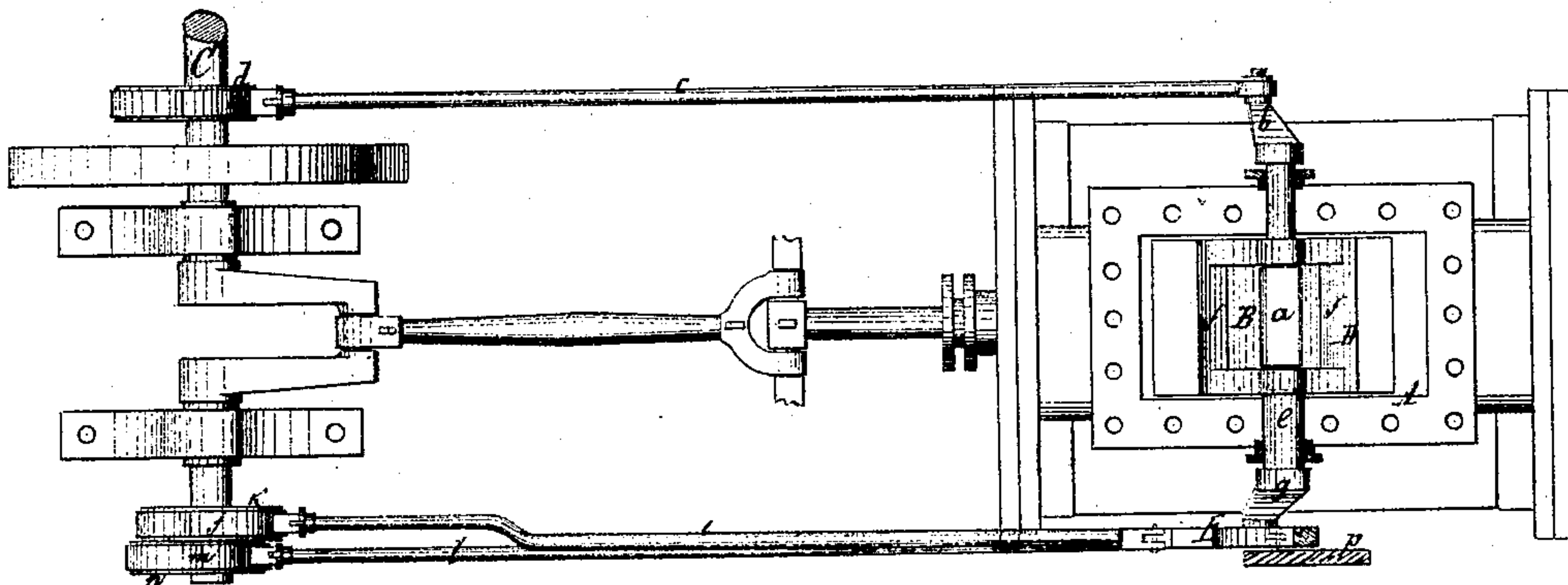


*J. Randles,*  
*Cut Off Valve.*

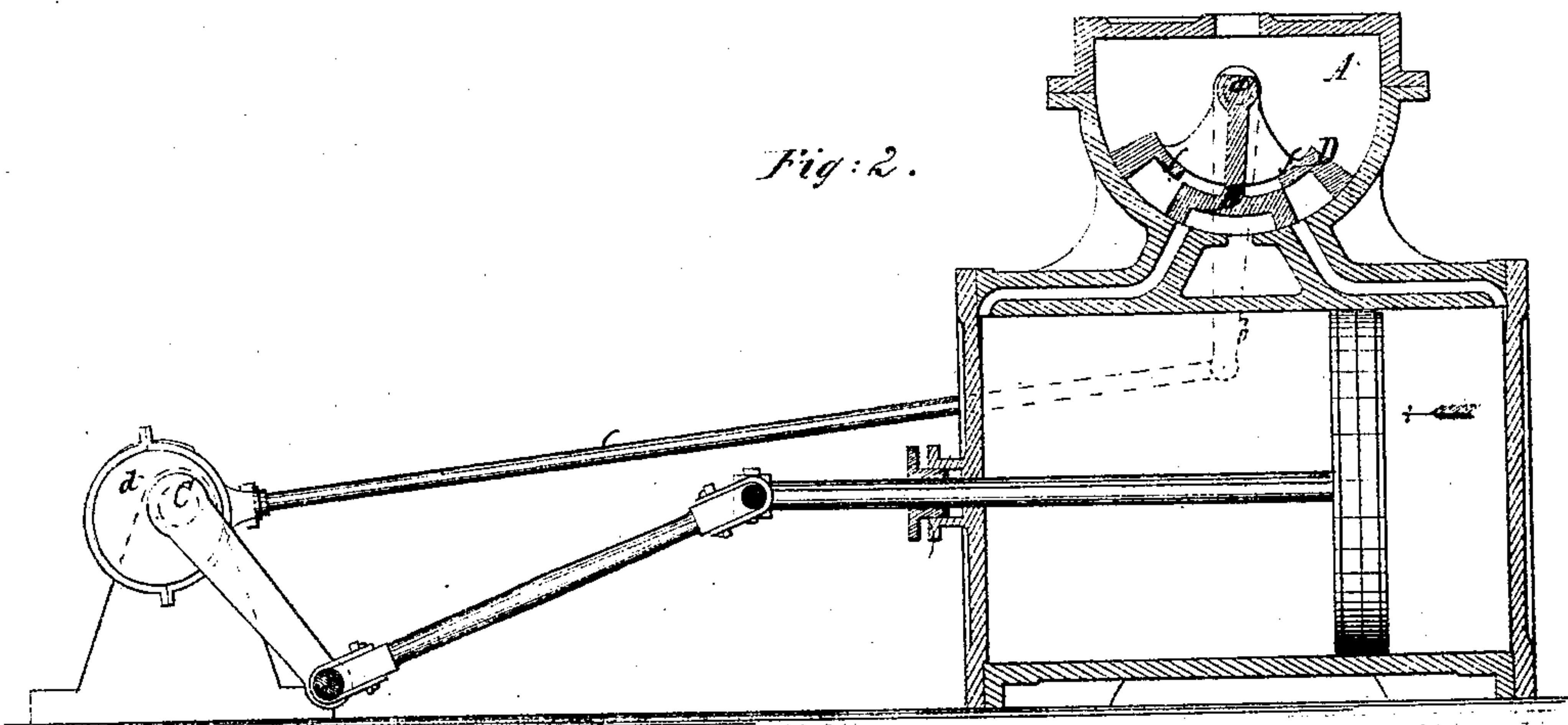
*No. 101,162.*

*Patented Mar. 22. 1870.*

*Fig: 1.*



*Fig: 2.*



*Witnesses.*

*6 Mahlers*  
*E. F. Kastner*

*Inventor.*

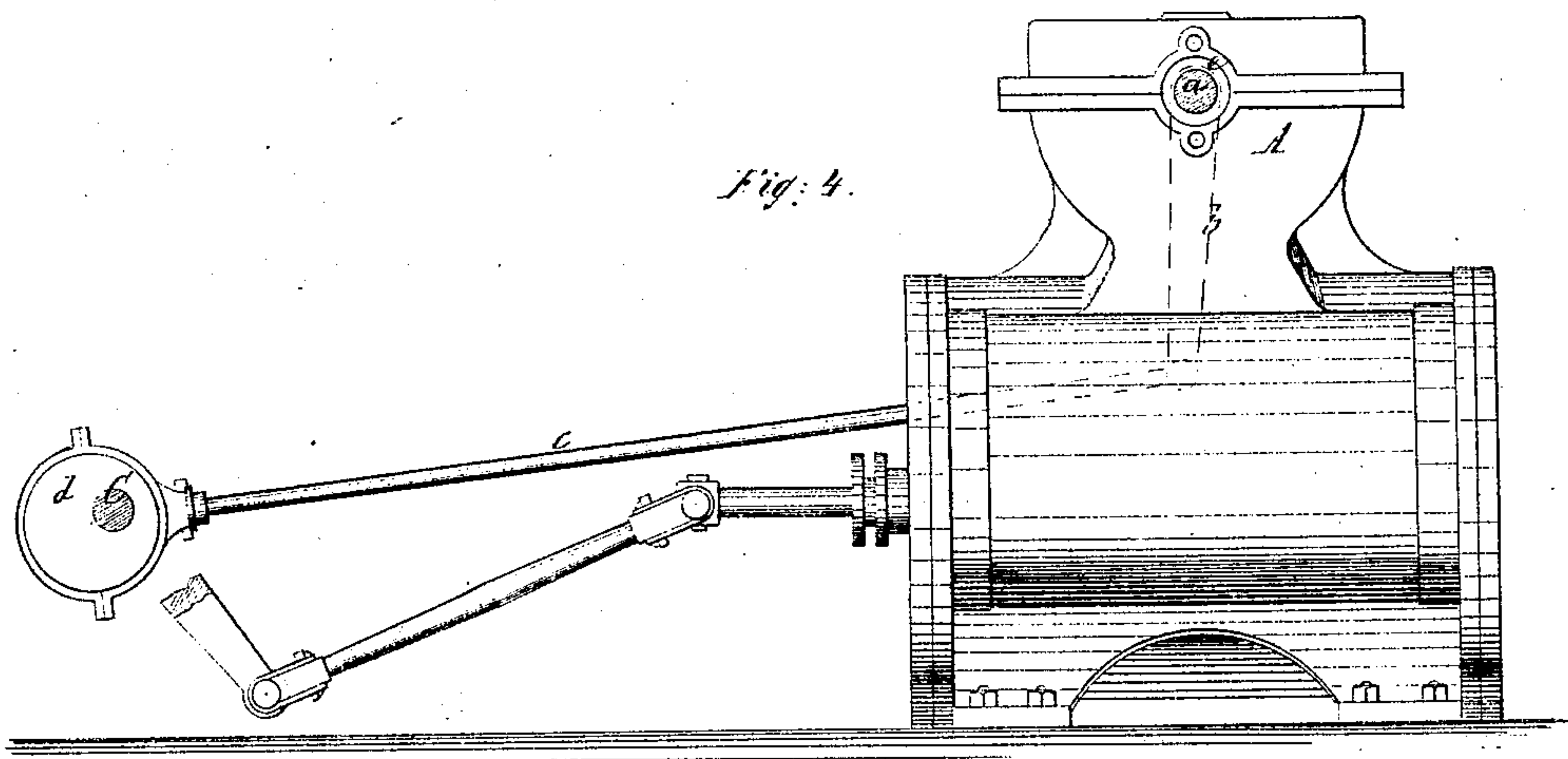
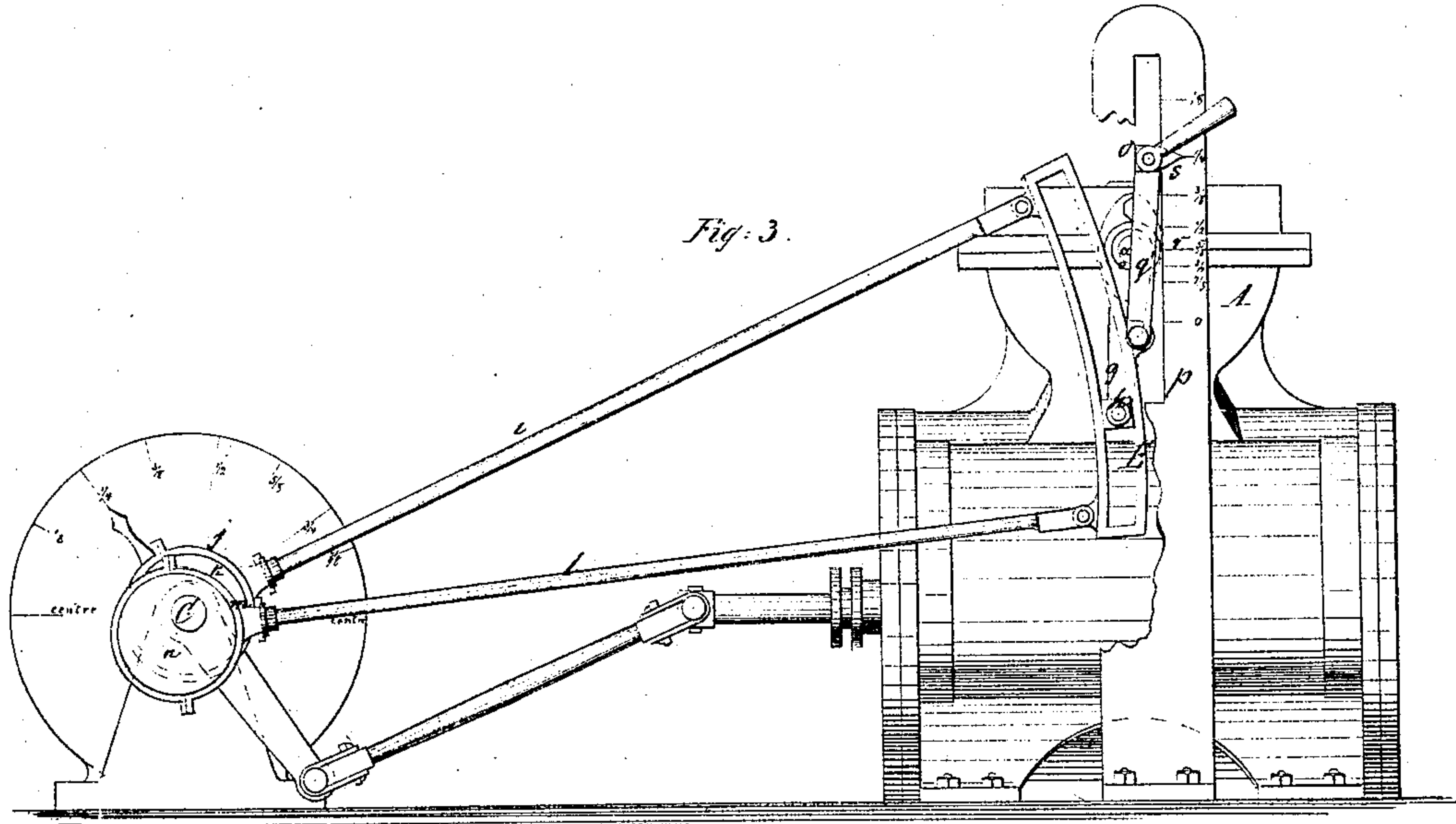
*Joseph Randles*  
*per*  
*Van Santvoord & Haupt*  
*attys*

*J. Randles,*  
*Cut-Off Valve.*

*2. Sheets, Sheet 2.*

*No. 101,162.*

*Patented Mar. 22, 1870.*



*Witnesses.*  
*L. Mahlers*  
*E. F. Kautenhuber*

*Inventor.*  
*Joseph Randles*  
*per*  
*Van Santvoord & Haupt.*  
*attys*



# United States Patent Office.

JOSEPH RANGLES, OF JERSEY CITY, NEW JERSEY.

Letters Patent No. 101,162, dated March 22, 1870.

## IMPROVED VARIABLE CUT-OFF.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, JOSEPH RANGLES, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and improved Variable Cut-off for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a plan or top view of this invention.

Figure 2 is a longitudinal vertical section of the same.

Figure 3 is a side elevation of the same, showing the motion of the cut-off valve.

Figure 4 is a similar view, showing the motion of the main valve.

Similar letters indicate corresponding parts.

This invention relates to a cut-off valve, which works on the same semicircular seat with the main valve, and which is so constructed that its ends will overlap the main valve, motion being imparted to it by means of a link, one end of which connects to a concentric disk, and the other to an eccentric mounted on the crank-shaft of the engine, in such a manner that by adjusting the link up or down, the cut-off valve can be made to move quicker than the main valve, or slower, or it can be made to remain stationary during the whole stroke of the piston, and by these means the steam can be cut off at any part of the stroke, and the cut-off can be adjusted while the engine is in motion.

In the drawing, the letter A designates the valve-chest, the bottom of which is semicircular, and forms the seat for the main valve B.

This valve is mounted on a spindle, *a*, which has its bearings in the sides of the valve-chest, and connects by a lever, *b*, and rod *c*, with an eccentric, *d*, mounted on the crank-shaft C of the engine.

The spindle *a* of the main valve passes through the hollow spindle *e* of the cut-off valve D, which works on the same seat with the main valve, and is provided with two lips *f*, (see fig. 2,) which overlap the main valve, and serve to cut off the steam, as will be presently explained.

On the end of the hollow spindle *e* is mounted a lever, *g*, to the end of which is secured a head, *h*, that forms the guide for the slotted link E, (best seen in fig. 3.) This link connects at one end by means of a rod, *i*, with a strap, *j*, embracing a concentric disk, *k*,

which is mounted on the crank-shaft C, while the opposite end of said link connects by a rod, *l*, with a strap, *m*, which embraces an eccentric, *n*, mounted on the crank-shaft. By this arrangement the link is rendered steady, and at the same time left free to be raised or lowered. This purpose of raising and lowering the link is effected by means of a slide, *o*, which moves in a slotted standard, *p*, rising from the bed of the engine, and which connects with the link by a rod, *q*.

On the standard *p* is marked a scale, *r*, divided off into eighths or tenths, or any desirable fractions, and an index, *s*, secured in the slide *o*, points to the marks of the scale *r*.

In practice, the slide *o* will be operated by a hand-lever, and it is held in the required position by a clamping-nut, or by any other suitable locking mechanism.

If the index *s* is set to one quarter, the cut-off valve moves quicker than the main valve, and one of the lips, *f*, begins to overlap the edge of the main valve when the piston has completed one quarter of its stroke, (see fig. 2.)

If the index is set to one half on the scale *r*, steam is cut off at half stroke, and so on, the cut-off valve moving slower and slower, until, when the index is set to the naught on the scale, the cut-off valve remains stationary, and steam is admitted to the cylinder throughout the whole stroke of the piston.

By this arrangement a cut-off is obtained which is simple in its construction, and which can be readily adjusted while the engine is in motion.

The valves being seated on semi-circular seats, and suspended from a spindle, can be readily so adjusted that they do not create any undue friction on their seats, and that they can be moved with comparatively little power.

What I claim as new, and desire to secure by Letters Patent, is—

The cut-off valve D, provided with lips *f*, and attached to a link, E, which is connected at one end to a concentric disk, *k*, and at its opposite end to an eccentric, *n*, and suspended from a slide, *o*, in combination with the main valve B, constructed and operating substantially in the manner herein shown and described.

JOSEPH RANGLES.

Witnesses:

W. HAUFF,  
C. WAHLERS.