

E. Andrews, *Grinding Saws.*

Nº 81,126.

Patented Aug. 18, 1868.

Fig: 1.

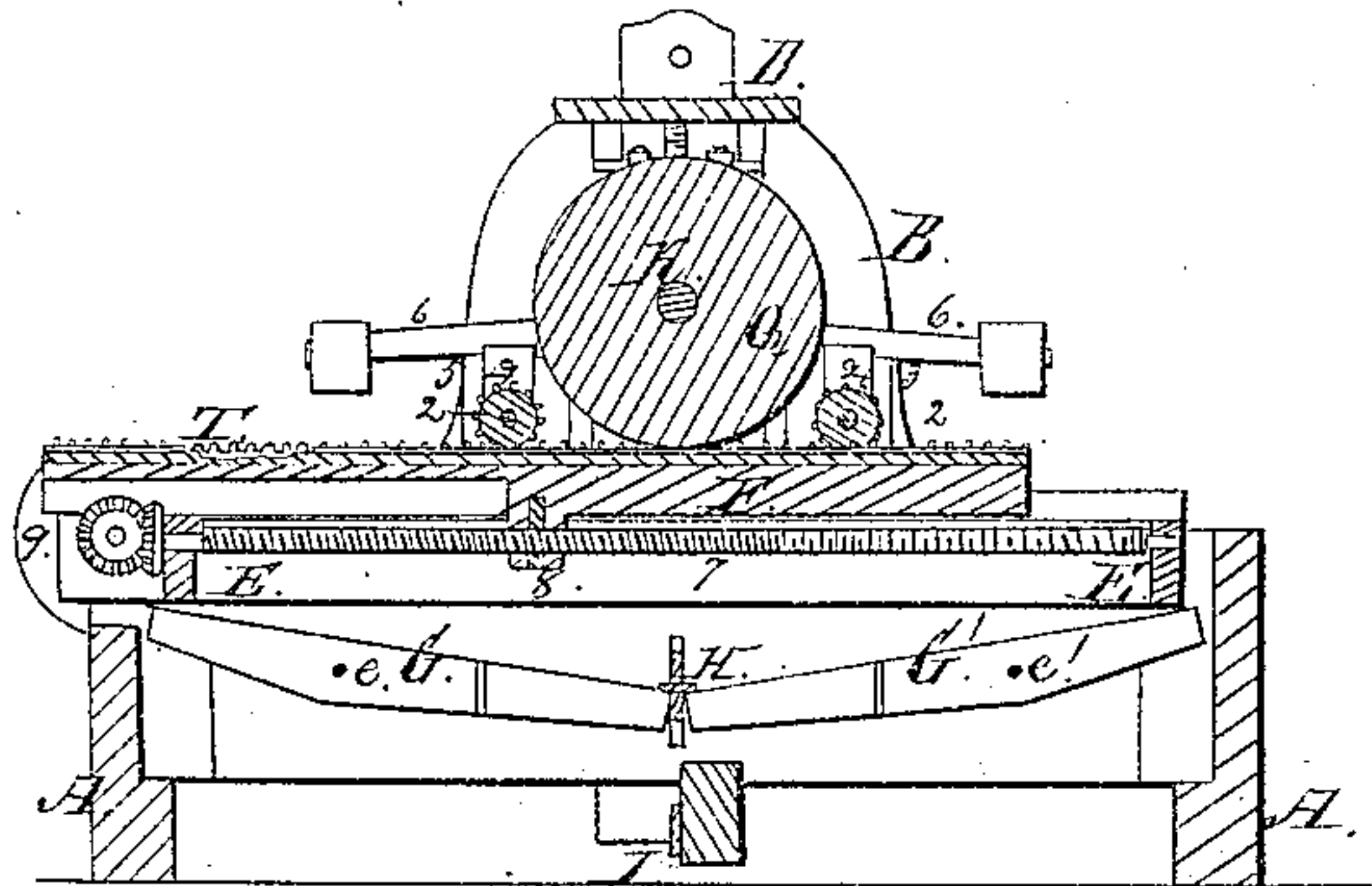


Fig: 2.

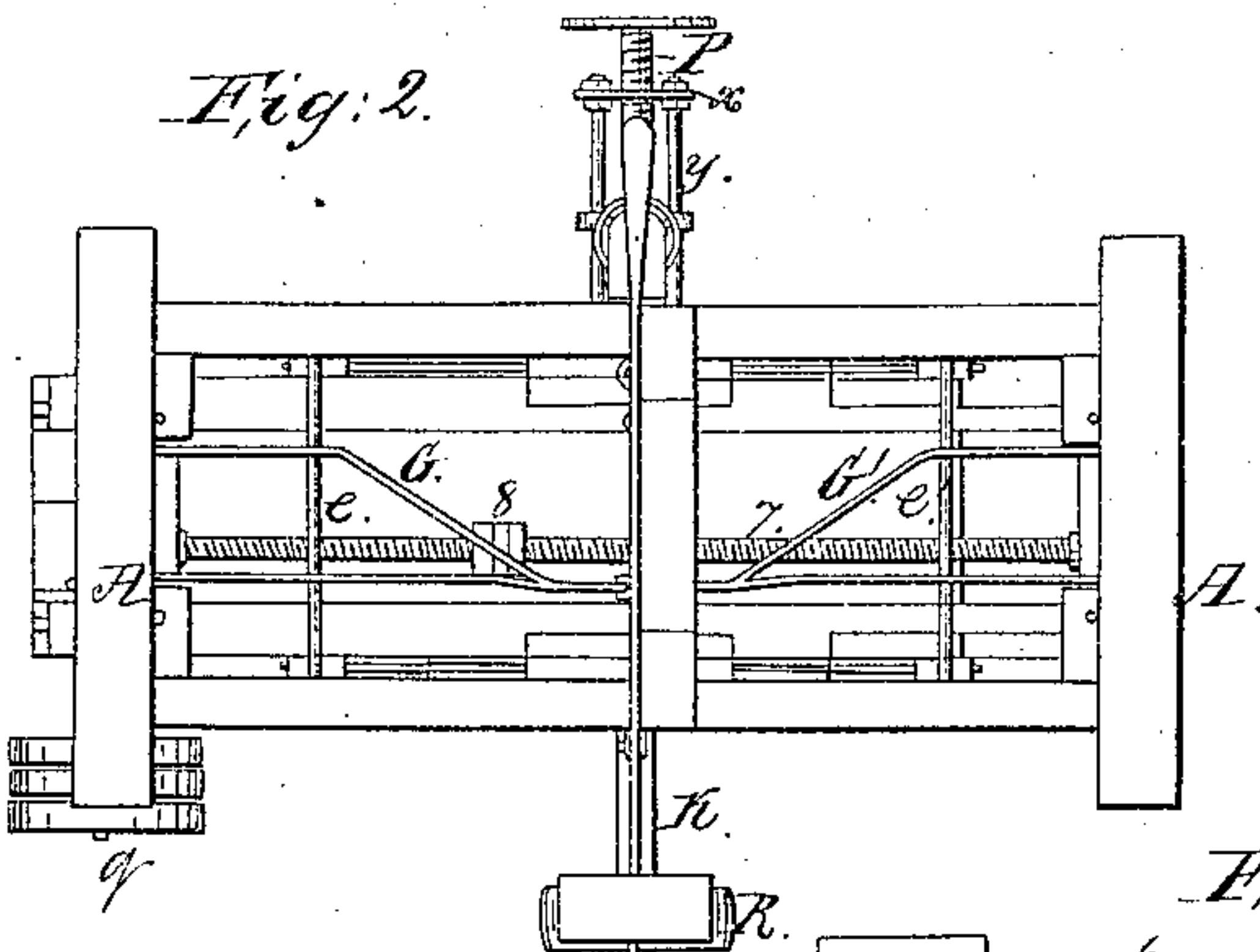


Fig: 4.

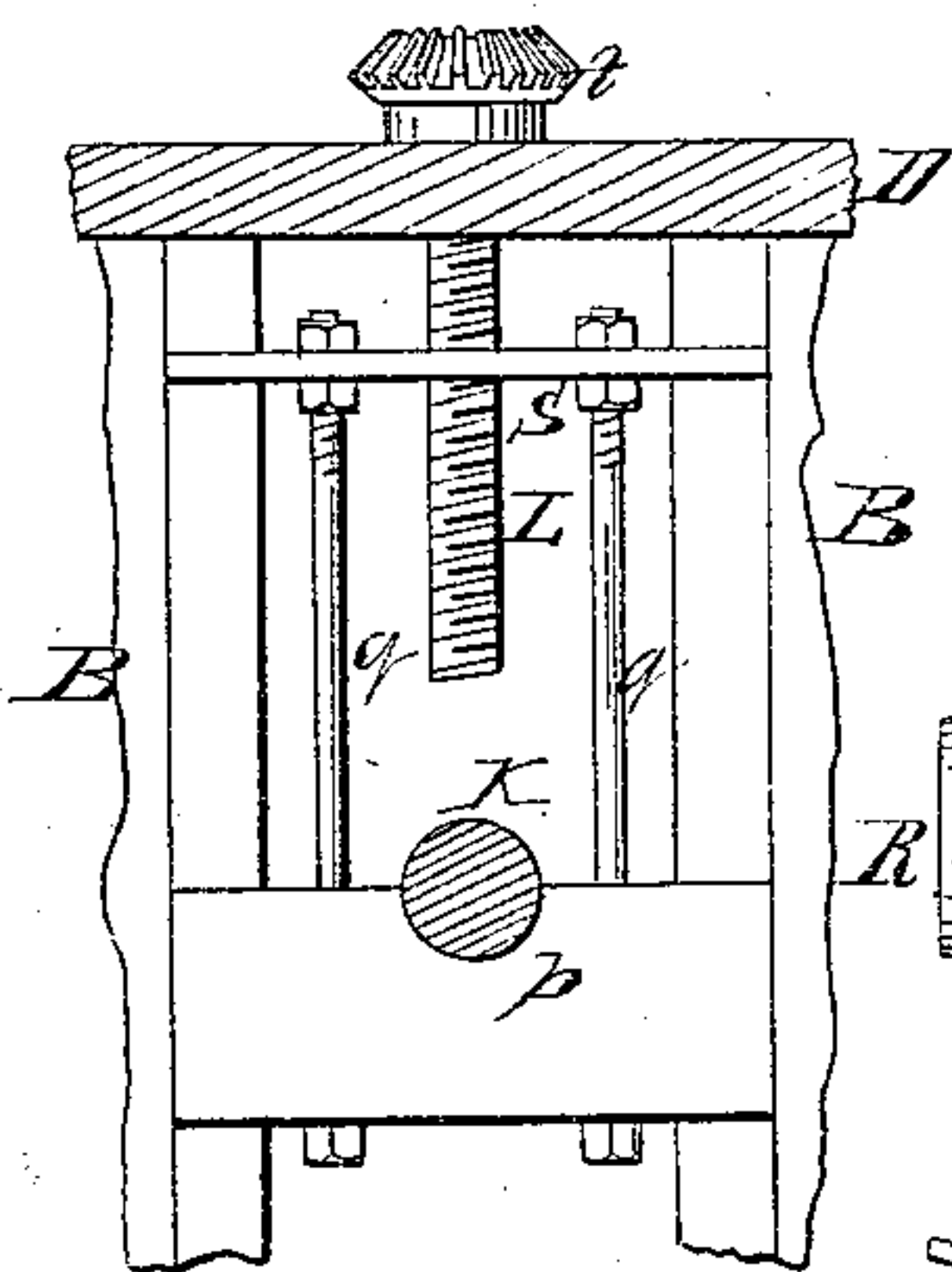


Fig: 3.

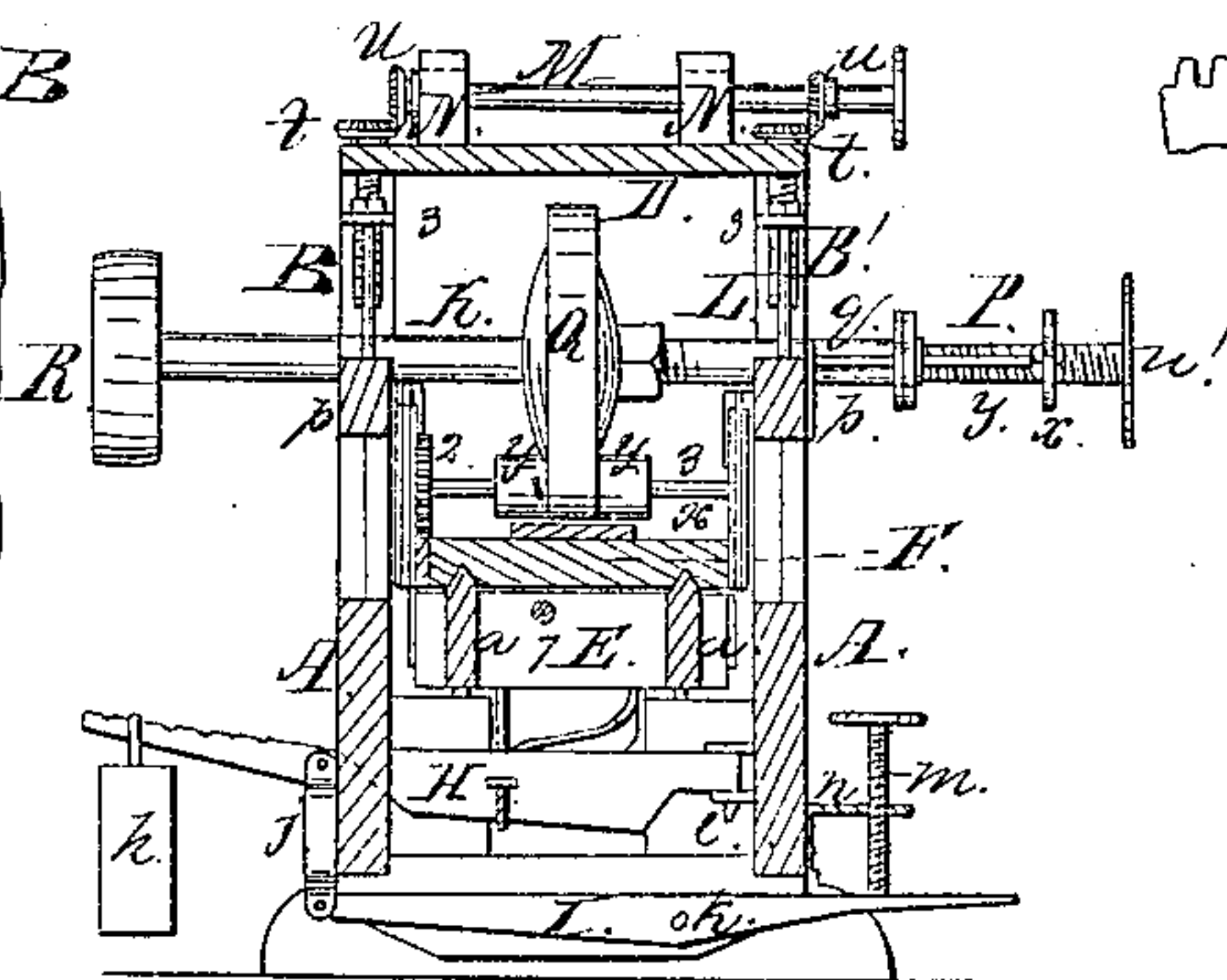
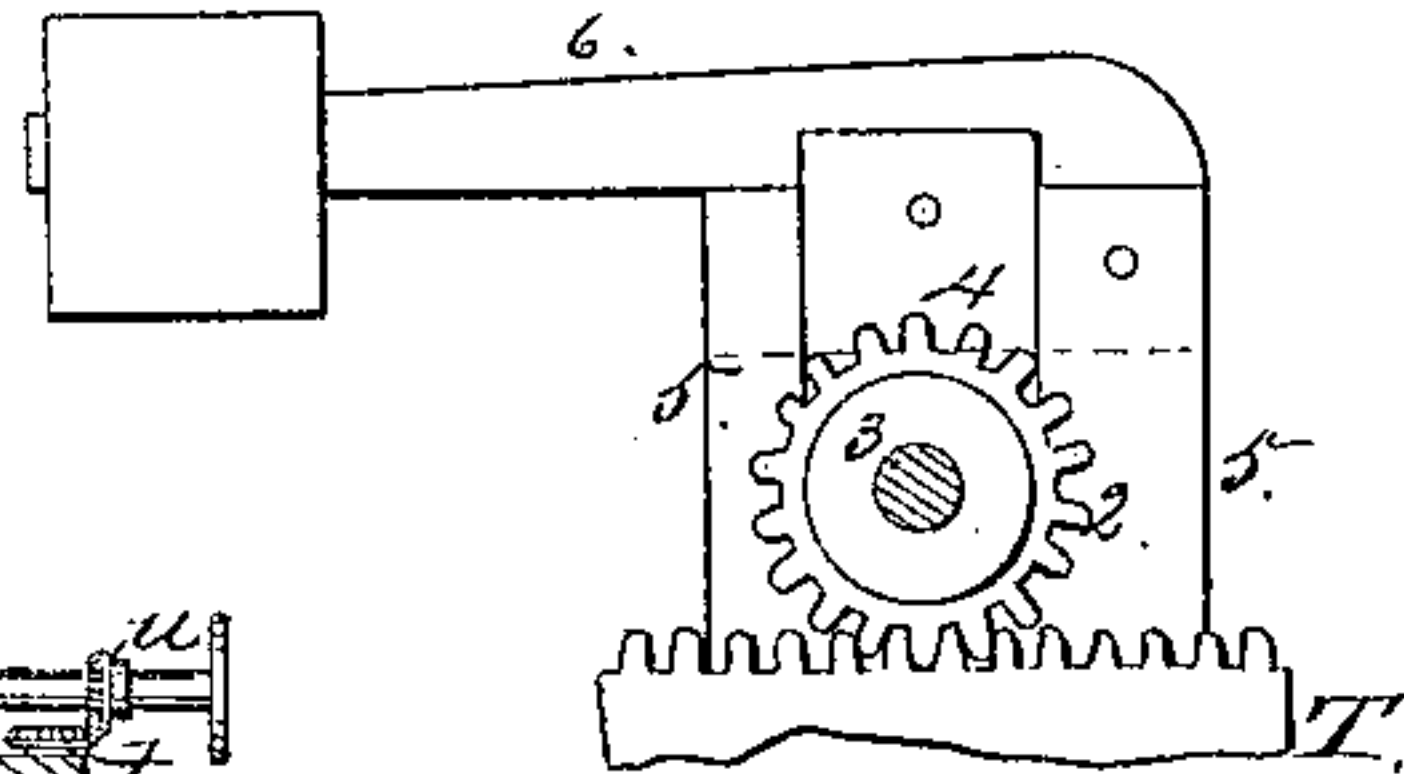


Fig: 5.



Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

EMANUEL ANDREWS, OF WILLIAMSPORT, PENNSYLVANIA.

IMPROVEMENT IN SAW-GRINDING MACHINES.

Specification forming part of Letters Patent No. 81,126, dated August 18, 1868.

To all whom it may concern:

Be it known that I, EMANUEL ANDREWS, of Williamsport, Lycoming county, Pennsylvania, have invented an Improved Saw-Grinding Machine; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My invention consists of certain mechanism, fully described hereinafter, for grinding saw-blades and reducing them to a proper tapering form.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawing, which forms a part of this specification, Figure 1 is a vertical section of my improved saw-grinding machine, Fig. 2 an inverted plan view, Fig. 3 a transverse section, and Figs. 4 and 5 parts of the machine drawn to an enlarged scale.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine, to which are secured the frames or standards B and B', the latter being connected together at the top by the cross-bar D. E is an oblong frame, having pins adapted to holes in the base-plate, or being otherwise so guided that it can have a limited vertical movement only, the opposite sides *a a* of the frame being beveled at the upper edge, so as to form V-shaped ways for the sliding bed F.

To the base-plate A are secured two rods, *e* and *e'*, on each of which is hung a lever, G, each lever consisting, in the present instance, of two bars united at one end, as seen in Fig. 2.

On the outer ends of the short arms of these levers rests the frame E, as shown in Fig. 1, and on the ends of the long arms of both levers rest projections on a third lever, H, which has its fulcrum at *i*, Fig. 3, and the outer end of which is furnished with an adjustable weight, *h*. The long arm of a fourth lever, I, Fig. 3, which has its fulcrum at *k* on a cross-bar of the base A, is connected by a link, *j*, to the lever H, the short arm of the said lever I being formed to receive the foot

of the attendant, and being limited, as regards its upward movement, by a screw, *m*, passing through a bracket, *n*, secured to the exterior of the base A.

K is a spindle turning in bearings *p p*, which are arranged to slide in vertical guides formed in the standards B and B', each bearing being connected by two bolts, *q q*, Fig. 4, to a plate, *s*, which is also arranged to slide in the said guides, and through which passes a screw-spindle, L, both screw-spindles turning in and being confined to the cross-bar D, and having bevel-wheels *t* gearing into similar wheels *w* on a transverse shaft, M, which is arranged to turn in suitable boxes N N on the said cross-bar D. (See Fig. 3.)

A screw-spindle, P, having threads adapted to similar threads in a plate, *x*, secured by bolts *y y* to one of the bearings *p*, (see Figs. 2 and 3,) is so coupled to one end of the spindle K that the latter can be moved to or fro transversely by operating the hand-wheel on the end of the said screw-spindle.

A grindstone, Q, is secured to the spindle K between the standards B and B', and one end of the said spindle is provided with a pulley, R, for receiving a driving-belt.

On one edge of the sliding bed F is a rack, T, into the teeth of which gear the pinions 2 2, on transverse shafts 3 3, each shaft being arranged to turn in bearings 4 4, which slide in guides 5 5, which are secured to the opposite edges of the sliding bed F, and which are acted on by weighted levers 6.

Each shaft has a roller, *y*, the arrangement of the two rollers in respect to the grindstone being best observed on reference to Fig. 1.

A screw-shaft, 7, is arranged to turn in the opposite ends of the oblong frame E, its threads being adapted to those of a nut, 8, which is confined to a projection on the under side of the bed F. One end of the screw-shaft is furnished with a bevel-wheel, gearing into a similar wheel on a transverse shaft, 9, which turns in the frame E, near one end of the same, this shaft being furnished with suitable pulleys for receiving driving-straps, and with suitable appliances by which an automatic reversal of the movement of the shaft 9, and consequently of the screw-shaft 7, may be effected, as in ordinary planing-machines.

Operation: The saw-blade to be ground is adjusted to the sliding bed F, between which, however, and the blade, intervenes a thin plate, x' , Fig. 3, of a shape conforming or nearly conforming to that of the said blade. It should be understood that in this machine there is no necessity for appliances for securing the blade and its plate, x' , simply placing both on their proper positions on the bed beneath the rollers $y y$ being all that is necessary, after which the bed may be released, so that the full force of the weighted lever H and levers G and G' may be exerted to raise the bed and cause the blade to bear against the stone.

A rapid rotary motion is now imparted to the grindstone Q, and a slow traversing movement, first in one direction and then in the other, is imparted to the bed. Owing to the rack T and pinions 2, the movement of the rollers $y y$ is controlled by that of the traversing bed, and these rollers are of such a diameter that their circumferences will move at precisely the same speed as the bed; hence the rollers afford an effective medium for confining the blade and its plate x' to the bed without exerting any drag which might tend to displace or strain either blade or plate.

As the bed approaches the limit of either its backward or forward movement, the blade and its plate will pass from beneath one or other of the rollers, but the remaining roller is amply sufficient to so confine the blade that it cannot be disturbed by the action of the stone.

An attendant can, at any time during the operation of the machine, alter the lateral position of the stone by turning the screw P, or can raise or lower the stone by turning the shaft M. Should it be necessary at any time to discontinue the operation of the stone on the blade, the attendant can in a moment lower the frame E with its bed by placing his foot on the lever I, and undue reduction of the blade may always be avoided by a proper adjustment of the screw m , which limits the upward movement of the bed.

It will be seen, on reference to Fig. 4, that the bearings $p p$ of the grindstone-shaft K may be separately adjusted vertically by the

bolts $q q$, and that the angle of the said shaft in respect to the surface of the bed can consequently be altered at pleasure. In view of this adjustability, and of the fact that the plate x , on which the blade rests, may be made of any required taper, it will be evident to those familiar with machinery of this class that any taper desired may be imparted to the blade, not only laterally, but also from end to end, or diagonally.

Without confining myself to the precise construction and arrangement of the several parts, as herein described, I claim as my invention and desire to secure by Letters Patent—

1. The combination of the sliding bed F, grindstone Q, and two rollers, 4 4, when the latter are geared to and their circumferences are caused to traverse at the same speed as the bed, substantially as described, for the purpose specified.

2. The combination of the traversing bed, the frame E, and the system of levers herein described, or the equivalent to the same, whereby a yielding upward pressure is applied to elevate the said frame and bed.

3. The combination of the said traversing bed, the frame E, the system of levers herein described, or their equivalents, and the set-screw m , or its equivalent, whereby the extent of the upward movement of the said bed may be limited without preventing the bed from yielding, when necessary.

4. The combination of the traversing bed, the grindstone-spindle, and its bearings, when the latter admit of separate vertical adjustment, as described.

5. The combination of the grindstone-spindle, the operating-screw P, and the devices or their equivalents connected therewith, for the purpose of imparting a lateral motion to the said grindstone.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMANUEL ANDREWS.

Witnesses:

H. HOWSON,
CHARLES HOWSON.