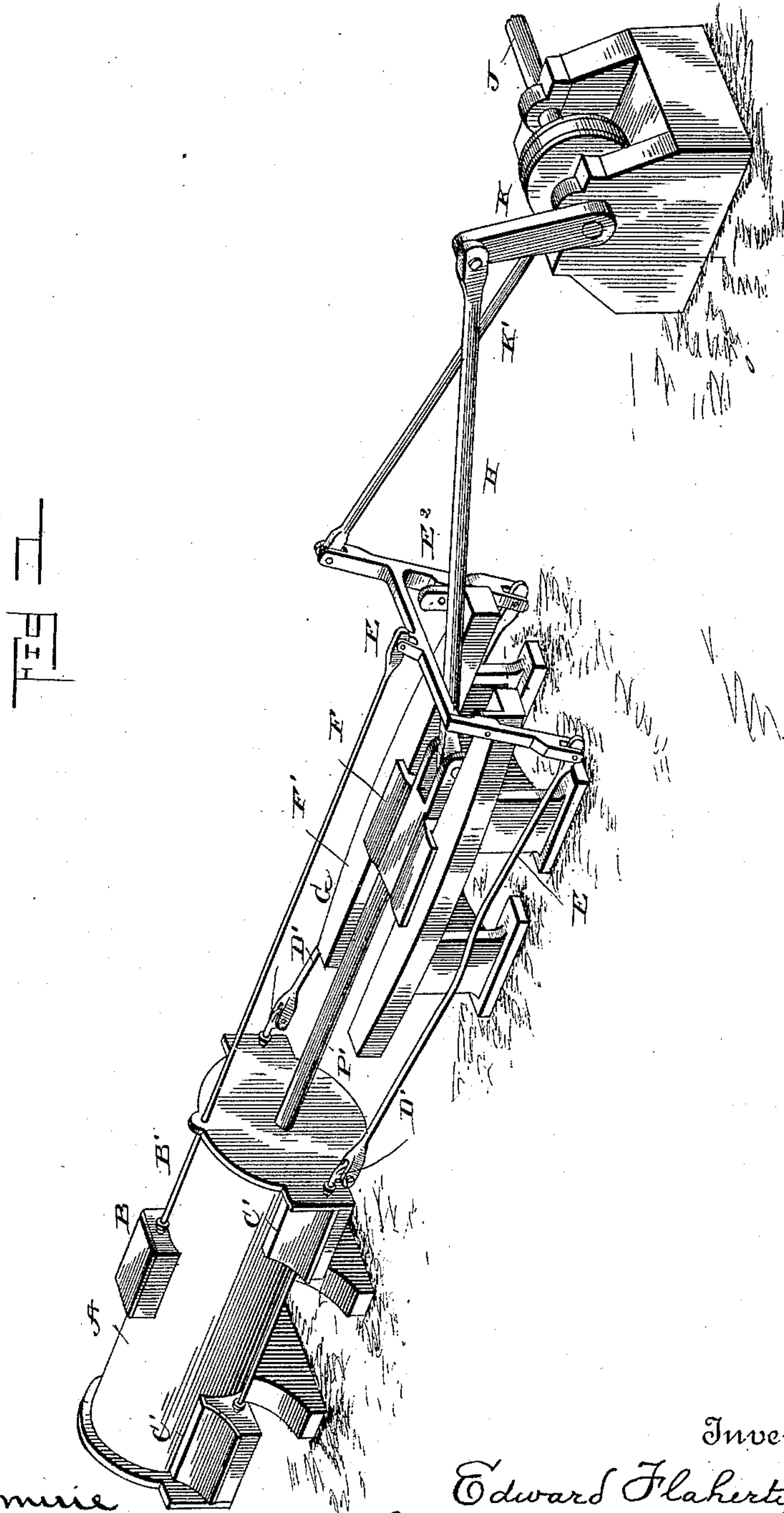
(No Model.)

2 Sheets—Sheet 1.

E. FLAHERTY.
STEAM ENGINE.

No. 467,501.

Patented Jan. 26, 1892.



Witnesses

John Imrie
Wm. J. Lane,

Inventor

Edward Flaherty,

By his Attorney,

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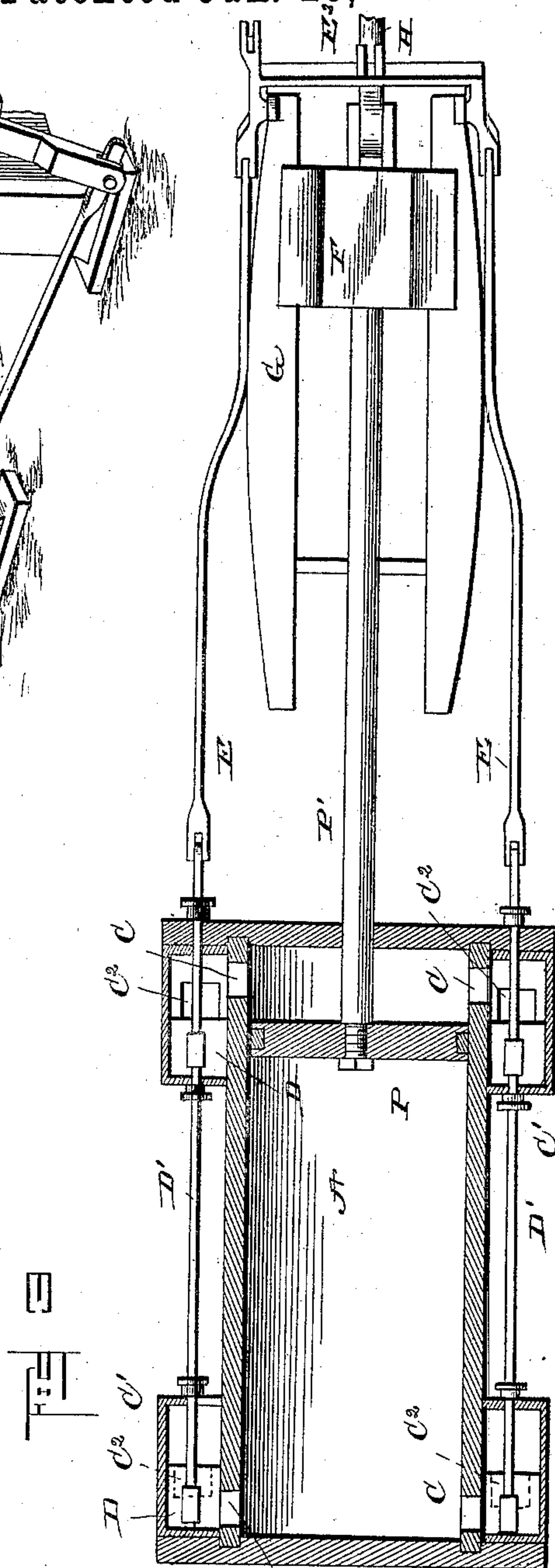
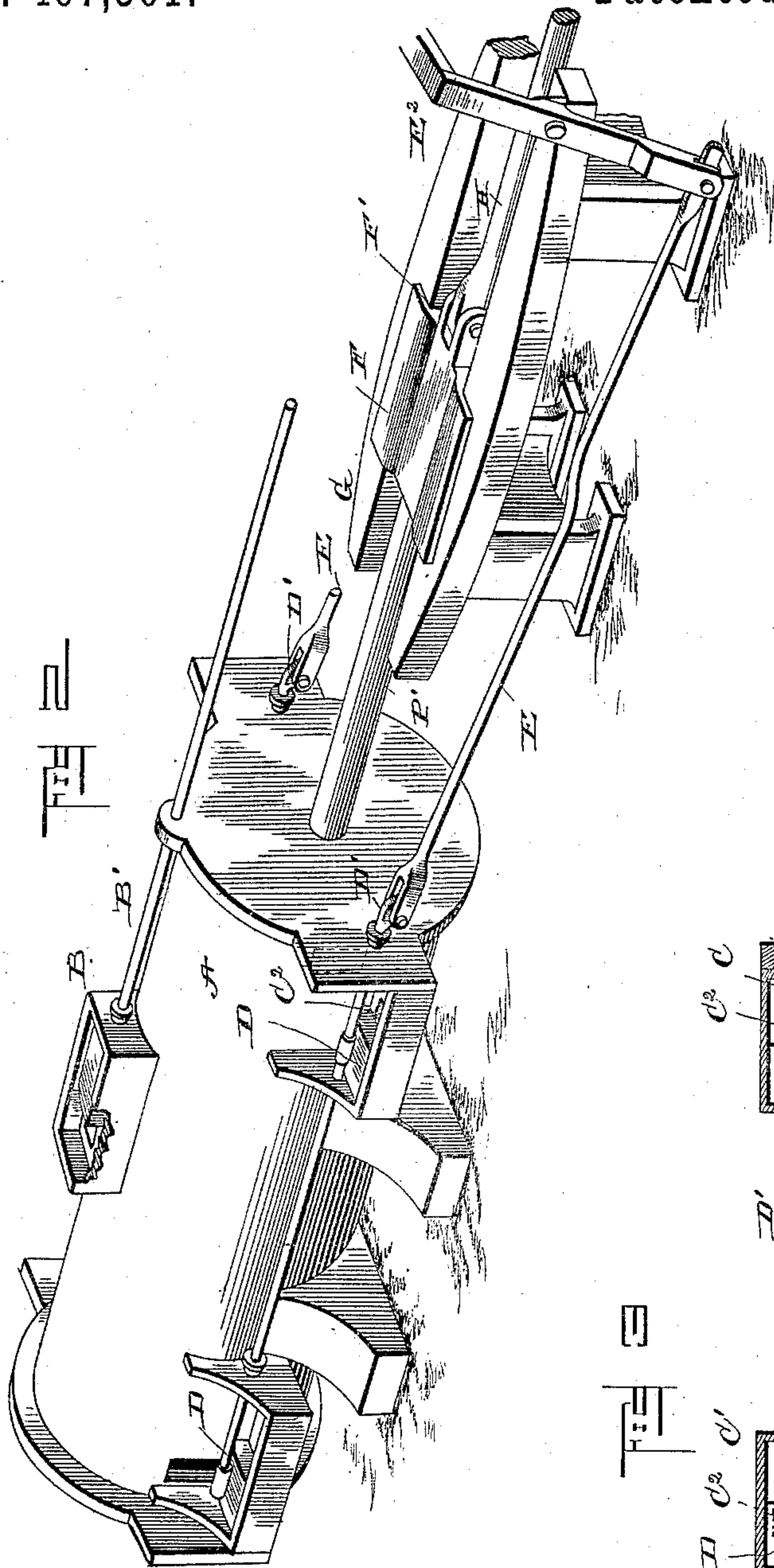
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2 Sheets—Sheet 2.

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STEAM ENGINE.

No. 467,501.

Patented Jan. 26, 1892.



Witnesses

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UNITED STATES PATENT OFFICE.

EDWARD FLAHERTY, OF MAHANOEY CITY, PENNSYLVANIA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 467,501, dated January 26, 1892.

Application filed May 12, 1891. Serial No. 392,433. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FLAHERTY, a citizen of the United States, residing at Mahanoy City, in the county of Schuylkill and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam-engines; and it consists of the construction and arrangement of the parts hereinafter described, and pointed out in the claims.

The object of my invention is to avoid as much back-pressure as possible—in fact, to reduce same to such an extent as not to interfere with the accurate working of the piston by an alternate double exhaust working simultaneously with the ingress of live steam.

In the accompanying drawings, wherein like letters of reference are used to designate similar parts in the several views, Figure 1 represents a perspective view of a cylinder embodying the main features of my invention. Fig. 2 represents a horizontal central section of said cylinder. Fig. 3 represents a perspective view of the cylinder and preferred form of operating connections.

Referring to the drawings, A designates the cylinder, having a steam-chest B of ordinary construction, whose slide-valve is operated by a slide-rod B'. On each side of said cylinder at each end is located an exhaust-port C, inclosed by a chambered casing C', having a bottom opening C². Within each of said casings C' is mounted a slide-valve D, bearing upon and adapted to slide off the bottoms of said casings and open or close the openings C². The said valves D are connected up in pairs by connecting-rods D', to which are secured drive-rods E'. The openings C² are located adjacent to the ends of the cylinder on each side, and the valves D alternately open and close each pair, thereby providing a simultaneously-operating double exhaust. The slide-rod B' is connected to the central top portion of an oscillating frame E, and the drive-rods D' are pivotally secured to the lower ends of side arms E² of said frame, and consequently as the slide-valve of chest B is

drawn back to admit steam in front of the piston P the openings C² at the inner end of the cylinder are uncovered simultaneously to exhaust the steam behind said piston. When said slide-valve is shoved forward to admit steam behind the piston, the said inner openings C² are closed and the like openings at the outer end of the cylinder are uncovered to exhaust the steam in front of the piston. The piston-rod P' is connected to a channeled slide F, moving on ways F', carried by a support G, the said frame E being also pivotally connected to said support. Said slide F has a link-rod H attached to the rear thereof and at its opposite end connected to a crank-shaft J, which may be the main driving-shaft, and has thereon an eccentric K, provided with an arm K', secured to the oscillatable frame E.

In view of the construction set forth the piston P operates the slide F, the latter in turn actuates the rod H to revolve the shaft J, and the movement of the eccentric K through its arm K' oscillates the frame E. The frame E, as before set forth, controls the movement of the slide-valve of the chest and the valves D in the manner and for the purpose stated.

It will be observed that the parts are all timed to operate conjointly and continuously, the one part facilitating and promoting the proper action of the other.

The construction as set forth may be applied in connection with any form of engine, especially the cylinder, with double-valved exhaust connection, and the rods joining said valves or slides in pairs.

The other mechanism set forth is more especially adapted for stationary engines, and in connection with the construction of cylinder, as set forth, provides a positively acting and beneficial acquisition to said form of engine.

It will be understood that the dimensions of the several parts may be varied at will, and the length of the several strokes, including piston and connecting and drive rods, will be regulated proportionate to the horsepower.

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

1. In a steam-engine, the combination, with

a cylinder provided with a steam-chest, exhaust-ports, and with valves for the latter and the steam-chest, of an oscillating frame disposed in advance of the cylinder and connected at its respective ends with the inlet and exhaust valves, substantially as and for the purpose set forth.

2. In a steam-engine, the combination, with a cylinder provided at its top with a steam-chest and at its sides with exhaust-ports and valves for said chest and ports, of an oscillating frame comprising vertical side members and a connecting member and rods connecting the inlet and exhaust valves, respectively, with the transverse member of the frame and with the lower end of the vertical members thereof, substantially as and for the purpose set forth.

3. In a steam-engine, the combination, with a cylinder provided at its top with a steam-chest and at each side and end with exhaust-ports and valves for said chest and ports, of an approximately inverted-U-shaped frame having its vertical members journaled to standards, rods connecting the exhaust-valves with the free ends of said frame, a rod connecting the transverse portion of the latter with the inlet-valve, and means for oscillating the frame, substantially as and for the purpose set forth.

4. In a steam-engine, the combination, with a cylinder having a steam-chest at its top, provided with a slide-valve, exhaust-casings provided upon the exterior of the cylinder at

each side and end, and slide-valves working in said casings and connected up at each side in pairs, of an oscillating frame journaled in advance of the cylinder and consisting of two vertical members and a transverse member connecting the latter near their upper ends, a rod connecting the inlet-valve centrally with the transverse member of the frame, and rods connecting the exhaust-valves with the lower ends of said vertical members, substantially as and for the purpose set forth.

5. In a steam-engine, the combination, with a cylinder provided with a steam-chest and with exhaust-casings at each side and end, slide-valves working in said chest and casings, the piston and piston-rod, guides for the latter, and a shaft connected with the piston-rod and provided with an eccentric, of an oscillating frame comprising two vertical members journaled to the piston-rod guides and a transverse member connecting the same above the journals, a rod connecting the transverse member with the inlet-valve, rods connecting the lower ends of the vertical members with the exhaust-valves, and an eccentric-rod connecting the upper end of one of said vertical members with the shaft, substantially as and for the purpose set forth.

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

EDWARD FLAHERTY.

Witnesses:

JNO. F. DOLPHIN,

THOMAS MYERS.