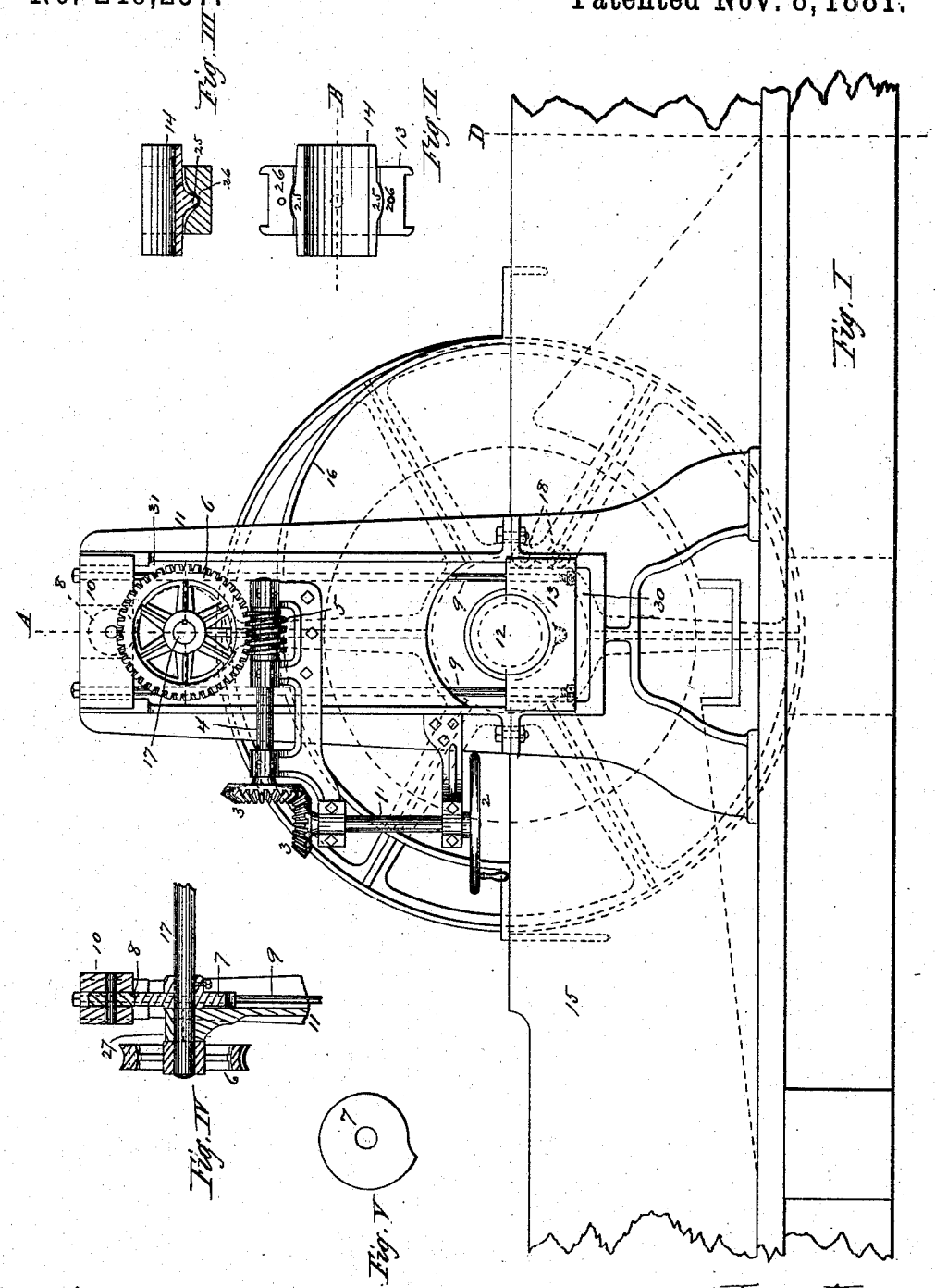
(No Model.)

2 Sheets—Sheet 1.

A. C. RICE.

RAG ENGINE.

No. 249,257. Patented Nov. 8, 1881.



Witnesses.
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Inventor.
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his Atty.

(No Model.)

2 Sheets—Sheet 2.

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Fig. III.

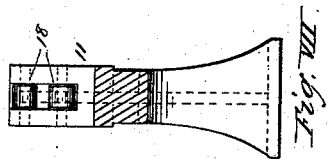
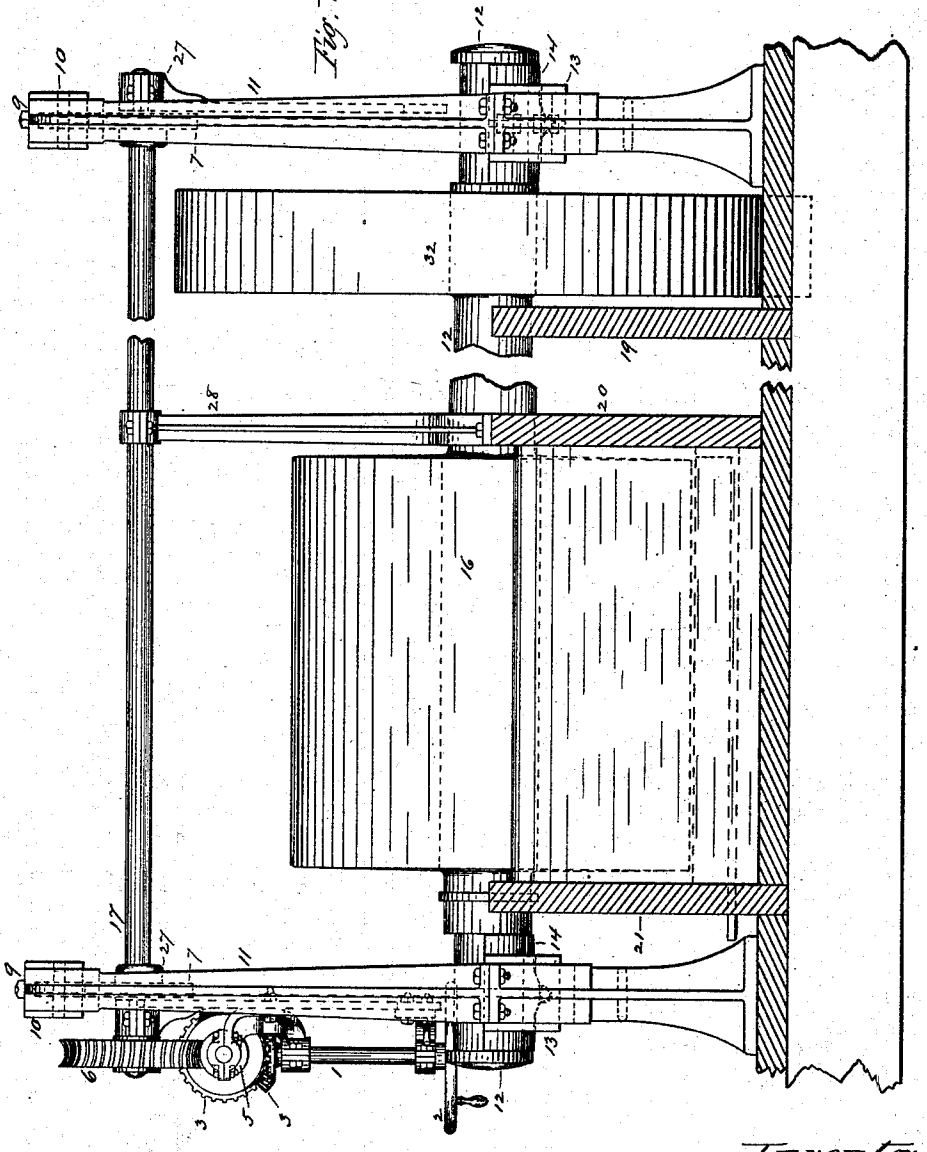


Fig. II.



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UNITED STATES PATENT OFFICE.

ALVA C. RICE, OF HOLYOKE, MASSACHUSETTS.

RAG-ENGINE.

SPECIFICATION forming part of Letters Patent No. 249,257, dated November 8, 1881.

Application filed August 17, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALVA C. RICE, of Holyoke, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Rag-Engines, of which the following is a specification and description.

The object of my invention is to construct a rag-engine so that the beating-cylinder may be easily adjusted vertically to any desired point of proximity to the fixed plates or knives beneath it and parallel thereto by the manipulation of a single shaft, and I accomplish this by the mechanism substantially as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure I is a side view of a rag-engine made according to my invention. Fig. II is a plan view of the bearing-block containing the journal-box in which the main shaft revolves. Fig. III is a vertical section of the same at line B. Fig. IV is a vertical section through the worm-pinion and operating or lifting cam at line A of Fig. I. Fig. V is a side view of the operating or lifting cam. Fig. VI is a transverse section through the vat, showing an end view of the engine; and Fig. VII is a vertical transverse section through one end of the frame, showing two small friction-rolls secured therein to take the side bearing of one of the bearing-blocks.

In the drawings, 11 represents the two uprights, forming a frame with a rectangular opening, as 30, in the lower portion of each, in which is fitted to slide vertically a block, as 13, provided with suitable guide-flanges to keep it in its proper vertical position, and a journal-box, as 14, is swiveled in each block, preferably by protuberances, as 25, resting in recesses, as 26, whereby the journal-box may adapt itself to any irregularity in the movement of the shaft independently of the block.

The middle portion of each upright 11 is preferably cast solid, and a shaft, as 17, has its bearings at the upper part of this solid portion of the frame, as shown at 27 in Figs. IV and VI, and this shaft may also have a bearing in the upper end of a steady-frame, as 28, at any desired point between the uprights 11.

A rectangular opening, as 31, is made in the upper end of each upright 11, and in each said opening is fitted to slide freely a block, as 10, similar in form to the lower block, 13, in which I pivot a roll, as 8, and I secure a cam, as 7—whose outline is shown in Fig. V—firmly to the shaft 17, at a point directly beneath each roll 8, with the periphery of the roll bearing upon the periphery of the cam.

The upper ends of two or more rods, as 9, are secured firmly in each upper block, 10, and these rods extend down and their lower ends are firmly secured to or in the block 13, as shown in Fig. I.

It will thus be seen that the upper and lower blocks in each upright are firmly and securely connected by the rods 9, and that both blocks in each upright are free to move in a vertical direction; but that the horizontal shaft 17 is arranged to revolve in fixed or stationary bearings in the uprights.

It will also be seen that as the lower block, 13, is suspended from the upper block, 10, and the latter or the roll 8 pivoted therein rests upon the cam 7 in each upright, and as these two cams, one beneath the block 10 in each upright, are fixed to the shaft 17 in a position coincident with each other, it is evident that if the shaft 17 and its cams 7 be revolved, the cams will operate to raise or lower both blocks 10 and 13 in each upright to precisely the same degree, or exactly the same distance, according as the shaft 17 is revolved in one direction or the other.

The main shaft 12 of the engine (the latter being of the ordinary construction) is hung or has its bearings at each end in the boxes 14, which rest upon or are swiveled in the blocks 13. The shaft 17 projects at one end through the upright 11, and upon this projecting end I firmly secure a worm pinion or gear, as 6; and in suitable bearings bolted to the upright at that end I secure a horizontal shaft, as 4, provided with a worm, as 5, to engage with said pinion or gear, said horizontal shaft 4 being connected by a bevel-gear, as 3, with a vertical shaft, as 1, provided with a hand wheel or winch, as 2, by which to turn it. By turning the hand-wheel in one direction the shaft 17, with the cams thereon, is made to revolve in one direction through the medium of the beveled and worm gears, and the cams 7, by rotating against the periphery of the rolls 8 in the blocks 10, operate to raise the latter, together with the lower blocks, 13, and with them the main shaft 12 and engine-cylinder thereon, and

by turning the hand-wheel in the opposite direction the cylinder, with the shaft 12, is lowered. The cylinder being provided with knives which revolve past stationary knives or plates fixed in the bed beneath the cylinder, it is evident that by this device for raising or lowering the cylinder the knives at each end of the cylinder will be moved farther from or nearer to the fixed knives, precisely alike, and the cylinder will always remain perfectly parallel with the bed, whether in a more or less elevated position. It is also evident that this operation of elevating or depressing the cylinder may be performed much more quickly than by the use of the ordinary winch at each end of the shaft, or on each side of the vat, and much more accurately than by such use of two winches, and the adjustment of the cylinder to the stationary knives may be made absolutely parallel and perfect, and very easily.

As the belt which is connected with the pulley 32 to drive the main shaft 12 and the cylinder usually runs from a driving pulley and shaft at nearly the same height, and would naturally draw the shaft 12 and the block 13, which supports the shaft, against the inside of the frame in a lateral direction, I pivot two friction-rolls, as 18, into the frame in such manner that the periphery of the rolls may just be flush with the bearing end of the block 13 in that end of the frame nearest the pulley 32, as shown in Fig. VIII and in dotted lines in Figs. I and VI, so that the end of the block may bear against said rolls in moving up or down, and much of the friction be removed thereby.

It is evident that the single horizontal shaft 17, which I denominate the "operating-shaft," may be rotated by any other suitable and equivalent mechanism of sufficient power, which will cause the two cams, one in each frame or upright 11, to revolve with the same speed and to the same extent, to raise or depress each block 10 simultaneously and the same distance.

The machine would be operative if the main shaft 12 rested in suitable bearings made in the upper side of the blocks 13; but I prefer to use the self-adjusting boxes, as they will adjust themselves to the shaft if the blocks should bind in the frame in their movement therein.

Having thus described my invention, what I claim as new is—

1. In a rag-engine, the combination, with the supporting-frame, of an operating-shaft having its bearings in said frame, two operating-cams secured to said shaft, one at each end, two blocks adapted to move vertically in each end of said frame, one above each cam and supported thereby, and one below each cam, and both blocks rigidly connected by suitable rods or connecting medium, and the lower blocks adapted for the bearings of the main shaft to which the rag-cylinder is secured, whereby the main shaft and cylinder may be adjusted vertically with reference to the bed beneath by the rotation of said operating-shaft and cams, substantially as described.

2. In a rag-engine, the combination, with the supporting-frame, of two bearing-blocks adapted to have a free vertical movement, one in each end of the frame, and each supported by a vertically-movable block resting upon a cam secured to the operating-shaft, and a self-adjusting journal-box swiveled in each bearing-block for the bearing of the main shaft, substantially as described.

3. In a rag-engine, the combination, with the supporting-frame, of two bearing-blocks adapted to receive the main cylinder-shaft and to have a free vertical movement, one in each end of the frame, an operating-shaft having its bearings in said frame and provided with cams supporting and adapted to operate two blocks above said cams rigidly connected with said bearing-blocks, a gear or toothed wheel secured to said operating-shaft, and a screw or worm adapted to be operated in suitable bearings and engaging with said gear or toothed wheel, whereby said operating-shaft is rotated in either direction to raise or depress said bearing-blocks and the main cylinder-shaft resting therein, substantially as described.

ALVA C. RICE.

Witnesses:
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