No. 762,469. PATENTED JUNE 14, 1904.

G. M. CURRAN.

MACHINE FOR GRINDING THE PACKING RINGS AND SLIDE VALVES IN AIR BRAKE TRIPLES AND ENGINEERS' VALVES.

APPLICATION FILED JULY 6, 1903.

NO MODEL.

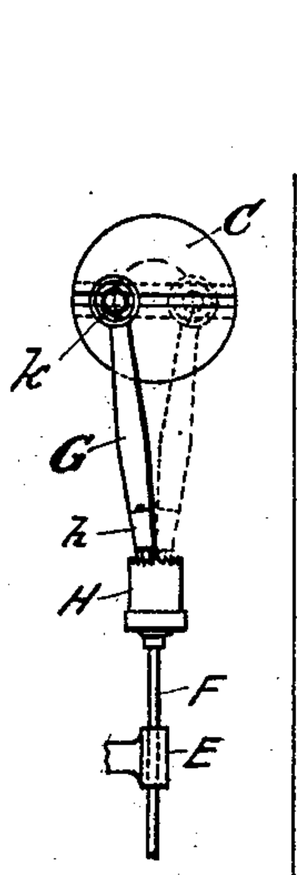

Fig. 4

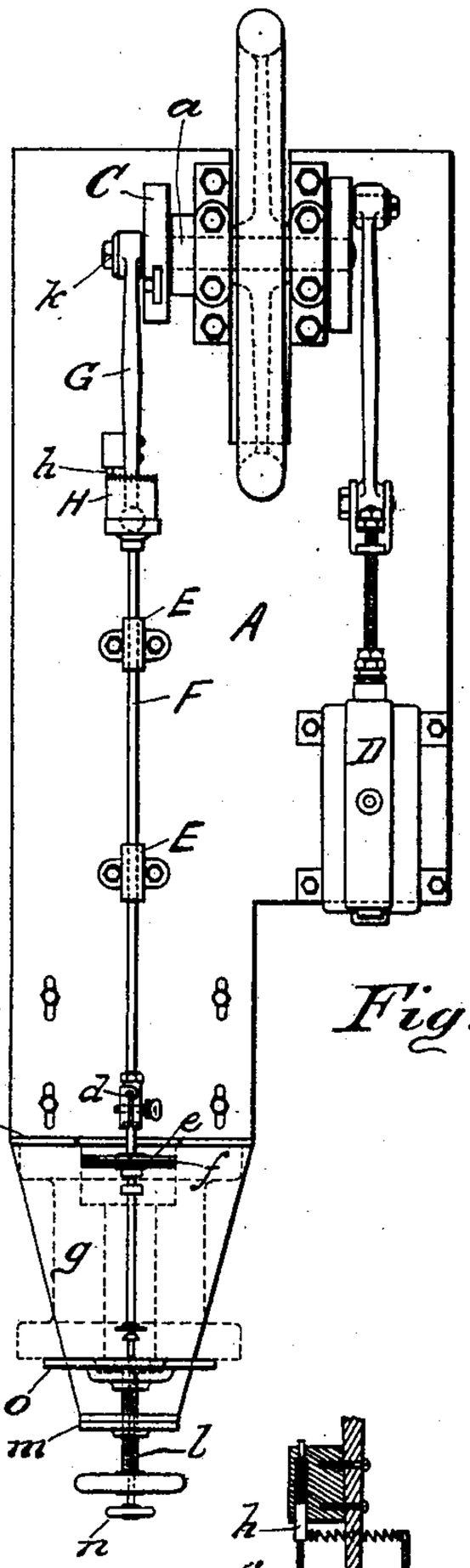

Fig. 1.

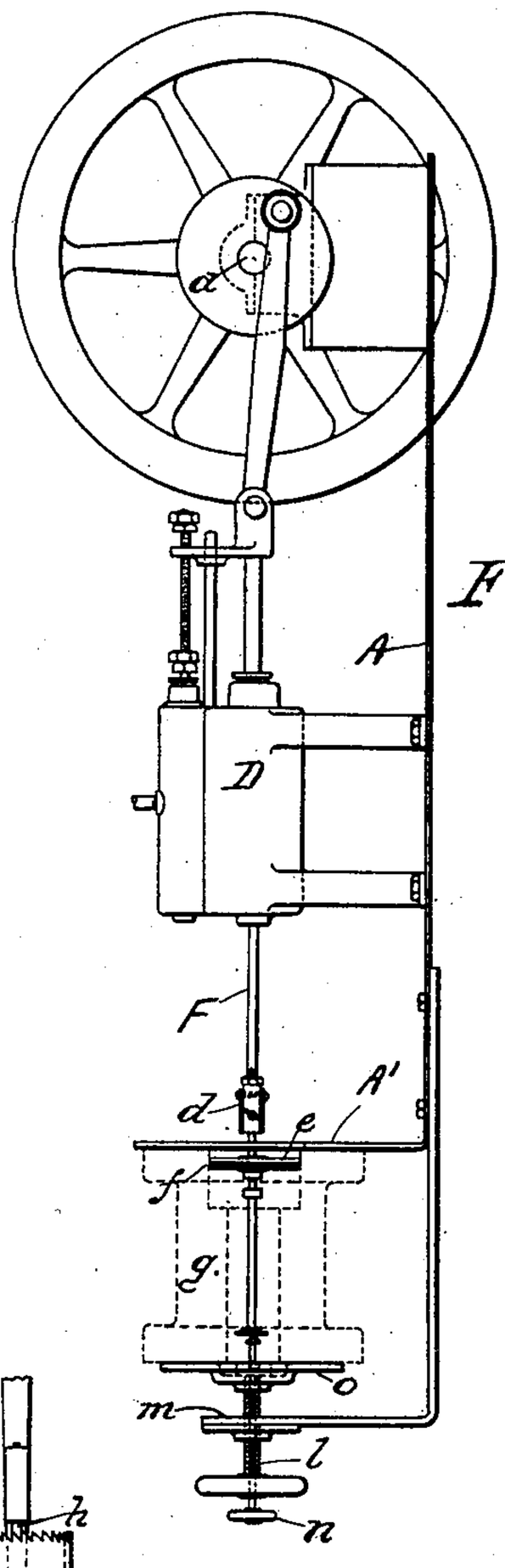

Fig. 2.

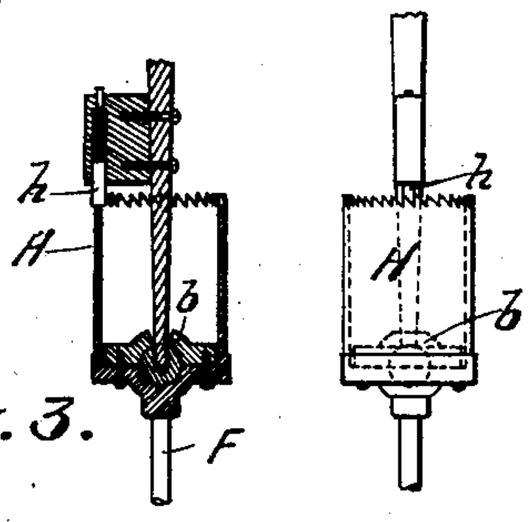

Fig. 3.

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No. 762,469. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

GEORGE M. CURRAN, OF MIDDLETOWN, NEW YORK.

MACHINE FOR GRINDING THE PACKING-RINGS AND SLIDE-VALVES IN AIR-BRAKE TRIPLES AND ENGINEERS' VALVES.

SPECIFICATION forming part of Letters Patent No. 762,469, dated June 14, 1904.

Application filed July 6, 1903. Serial No. 164,375. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. CURRAN, of the city of Middletown, county of Orange, in the State of New York, have invented new and useful Improvements in Machines for Grinding the Packing-Rings and Slide-Valves in Air-Brake Triples and Engineers' Valves; and I do hereby declare the following to be a full, clear, and exact description thereof, which, together with the accompanying drawings, will enable others skilled in the art to make the same.

The process of grinding the piston-rings and the slide-valve of an air-brake triple has heretofore been accomplished by moving them vertically by manual labor while in their respective positions in the triple-body, using nothing but oil in the operation. Consequently the art has been very slow and tedious and required the services of an experienced mechanic from one (1) to eight (8) hours on each triple. When the triple has been placed in the machine and the valve attached to spindle, the grinding is done automatically without further attention from the operator.

My invention relates to the class of machines wherein a spindle is vertically reciprocated and revolved horizontally at same time, the parts to be ground being attached to the lower end of the said spindle, the whole being attached to a frame and operated by a motor.

Referring to the accompanying drawings, Figure 1 represents a front elevation; Fig. 2, a side elevation of the motor; Fig. 3, a detached and enlarged view of connecting-rod and revolving mechanism; Fig. 4, a side view of connecting-rod and revolving mechanism.

Similar letters refer to similar parts through the several views.

An iron plate or casting A is secured to a post or to the side of a building in a perpendicular position and forms the frame or bed of machine. Attached to the frame A is a motor D for driving the shaft *a*, on which is located a disk C. The bearings E (in which slides and turns a vertical spindle F) are also secured to the frame A.

The shaft *a* can be operated by a pulley and the power furnished from a revolving shaft by a belt; but on the drawings is shown a compressed-air motor D, which is found preferable for this purpose, but no claim is made thereon.

The desired length of the stroke of the vertical spindle F is attained by an adjustable crank-pin *k*, secured to the slotted disk C by a nut in the ordinary manner.

The upper end of connecting-rod G is provided with a bearing for the crank-pin, and the lower end is connected to the spindle F by a ball-and-socket joint. The ball is screwed to the lower end of connecting-rod G after the cap *b* has been passed over the threads of screw. The socket is formed in the bottom of a hollow cylinder H (shown in detail in Fig. 3) and can be made in one piece with spindle F.

The ball-and-socket joint is held together by screws from the under side of the cylinder H.

The lower end of spindle F is furnished with a grip or clamp *d*, by which are held the triple-valve piston *e*, with the packing-rings *f* in the grooves provided for them. The position of the body of triple *g* is shown in dotted lines. As the spindle F moves vertically the packing-rings *f* are carried with it, and the friction of the rings against the bushing of triple-body *g* wears them to a perfect fit. The packing-rings are composed of spring-brass and adjust themselves to the inside of the triple-body.

The revolving motion of the spindle F is attained by the use of a pawl *h*, working in a series of teeth in the upper rim of the cylinder H, the motion being procured from the oscillation of the connecting-rod G, as shown in Fig. 4, to which the pawl is secured. Each revolution of the crank *k* causes the pawl to move forward and back one or more teeth, (the distance being determined by the

height of the pawl above the ball-joint,) thus slowly revolving the cylinder H and spindle F, of which it forms a part. The piston packing-rings are thus revolved while making their vertical stroke, and any inaccuracies in the rings *f* or the bushing in triple-body *g* are ground to a uniform diameter.

In an air-brake triple the piston packing-rings and the slide-valve are both attached to the same piston; but in grinding the slide-valve the packing-rings are removed. The pawl *h* is also to be held up from the teeth of the cylinder and the revolving motion dispensed with while grinding the slide-valve. This can be done with a screw or any other known device.

A special spindle for grinding slide-valves is desirable, so that there shall be no end movement of the valve on the spindle while being ground. To securely hold the triple-body *g* while being ground, it is forced upward against a projection of the plate A (exactly at right angles with the spindle F) by a screw *l*, which passes through the foot *m* or lower part of machine, which is threaded for the screw. The disk *o* on the top of screw *l* is recessed out to fit a projection on the lower part of triple-body, whereby it is readily centered. The projection of frame A′ is cut out to allow for the passage of the spindle F and piston *e*. Screw *l* has a hole through its entire length, in which is placed a light rod with a button-head on top to keep it from dropping out and a knob or handle *n* on the lower end. Should the piston fit tightly, it can be raised by pushing upward on the knob.

The spindle F of machine is operated at a high speed, and five minutes grinding usually furnishes a perfect fit to the triple-valve bushing and the packing-rings or to the slide-valve and its seat.

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

1. In a piston-grinding machine, a frame, a shaft, bearings on the frame for the shaft, a longitudinally-movable spindle and in combination a crank, a connecting-rod, a spindle, a clamp at the lower end of the spindle, a cylinder having teeth and means engaging the teeth for rotating the cylinder.

2. In a piston-ring-grinding machine, a frame, a shaft, journaled on the frame, a spindle, a right-angle projection, a foot attached thereto, a connecting-rod for the spindle, a crank for operating the connecting-rod, a cylinder having teeth and means engaging the teeth for rotating the cylinder.

3. A piston-grinding machine composed of a spindle F having a vertical and revolving movement, and a universal joint at its upper end, in combination with the hollow cylinder H having a serrated or toothed rim, a pawl *h* attached to connecting-rod G and operated by the oscillating motion, a crank *k*, a shaft *a*, and a frame A substantially as described.

4. In a piston-grinding machine, a spindle having a longitudinal and rotatable movement, a clamp for the spindle, a connection-rod for the spindle, a cylinder, a pawl engaging the cylinder and a crank and shaft, for operating the spindle, substantially as described.

5. Piston-ring-grinding machine, having a revolving and vertically-moved spindle F in combination with the universal joint *b* and clamp *d*, and a frame A provided with a projecting table A, as and for the purposes specified.

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Witnesses:
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