

(No Model.)

3 Sheets—Sheet 1.

A. KRIEGER.

SAW TOOTH GRINDING MACHINE.

No. 302,205.

Patented July 15, 1884.

Fig. 1.

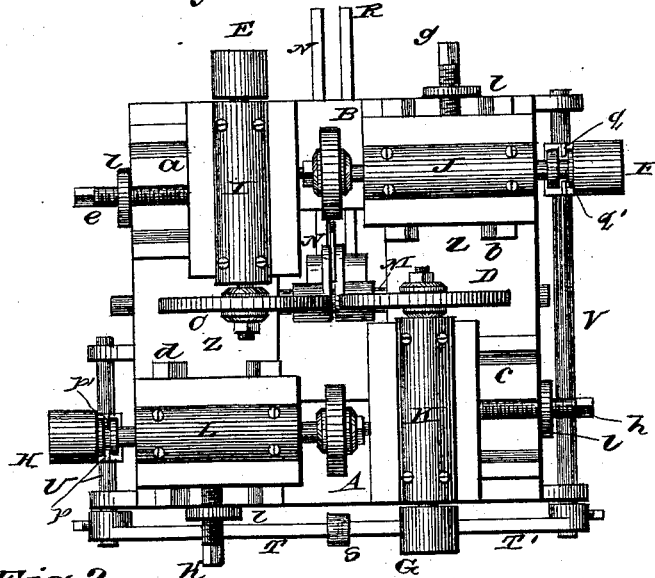


Fig. 2.

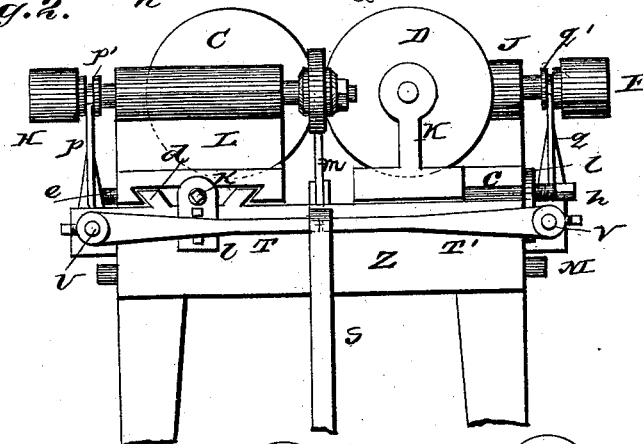
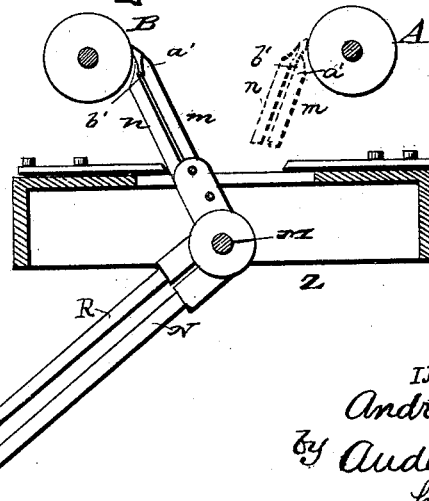


Fig. 5.



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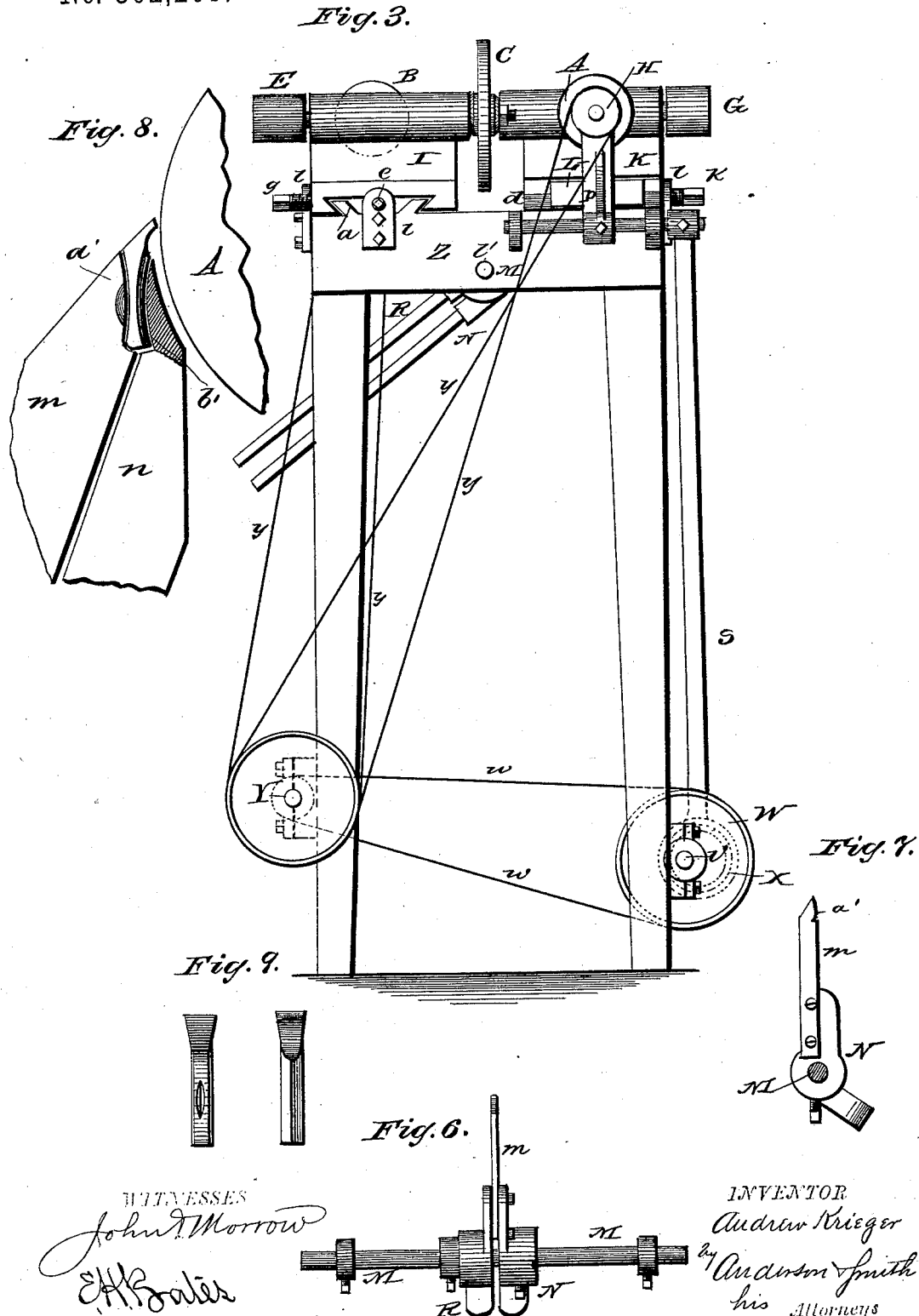
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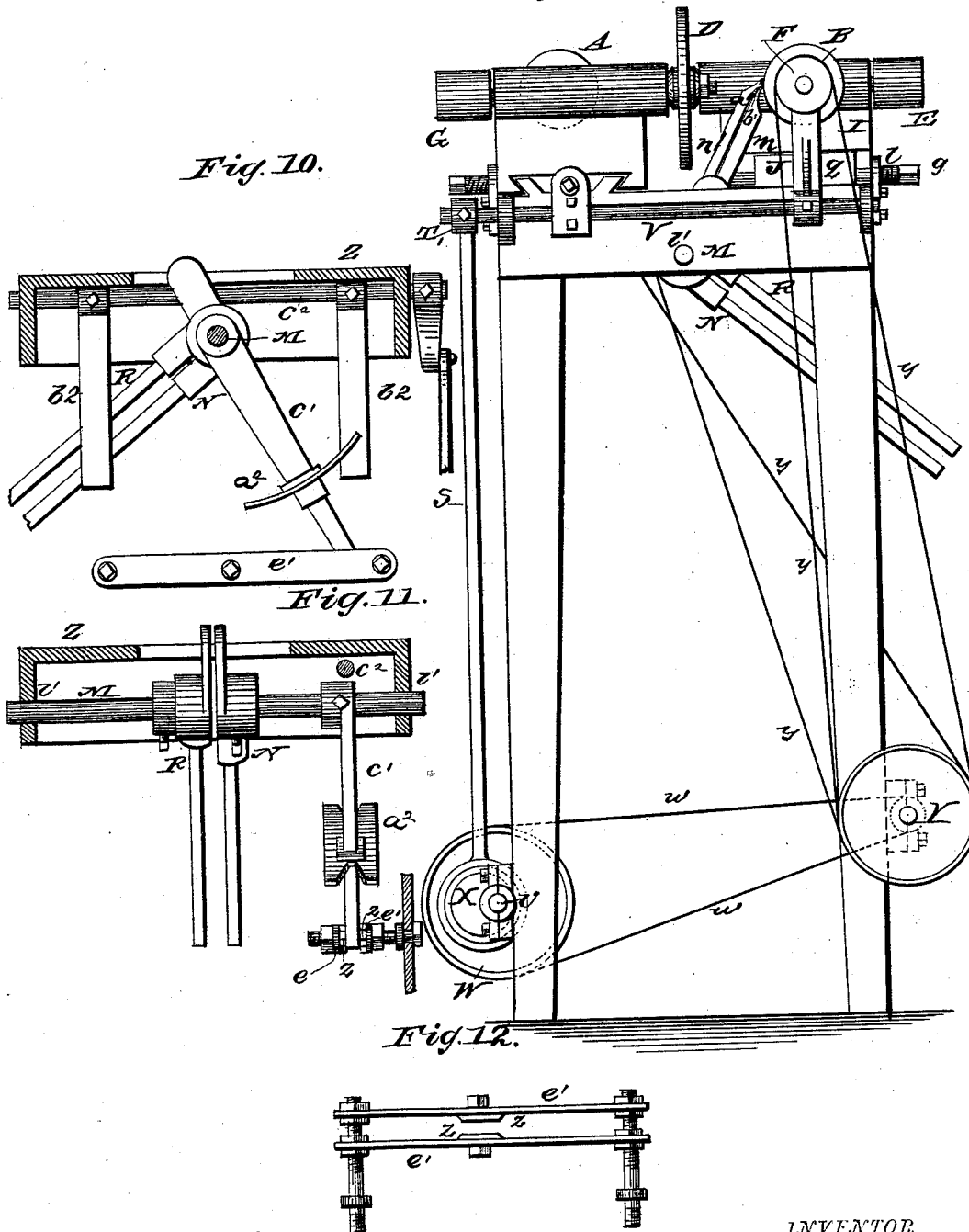
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Fig. 4.

Fig. 10.

Fig. 11.

Fig. 12.



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# UNITED STATES PATENT OFFICE.

ANDREW KRIEGER, OF COLUMBUS, OHIO, ASSIGNOR TO JAMES OHLEN, OF  
SAME PLACE.

## SAW-TOOTH-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,205, dated July 15, 1884.

Application filed March 26, 1884. (No model.)

*To all whom it may concern.*

Be it known that I, ANDREW KRIEGER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Saw-Teeth-Grinding Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

15 This invention is designed to facilitate the operation of grinding the cutting-edges of the teeth for inserted-tooth saws; and it consists in the construction and novel arrangement of devices, all as hereinafter set forth and claimed.

20 The object of this invention is to provide a machine whereby a tooth can be by two motions ground to the proper dimensions in a positive and exact manner.

In the accompanying drawings, Figure 1 25 represents a plan view of the machine. Fig. 2 is a partial front elevation. Fig. 3 is a side elevation on the left. Fig. 4 is a side elevation on the right. Fig. 5 is a transverse sectional elevation showing the holding device or vibratory clamp. Figs. 6, 7, 8, 9, 10, 11, 30 and 12 illustrate details of the combination.

The letters A, B, C, and D represent four emery-wheels mounted on shafts and bearings on the frame Z, and E, F, G, and H, respectively, the leading pulleys on the shafts of said emery-wheels.

I, J, K, and L, respectively, represent slide-bearings in which the shafts of the emery-wheels A, B, C, and D are mounted, these bearings engaging guides *a*, *b*, *c*, and *d*, which are 40 secured to the table or frame at right angles, respectively, to the direction of the shafts of the emery-wheels, so that the latter can be adjusted in an exact manner toward or from the central point of the table. This adjustment is made by means of screws *e g h k*, connected to the slide-bearings, and working through threaded bearings *l* of the framing, as shown.

50 The holding-clamp consists of the angular

lever N, keyed to the shaft M, which is seated in bearings *l'*, said shaft having the fixed jaw *m* and the lever R pivoted to said shaft M and adapted to operate the movable jaw *n*. When the levers R and N are slightly separated, the 55 jaws *m* and *n* separate to allow the introduction of the shank of an inserted tooth. When the levers are brought toward each other, the jaws are closed, holding the tooth firmly. Seats *a'* and *b'*, of proper form to exactly fit the shank 60 of the tooth, are made in the ends of the jaws *m* and *n*, so that each tooth placed between the jaws will be held thereby exactly in the same position.

Y represents a shaft carrying pulleys from 65 which run belts *y* to the pulleys F and H, the pulleys E and G being connected by belts to an overhead counter-shaft.

From a pulley on the shaft Y extends a belt, 70 *w*, which engages the pulley W on a shaft, *v*, carrying an eccentric, X, to which is connected a pitman, S, having at its upper end a box engaging the ends of the lever-arms T and T' of the rock shafts U and V, respectively. These rock-shafts are provided with arms *p* 75 and *q*, which engage grooved collars *p'* and *q'* on the shafts of the emery-wheels A and B, and operate to slowly vibrate said wheels from side to side in a limited path of motion continuously during the operation of the machine. 80 The operator, taking a tooth between the thumb and forefinger of his left hand, by means of his right hand presses the handles of the clamp-holder apart, separating the points of the jaws, and inserts with his left hand the 85 tooth between the points of the jaws. He then closes the handles, causing the jaws to grip the tooth securely. By pressing downward upon the handles the tooth is brought forward against the wheel B, which operates 90 to grind the face of its points. By raising the handles of the clamp the tooth is moved backward between the wheels C and D, which grind its sides, reducing it to the proper width, said wheels having been accurately adjusted 95 by means of their slides and the screws *h* and *k* therewith connected. Continuing to raise the handles of the clamp, the tooth is carried still farther to the rear, until it comes in contact with the wheel A, which grinds the back 100

of the point portion. The proper length is obtained by the adjustment of the wheels A and B. Through the medium of the screws *e* and *g* the tooth may be passed several times back and forth, at each movement coming in contact with all the emery-wheels. As the tooth passes entirely over the wheels C and D they will preserve an even grinding-surface; but the wheels A and B are differently affected, and would be grooved or worn in ridges, unless they were laterally vibrated, as heretofore described, or unless the tooth-holder were vibrated from side to side when in contact therewith. The former method, being the most simple, is preferred; but the tooth-holder may be easily vibrated by providing its shafts with an arm, *c'*, carrying a cross-plate, *a'*, having notches in its ends, as shown, to engage arms *b'' b''* of a rock-shaft, *c''*, having a lever-arm operated by a pitman from the eccentric X.

In order to steady the tooth-holder while the tooth is passing between the wheels C and D, guide-plates *e' e'* are provided, having at the proper points heavy washers *z z*, bolted on the inner side, said washers having their inner surfaces at the exact distance apart to prevent the passage of the lever without vibration. Either of these vibratory devices will answer the purpose, enabling the machine to produce a square and straight edge at the point of the tooth.

Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for grinding the teeth for inserted-tooth saws, the combination, with the four emery-wheels arranged in proper rotative position, of a vibratory tooth-holding clamp, substantially as specified.

2. In a machine for grinding the teeth for inserted-tooth saws, the combination, with the side-grinding emery-wheels C and D, of the front and back point-grinding wheels A and B, the shafts, slide-bearings, and adjusting devices therefor, and of the vibratory tooth-holding clamp pivoted in the machine, substantially as specified.

3. In a machine for grinding the teeth for inserted-tooth saws, the combination, with the vibratory tooth-holding clamp, of the adjustable front and back point-grinding wheels A and B, and automatic vibrating mechanism in connection with said wheels, whereby they are moved from side to side continuously during the operation of the machine, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW KRIEGER.

Witnesses:

LORENZO D. HAGERTY,  
B. GARD EWING.