

S. P. RUGGLES.

Crank and Piston Connections for Steam-Engines.

No. 157,765.

Patented Dec. 15, 1874.

Fig. 1.

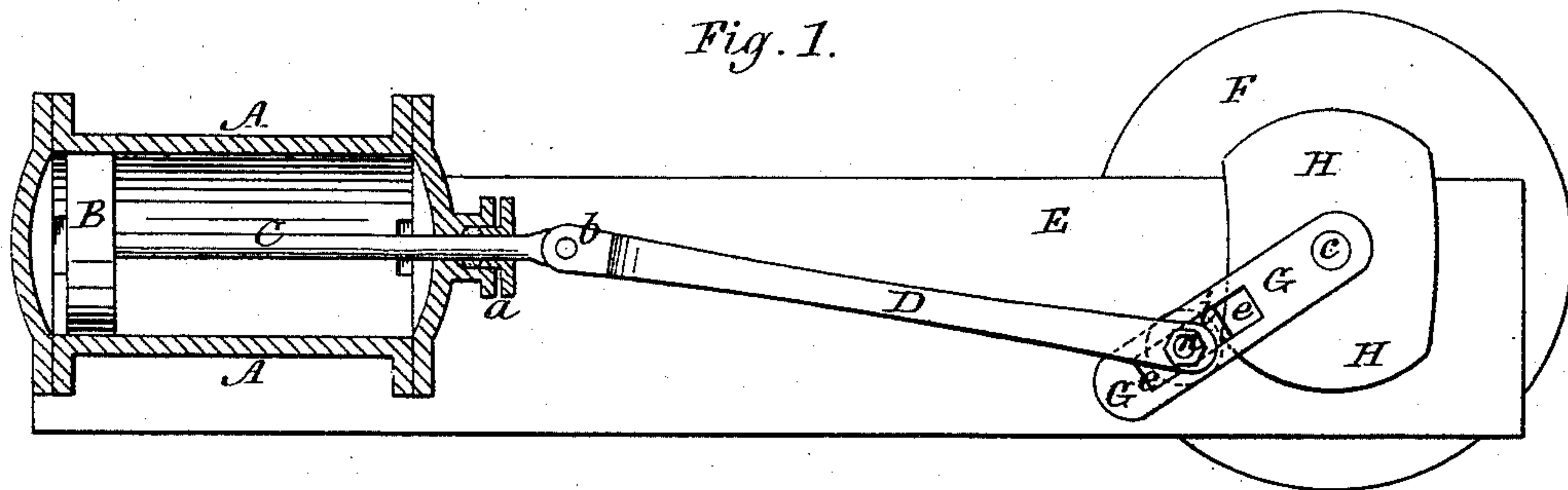
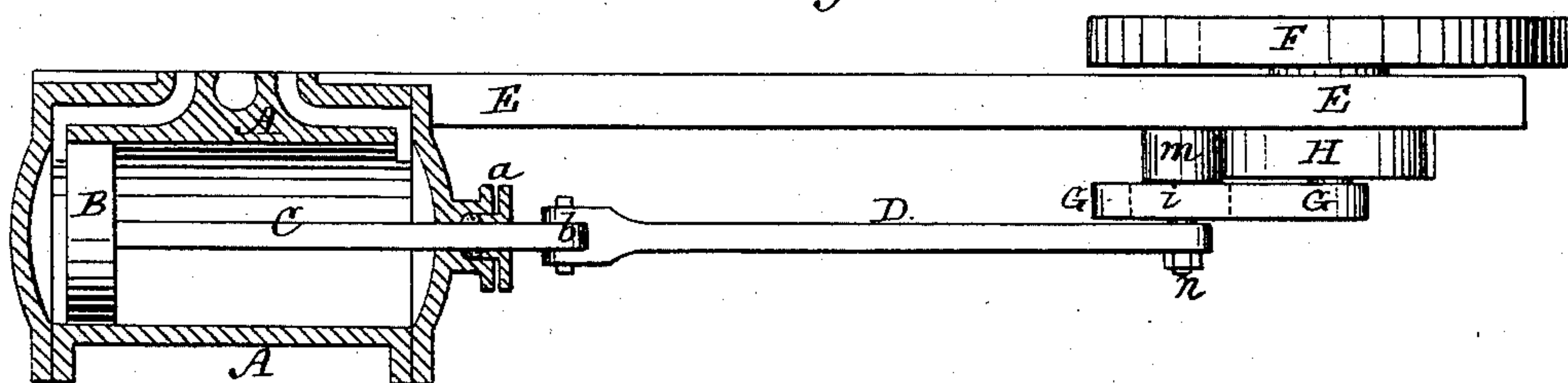


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE

STEPHEN P. RUGGLES, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN CRANK AND PISTON CONNECTIONS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **157,765**, dated December 15, 1874; application filed November 27, 1874.

To all whom it may concern:

Be it known that I, STEPHEN P. RUGGLES, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Crank and Piston or Pitman Connections for Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 represents a plan, and Fig. 2 a top view, of so much of a horizontal steam-engine as will illustrate my invention.

The object of my invention is to relieve the balance-wheel shaft of a steam-engine of the strain and pressure there is upon it when the crank is passing the dead-centers and the steam first let in at either end of the cylinder, and this I accomplish by using comparatively a long crank—much longer than half of the stroke of the piston—and getting a longer leverage on the crank out of the dead-center line at the time that the steam is first let into the cylinder; and my invention consists in a longitudinal or radial slot in the crank, in which a slide or block carrying the wrist-pin can traverse, said slide or block being guided in its movements by a friction-roll running against a cam or guide to elongate the crank during the working portions of its rotation, and shorten it to pass the dead-centers, as will be explained.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings, first premising that an arrangement of oblique slot in a crank, with a pin moving therein, without a guide of any kind, has been essayed in connection with a steam-engine, but for what useful purpose I am unable to say. To such an arrangement I make no claim whatever.

In the drawings, A represents a steam-cylinder having the usual inlet and exhaust ports. In this cylinder is the piston-head B, to which the piston-rod C is attached, the latter passing out through a stuffing-box, *a*, in

the usual well-known way. To the piston-rod C there is pivoted, as at *b*, the connecting-rod or pitman D. On one end of a shaft, *e*, supported in suitable bearings in the bed-piece E, is placed the balance-wheel F, and upon the opposite end of said shaft is placed the crank G, and between the crank and bed-piece is placed a cam or guide, H. In the crank-arm G there is a longitudinal slot, *e*, in which a block, *i*, is placed or fitted, so that it can freely traverse through said slot, and in or on this block there is a wrist-pin, *n*, to which the end of the connecting-rod or pitman D is attached. On or in the block *i* there is also a friction-roll, *m*, which is held and runs against the cam or guide H by the action of the steam, and moves said block and pin in the slot *e* of the crank-arm, lengthening or shortening the crank, as the case may be.

The wrist-pin *n* and the head or friction roll *m* may be in one piece, and turn in the slide or block *i*, while, of course, it always moves with the slide longitudinally of the crank.

It will be perceived, on reference to Fig. 1, that when the piston is ready to start, on admitting steam behind it, the crank has been elongated, and the connecting-rod and wrist-pin have passed so far beyond the line of dead-centers that the power of the steam is economically applied to turning the crank and balance-wheel, and does not come against the bearings of the balance-wheel shaft, as would be the case with the common crank, or short crank, such as are commonly used.

Having thus fully described my invention, what I claim is—

In combination with the piston of a steam-engine and its rod-connection with the crank, the slot in said crank and slide or block therein, having connected to or with it the wrist-pin and head or roll, and the stationary guide or cam, as and for the purpose described and represented.

STEPHEN P. RUGGLES.

Witnesses:

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