W. S. BACON.

Improvement in Gearings for Valve Movements for Steam-Engines.

No. 132,130. Patented Oct. 15, 1872.

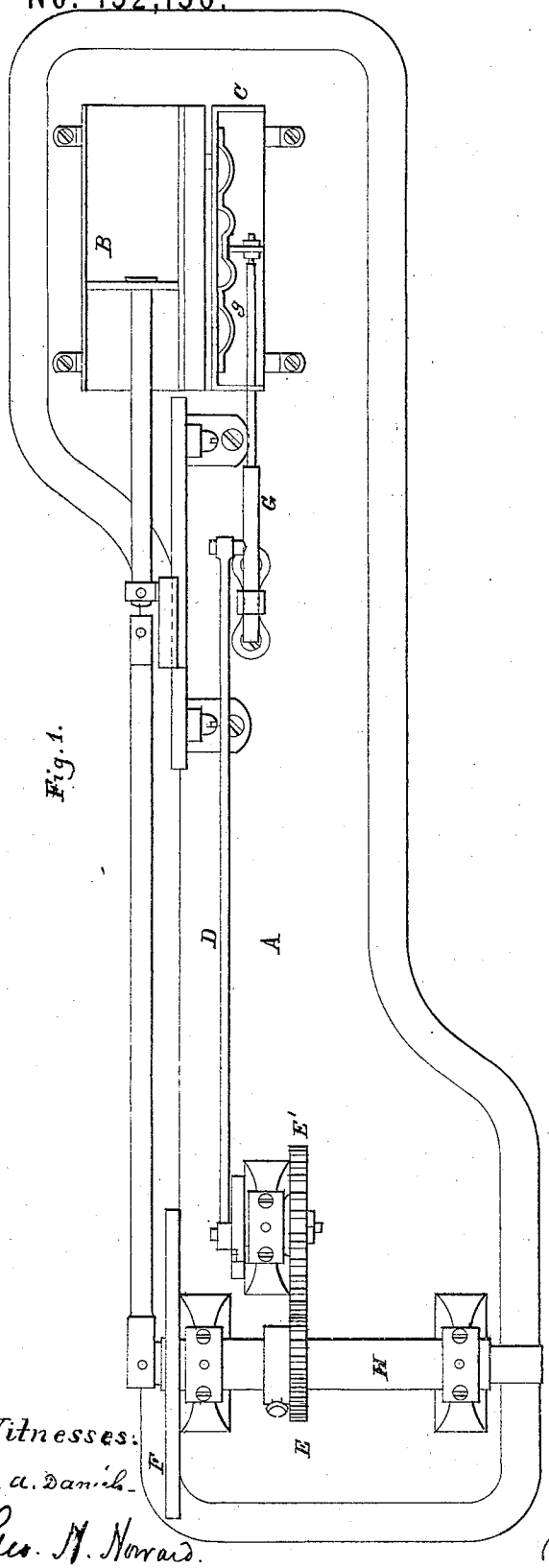


Fig. 1.

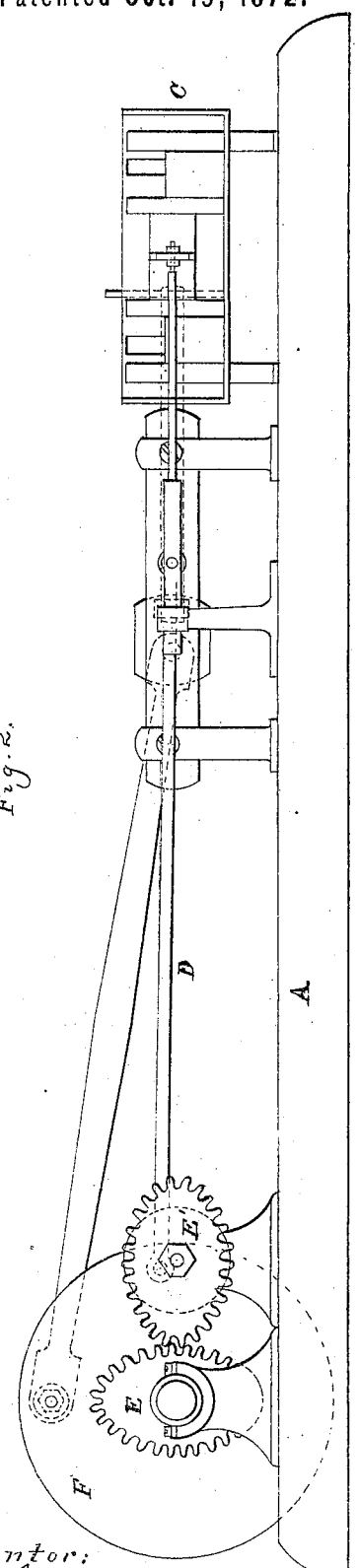


Fig. 2.

Witnesses:

H. A. Daniels

Geo. N. Norris.

Inventor:

Wm S. Bacon by Myers & Co. Attys

A.M. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

UNITED STATES PATENT OFFICE.

WILLIAM S. BACON, OF SULPHUR SPRINGS, OHIO.

IMPROVEMENT IN GEARINGS FOR VALVE-MOVEMENTS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **132,130**, dated October 15, 1872.

To all whom it may concern:

Be it known that I, WILLIAM S. BACON, of Sulphur Springs, in the county of Crawford and State of Ohio, have invented certain Improvements in Valve-Movement for Steam-Engines, of which the following is a specification:

My invention relates to valve-gear of steam-engines, and consists in certain modifications and improvements in the construction of the same, as hereinafter shown and described.

In the accompanying plate of drawing which illustrates my invention and forms a part of the specification thereof—

Figure 1 is a plan view of my improved valve-gear, and Fig. 2 is a side view of same.

In the drawing referred to, letter A designates the frame supporting the apparatus; B, the cylinder; C, the steam-chest; D, the valve connecting-rod; E E′ designate the elliptical spur-gears; F, the crank-wheel; G, the valve guide-rod; *g*, the valve-stem; and H, the engine-shaft. My improvements consist in so constructing and arranging the valve-gear as to produce a movement that steam can be used expansively with single valve. To effect this the valve must have a varied motion quite different from that obtained by the small crank or eccentric alone, as commonly used, which, when set-screwed or keyed, always remains stationary relative to the engine-crank, which condition prevents the use of steam expansively without excessive compression or too early exhaust, or both; hence, a "cut-off" is frequently placed on the back of the valve, moved by an additional eccentric, and consequent loss of power results. In my improvements it is proposed to so move the single valve by retarding and increasing its motion that the steam can be cut off at any point of stroke desired, and yet keep the port open at the exhaust end to the extremity desired, or until the stroke of the piston is nearly completed, when the motion of the valve will be quickened and throw the other exhaust-port wide open, suddenly relieving the engine of exhaust steam almost instantly, thereby reducing the neutrality of the valve to a minimum. The elliptical-toothed gears E E′ are employed to accomplish this, and it will be observed, on examination, that the varied motion is obtained as each toothed gear alternates from a large wheel to a pinion, twice in each revolution of engine. The application of this principle to such purpose is also intended to save, to some extent, the power that drives the lower or under valve—that is, when a cut-off is used—and in addition to the gain of expansion to gain further by relieving the engine of exhaust steam much quicker than can be done with the ordinary eccentric unless greater movement is given, when, of course, greater friction will be incurred. By lengthening or shortening the crank on the small shaft the valve is practically shortened or lengthened, and thus adapted to cut off at the desired point.

I claim, in a device for valve-movement for steam-engines—

The elliptical spur-gears in combination with the valve, connecting-rod, guide-rod, steam-chest, and crank-wheel, all being constructed and operating substantially as set forth.

In testimony of this my application for Letters Patent of the United States for an improvement in valve-movement for steam-engines I hereunto subscribe my name the day and year first above written.

WILLIAM S. BACON.

Witnesses:

J. H. FRY, Jr.,

I. W. ABERNETHY.