# H. STIBBS.

## ENGINE GEARING.

No. 188,690. Patented March 20, 1877.

Fig. 1.

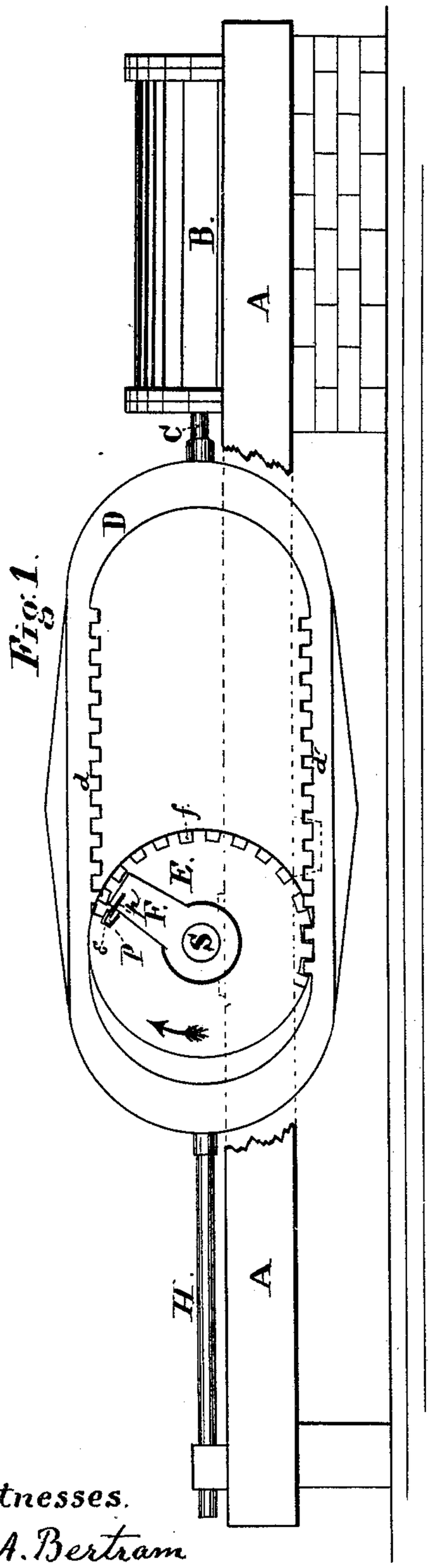
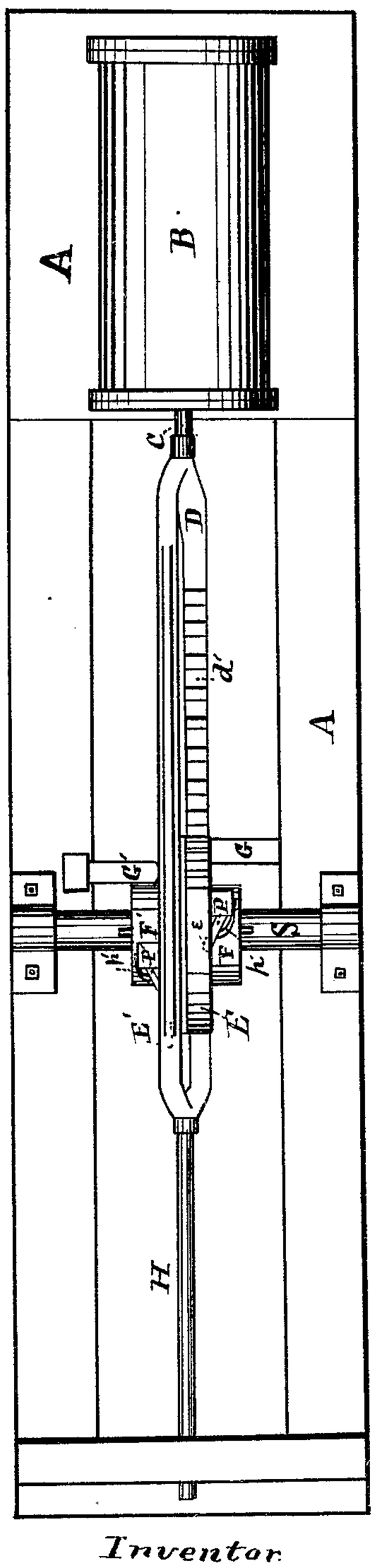



Fig. 2.




Witnesses.
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# UNITED STATES PATENT OFFICE.

HENRY STIBBS, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN ENGINE-GEARING.

Specification forming part of Letters Patent No. **188,690**, dated March 20, 1877; application filed February 17, 1877.

*To all whom it may concern:*

Be it known that I, HENRY STIBBS, of the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Engine-Gearing; and I hereby declare the same to be fully, clearly, and exactly described as follows:

Many devices have been constructed having for their object to carry the cranks of engines past what are technically known as the "centers;" but heretofore the problem has not been successfully solved. The fly-wheel still retains its prestige as the best means for accomplishing the above result; but its use is open to many objections. The crank so universally used is also but a sorry expedient for converting reciprocating rectilinear into continuous circular motion, since it is obvious that the power varies with each position assumed by the crank. Where two cylinders are used, of course the crank answers very well, since the two cranks may be placed at right angles with each other; but with a single cylinder the power varies throughout the stroke, being measured by the perpendicular distance from the crank-pin to the line joining the centers; or, in other words, by the sine of the angle made by the crank with this line.

The efficiency of a given power is obviously greatest when the crank is in the middle of its stroke, and, by the device hereinafter described, it is practically kept there, the point of application of the power being always at a point perpendicularly above or below the shaft.

In the accompanying drawings, Figure 1 represents a side view of my engine, a portion being broken away to better illustrate its construction. Fig. 2 represents a plan view of the device.

A represents the bed of an ordinary stationary engine, having a cylinder, B, of the usual construction. To the piston-rod C is attached, in any convenient manner, the piece D, having rows of cogs *d d'*, which mesh with similar teeth on the disks E E'. To the shaft S are firmly keyed the cranks F F', which are furnished at their ends with pawls P P', having springs *p p'* to press the pawls against the cogged disks E E'. These disks turn loosely upon the main shaft S, and have steps *e*, in which the pawls P P' engage. The piece D is slightly inclined, as shown in Fig. 2, in order to bring its cogs into mesh with those upon the disks E E', between which is a flange or disk, *f*, to keep the piece D in place. Stops G G' are also attached to the bed A, and bear upon the piece D for the same purpose.

The operation of the device is as follows: As the piston moves—say, from right to left, as shown in the drawings—the lower row of cogs *d* engage with those on the disk E, and cause it to revolve in the direction of the arrow. The pawl P being in the step *e*, the crank F is also forced to revolve, and with it the shaft S. Pending this stroke the other disk E' also revolves, of course in the contrary direction, until at the end of its stroke its pawl P' falls into its step *e*, and on the return stroke of the engine the motion of the shaft S is continued by the disk E'. Should it be desirable to have the engine capable of backing, it is only necessary to reverse the pawl, or to have another pawl on the opposite side of the crank, and a corresponding step must be cut upon the disk.

At the end of the piece D is attached a guide-rod, H, which slides through a suitable box on the bed A. The object of this rod is, of course, to steady the entire mechanism.

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

1. In combination with the shaft S, the cranks F F', having pawls P P', and disks E E', each disk having a step, *e*, as set forth.

2. The disks E E', separated by flange *f*, in combination with the piece D, as set forth.

Witness my hand this 17th day of February, 1877.

HENRY STIBBS.

Attest:

R. D. WILLIAMS,

W. A. BERTRAM.