

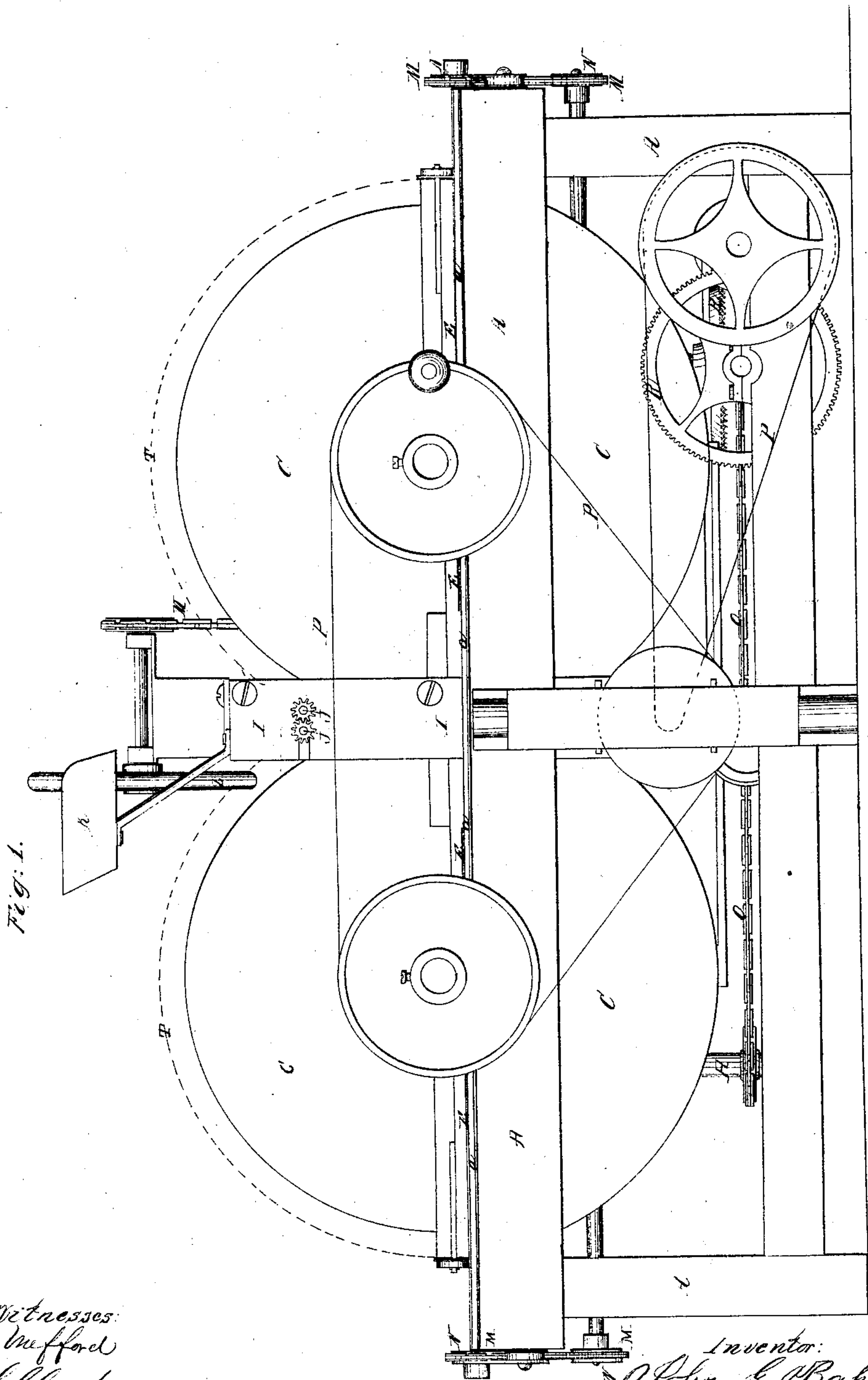
*J. G. Baker,*

*3 Sheets, Sheet 1.*

*Grinding Samps.*

*No 41,419.*

*Patented Feb. 2, 1864.*



*Witnesses:*  
*Dr. Mefford*  
*J. Clayton.*

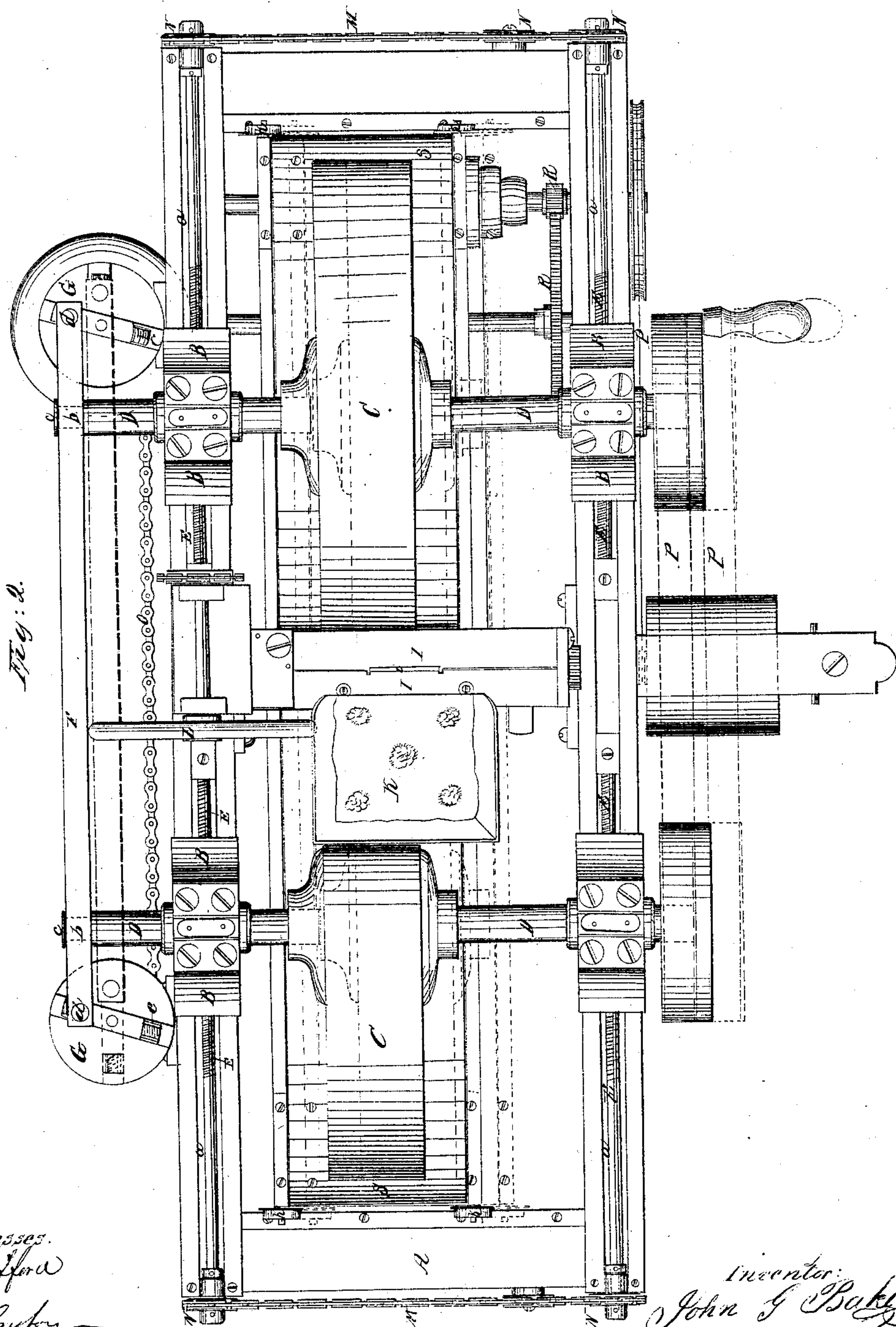
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*Grinding Saws.*

*3 Sheets, Sheet 2.*

*No 41,419.*

*Patented Feb. 2, 1864.*



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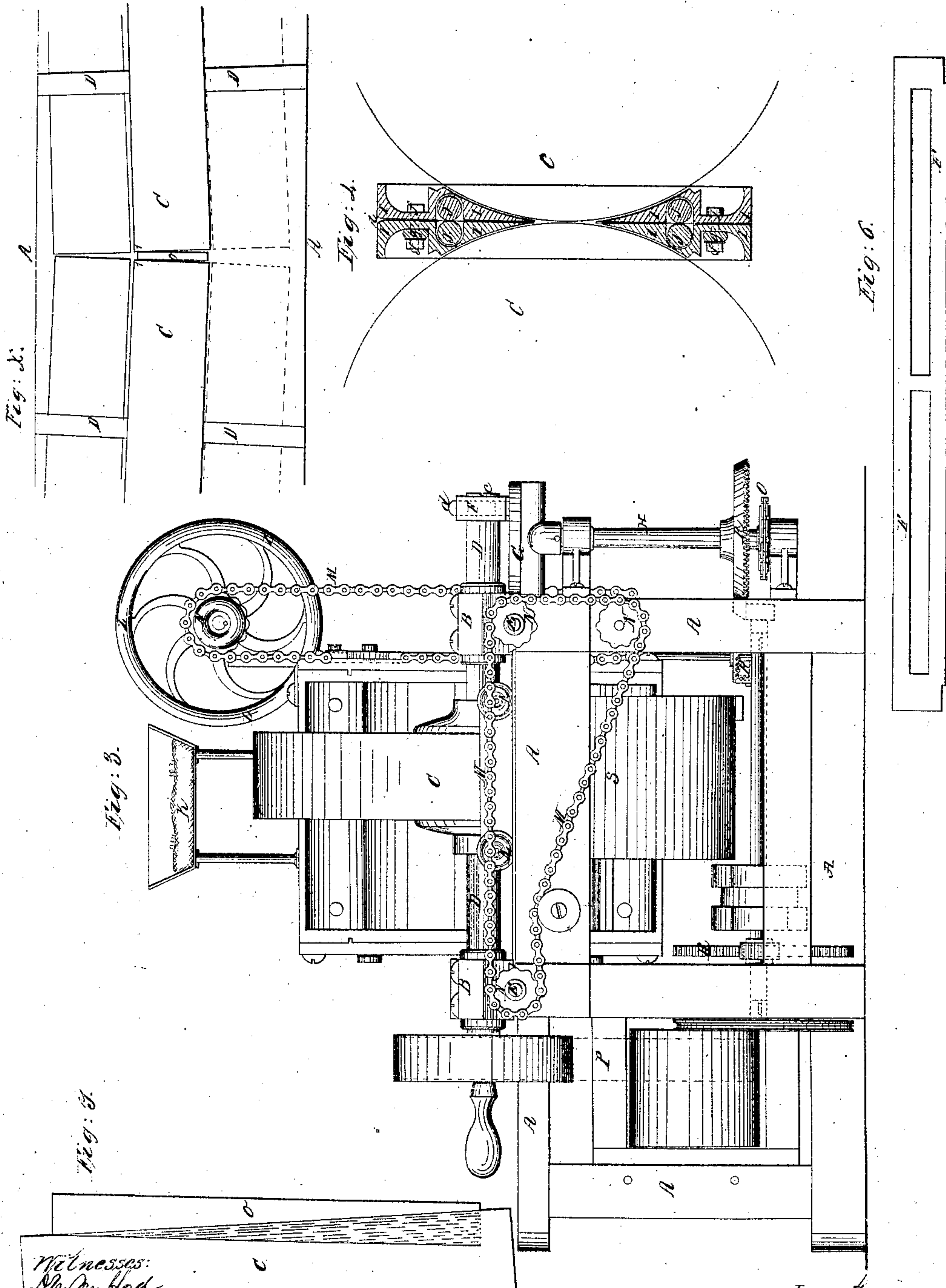


*J. G. Baker,*  
*Grinding Saws.*

*3 Sheets, Sheet 3.*

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*Patented Feb. 2, 1864.*



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# UNITED STATES PATENT OFFICE.

JOHN G. BAKER, OF WASHINGTON, DISTRICT OF COLUMBIA.

## IMPROVEMENT IN GRINDING SAWS.

Specification forming part of Letters Patent No. 41,419, dated February 2, 1864; antedated January 22, 1864.

*To all whom it may concern:*

Be it known that I, JOHN G. BAKER, of Washington city, in the District of Columbia, have invented certain new and useful Improvements in Machines for Grinding and Polishing Saws; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon marked.

In the several figures similar characters refer to like parts.

Figure 1 is a side elevation. Fig. 2 is a plan view. Fig. 3 is an end elevation. Fig. 4 is a longitudinal vertical section of the feeding-frame, showing the operation of the feed-rollers. Fig. 5 shows the slotted traverse-bar.

The caps which cover the grit-stones are not seen in the drawings, being detached in order to represent other parts of the machine more clearly.

The nature of my invention consists in grinding saws thinner at the back than at the edge between two grindstones set at angle to each other, which simultaneously traverse the faces of the saw, thereby giving the saw-blade the desired wedge shape and grinding both sides at once; also, in continuously feeding the saw-blades down through the feed-frame between the feed-rollers and between the stones; also, in making the casing (which contains the water used in grinding, and which covers the stone and prevents the flying of the water) traverse simultaneously with the stones.

To enable others to make and use my invention, I will describe its construction and operation.

In the drawings, A indicates a stout rectangular frame-work of a height from the floor somewhat more than the radius of the grindstones. Along the edges of the top of the frame are laid grooved ways *a*, upon which the four plumber-blocks, B, slide.

Care the grinding or polishing stones, which may be of any suitable substance or size. Each of the stones C is provided with an axle, D, whose bearings are in the sliding plumber-blocks D. These axles D extend beyond their journals sufficiently for the attachment of the devices which give them both a revolving and a traverse lateral motion.

E are four right and left screws, which lie in the grooves of ways *a* and operate the plumber-blocks so as to make the stones approach each other at the desired angle at which they are set in the first instance.

F is the slotted traverse-bar. In the slots of this bar the necks *b* (see Fig. 2) of the axles D are secured by collars *c*. The ends of the bar F are pivoted like a connecting-rod to the arms *d* of the extension-cranks G.

G are extension-cranks upon the upper ends of the vertical shafts H, whose bracket journal-boxes extend from the frame-work. The "throw" or "swing" of the cranks is regulated by the set-screws *e*, which regulate the distance of the crank-pins *d* from the main crank-shafts H.

I is a vertical double rectangular frame secured to the frame A, and is so constructed (see Fig. 4) as to be between the two stones except at a short central space, where the curved faces of the stones (red lines, Fig. 4) pass through and touch each other, or the opposite sides of a saw. The two halves of this are secured together by means of the screw-bolts *f*, which are provided with rubber springs *g*.

J J are two pairs of feed-rollers, having their bearings in the opposite halves of the frame I. The springs *g* serve to make the feed-rollers approach each other so as to come into close contact with the saw and feed it down between the two stones.

K is the seat for the operative, who feeds the saws into the slit *i* of frame I, pushing them downward until they are taken hold of by the feed-rollers.

L is the operating-wheel (on the upper part of the wheel at the left of the seat) for controlling the stones and making them approach or retire from each other, as may be needed in the different stages of the grinding or polishing process.

A suitable system of endless chains M and chain-pulleys N connect the wheel L to the four right and left screws E, so that turning-wheel L turns the screws E so as to operate the stones.

An endless chain, O, and chain-pulleys on the lower ends of vertical shafts H make the expansion-cranks G move alike.



The machine is operated by a suitable system of belts, P, and gearing R.

S is the casing for holding the water, and in which the two stones play. This casing extends the whole length of the machine, and is supported upon small wheels *k* at each end, which roll upon ways on the ends of the frame A. The casing traverses with the stones.

T are the casing-caps, shown in drawings only by dotted lines in Fig. 1.

It is well known that a good hand-saw should be ground thinner on the back than on the cutting-edge, tapering regularly from the edge to the back. Unless the saw is thus ground it will be necessary to give a large degree of "set" to its teeth in order that it may cut freely without "buckling." When properly ground, however, there is no need of any set. The mode in common use with the best saw-makers for grinding their saws with a taper is to fasten the saw-blade to a board, which a skilled workman holds on his knee against a grindstone, shifting the saw from toe to heel until it is finished. It is evident that this method is slow, expensive, and imperfect. Many devices have been designed for this purpose, but none have proven satisfactory.

A first-rate hand-saw should be about four one-hundredths of an inch thick on the cutting-edge and three one-hundredths of an inch on the back.

In the building of my machine the plumber-blocks are cast hollow and fitted to their ways, the right and left screws, endless chains, pulleys, and wheel L being so arranged as to operate the plumber-blocks squarely and simultaneously. The axles are then put into the hollows of the plumber-blocks, and Babbitt metal is run around them. By this arrangement the stones are kept constantly at the desired angle, and as they wear away by use they can be brought nearer each other, still preserving the same angle until the stones are worn down to a size too small for use.

In the operation of my invention, power being properly applied, the operative inserts the end of a saw-blade in the slit *i* of frame I, pushing it down until seized by the feed-rollers, which carry it down between the stones. Since the two stones revolve in opposite directions in order to grind, it is necessary to provide a contrivance for forcing the saw down between them, counteracting their tendency to keep it stationary. This is accomplished by my frame I, which contains the feed-rollers and guides

the saws. At the same time that the saw is descending the two stones are grinding it upon both sides, giving it the desired taper, and at the same time the two stones are traversing back and forth across the faces of the saw, the traversing being effected by the action of the expansion-cranks upon the slotted traverse-bar which is connected to and operates the axles of the stones. Fig. X is a diagram showing the operation of the stones, which are here shown at an exaggerated angle; *o*, the saw. The red and dotted lines indicate the opposite extremes of the traverse motion. When the stones first commence grinding the saw, their edges 11 first come in contact with the saw at its edges 2 2, so that if there was no traversing across the saw the stones themselves would soon be worn away at a bevel, so that succeeding saws would be ground straight; but this disadvantage is entirely overcome by the traversing of the entire faces of both stones past the edges 2 2 of the saw, so that the faces of the stones are kept straight so as to retain their initial relative angle. After a suitable number of saws have gone through the machine the operative gives the wheel L a very slight turn, so as to bring the stones somewhat nearer together. The saws are then run through again, and have another angular portion ground off. This process is repeated a sufficient number of times until the grinding is finished and the saws are ready for polishing.

Fig. Z is a magnified view of a saw with exaggerated taper, the red lines indicating the successive angular portions ground off at the several passages of the saw through the machine.

Having thus fully described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. Grinding saws by means of two traversing grindstones set at an angle with each other.
2. Feeding saws to be ground between two revolving grindstones by means of the frame I and feed-rollers J.
3. The expansion-cranks G, in combination with the slotted traverse-bar F.
4. The frame I, in combination with the rollers J and springs *g*.

JOHN G. BAKER.

Witnesses:

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