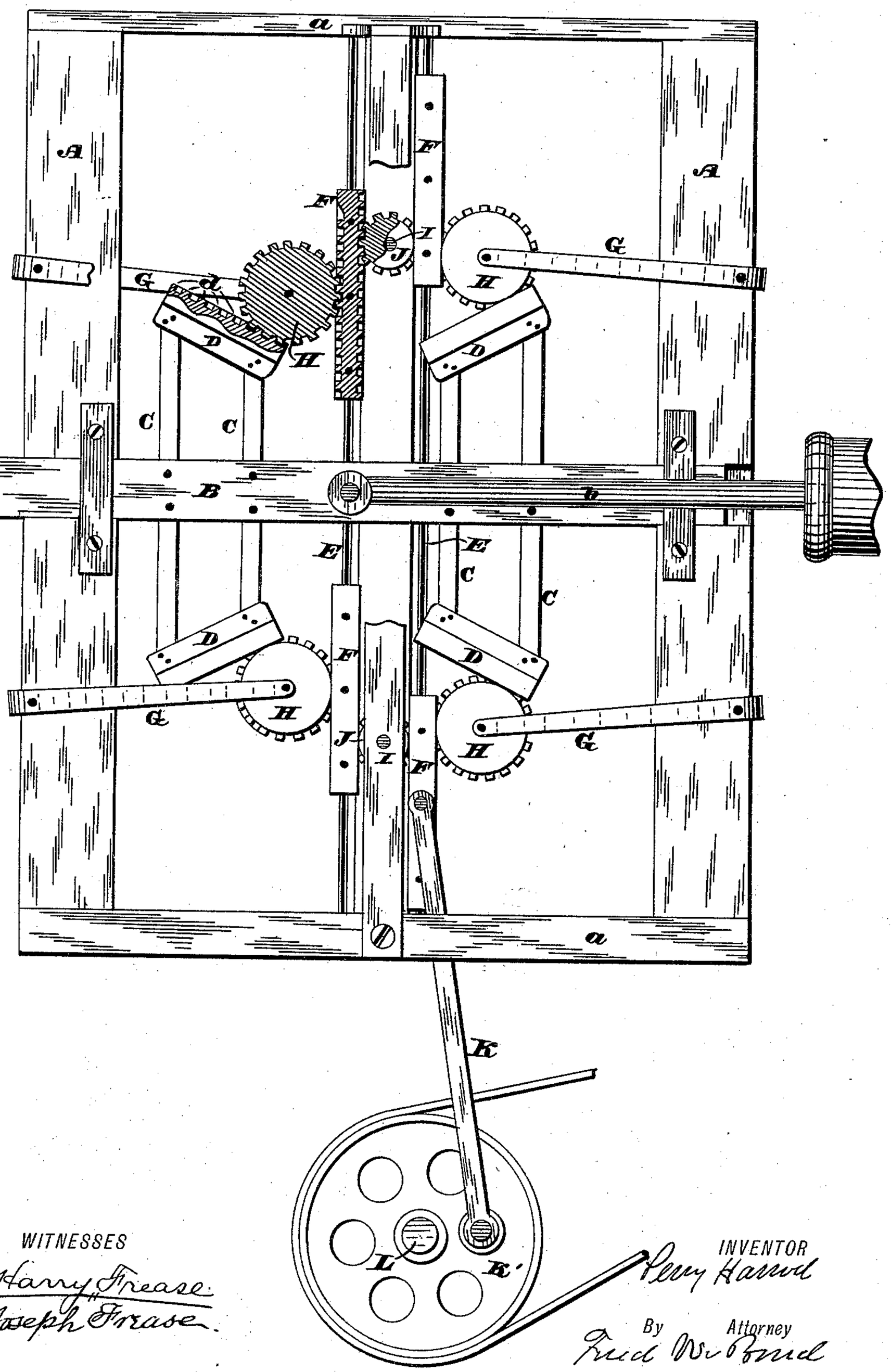
(No Model.)

P. HARROD.

DEVICE FOR GAINING LEVERAGE.

No. 334,771. Patented Jan. 26, 1886.



WITNESSES

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DEVICE FOR GAINING LEVERAGE.

SPECIFICATION forming part of Letters Patent No. 334,771, dated January 26, 1886.

Application filed November 21, 1885. Serial No. 183,578. (No model.)

To all whom it may concern:

Be it known that I, PERRY HARROD, a citizen of the United States, residing at West Warsaw, in the county of Allen and State of Ohio, have invented certain new and useful Improvements in Devices for Gaining Leverage; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, making a part of this specification, and to the letters and figures of reference marked thereon, in which the drawing represents a side elevation showing my device partly in section.

The present invention has relation to devices designed and calculated to increase the leverage of steam-engines and other motors; and its nature consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

In the accompanying drawing, A represents the upright posts or standards, which may be located substantially as shown. These posts or standards are securely held in proper position by means of suitable cross-bars, *a*, said cross-bars and posts or standards A being securely attached together by suitable clamping-bolts, or in any other well-known manner. These posts or standards A and the cross-bars *a* form or compose the frame proper, and for the purpose of holding the frame rigid and strengthening the same suitable braces may be properly attached at the corners or angles of the frame proper.

The sliding or reciprocating bar or rod B may be substantially of the form shown in the drawing, and may be located substantially as shown. This sliding or reciprocating bar or rod B is held in proper position by means of grooves or recesses cut or formed in the posts or standards A, said grooves or recesses forming suitable bearings for the movements of said bar or rod B.

The piston-rod *b* may be attached to the sliding or reciprocating bar or rod B, as shown in the drawing, suitable slides or guides being provided for the movements of said piston-rod *b*.

It will be seen that the piston-rod *b* may be dispensed with, and the reciprocating bar or rod B be continued, and the continuation be used in place of the piston-rod *b;* but I prefer to use said piston-rod *b*, and adjust the same substantially as shown in the drawing.

It will be understood that in case it is desired to apply my invention to a steam-engine two steam-cylinders may be used, one cylinder being located at each end of the sliding or reciprocating bar or rod B, and the parts connected to the cylinders duplicated. In the accompanying drawing but one steam-cylinder is shown.

To the sliding or reciprocating bar or rod B are securely attached the bars or arms C, which may be located and adjusted substantially as shown in the drawing.

In the drawing four bars or arms C are shown; but it will be seen that two wide bars or arms will answer the same purpose as the four narrow bars or arms shown in the drawing.

To the top or upper and the bottom or lower ends of the bars or arms C are securely attached by suitable clamping-bolts or otherwise the inclined blocks or bars D, which may be substantially of the form shown in the drawing, and, as shown, are each provided with cogs or teeth *d*, which are for the purpose hereinafter described.

To the frame proper are attached in any well-known manner the guide rods or bars E, which are for the purpose of assisting in holding in proper position the reciprocating cogged or toothed reciprocating bars or blocks F, being held on said guide bars or rods E by means of suitable staples or equivalent devices.

To the posts or standards A are pivoted or bolted the vibrating or swinging bars or arms G, said bars or arms G being located and adjusted substantially as shown in the drawing, and to the free ends of these bars or arms G are properly attached and adjusted the cog-wheels H, and are so arranged that each wheel will mesh into one of the inclined bars or blocks D, and also into one of the reciprocating bars or blocks F, as shown in the drawing.

The shafts I are located in the frame proper substantially as shown in the drawing, and are each provided with suitable bearings.

To one end of each of the shafts I are properly attached and adjusted the cogged or toothed pinions J, said pinions being so arranged that they will mesh into the reciprocating bars or blocks F, as shown.

It will be seen that by my peculiar arrangement and adjustment as the sliding or reciprocating bar or rod B is moved back and forth it will carry with it the bars or arms C and the inclined bars or blocks D, and as said inclined bars or blocks D are provided with teeth or cogs they will cause the wheels H to rotate or rock, thereby causing the bars or blocks F to move up and down or back and forth, and at the same time will carry the reciprocating bars or blocks F the distance between the upper and lower points of the inclined bars or blocks D, which causes the reciprocating bars or blocks F to move the entire distance the wheels H travel on the inclined bars or blocks D, and also the distance between the upper and lower points of the limits of the movements of said wheels H upon said inclined bars or blocks D, thus producing a much longer vibration or movement of the reciprocating bars or blocks F than that of the sliding or reciprocating bar or rod B, the increased length of motion being gained on the principle of wedge power.

To one of the reciprocating bars or blocks F is properly attached the pitman K, the opposite end of said pitman being attached to the crank-pin K′, by means of which rotary motion is communicated to the shaft L, or, if desired, a compound crank may be provided and two pitmen used, one being attached to each of the lower reciprocating bars or blocks F, or, if desired, said pitman or pitmen may be attached to the top or upper reciprocating bars or blocks F.

It will be seen that by my peculiar arrangement I am enabled to increase the length of the stroke, thereby increasing the length of leverage and at the same time providing different places for attaching pitmen, and thereby changing reciprocating to rotary motion. It will be understood that my device may be placed in a horizontal position, if so desired.

It will be seen that segments may be used in place of the wheels H.

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

1. The sliding or reciprocating bar or rod B, provided with the bars C, said bars C being provided with inclined bars or blocks D and the teeth *d*, substantially as and for the purpose specified.

2. The combination, with the vibrating or swinging arms G, pivoted to the posts or standards A, of the wheels H, attached to the free ends of the arms G, and the reciprocating bars or blocks D and F, substantially as and for the purpose specified.

3. The combination, with the reciprocating bars or blocks F, of the wheels H, pivoted or bolted to the free ends of the vibrating or swinging arms G, and the pinions J, substantially as and for the purpose specified.

4. The combination, with the reciprocating bars or blocks F, of the pinions J and the shafts I, substantially as and for the purpose specified.

5. The inclined blocks or bars D, in combination with the wheels H and the vibrating or swinging arms G, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

PERRY HARROD.

Witnesses:
REBECCA RINEHART,
OTTO RINEHART.