

No. 684,362.

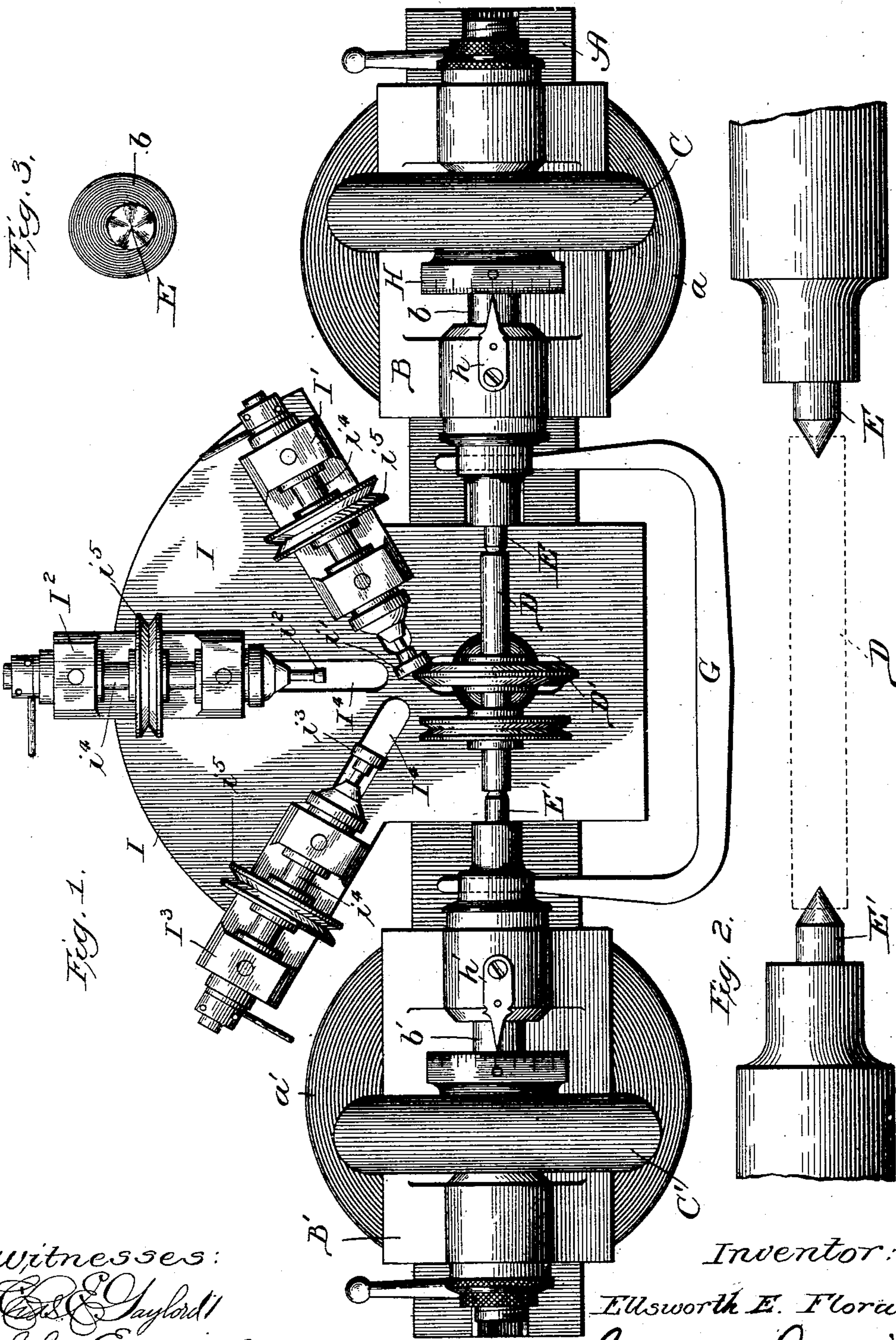
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E. E. FLORA.

MACHINE FOR GRINDING AND POLISHING RULING WHEELS.

(Application filed Feb. 16, 1901.)

(No Model.)



Witnesses:

Edw. J. Gaylord,
John Enders, Jr.

Inventor:

Ellsworth E. Flora,

By Banning & Banning,
Attys.

UNITED STATES PATENT OFFICE.

ELLSWORTH E. FLORA, OF CHICAGO, ILLINOIS, ASSIGNOR TO DWIGHT K. TRIPP, OF SAME PLACE.

MACHINE FOR GRINDING AND POLISHING RULING-WHEELS.

SPECIFICATION forming part of Letters Patent No. 684,362, dated October 8, 1901.

Application filed February 16, 1901. Serial No. 47,689. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH E. FLORA, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Grinding and Polishing Ruling-Wheels, of which the following is a specification.

My invention relates to that class of mechanisms that are known as "ruling-wheels" and which are used for ruling lines on photographic screens, plates, sensitized paper, &c., and has for its object the providing of a simple, economical, and efficient machine for grinding the ruling-wheels.

The invention consists of the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a full-sized plan view of a machine embodying my improvements looking at it from the top; Fig. 2, an enlarged elevation of the arbor on which the ruling-wheel is held and mounted and the centers upon which it is adapted to rotate for the purpose of grinding, and Fig. 3 an elevation of one of the spindles and centers.

In the art to which this invention relates it is well known that in ruling photographic screens, plates, printing-paper, &c., an ordinary draftsman's pen cannot be used with success in that the point rapidly wears away. Even when such pens are fitted with diamond points they wear with comparative rapidity and are also very difficult to keep in adjustment, so as to produce a large number of lines of uniform width. It has therefore become necessary to use a wheel made of hard stone and of such a class of stone that it is free from flaws. These wheels are provided with a V-shaped periphery, the angles of which are in the neighborhood of sixty degrees on a side and provided with practically a flattened apex of the width of the line which it is desired to rule. It has been extremely difficult in the past to give this ruling-wheel the desired angles—that is, to make both sides of the angles exactly the same and at the same time provide a perfect apex, either of a sharp edge or slightly flattened, and have all of such parts concentric with

the axis of the arbor upon which the wheel is mounted.

The principal object, therefore, of my invention is to provide satisfactory mechanism by which the proper angles and configurations may be given to the periphery of the ruling-wheel.

In constructing a machine in accordance with my improvements I make a bed portion A of the desired size and shape and preferably provided with two pedestals *a* and *a'*, located at or near each end of the bed portion, so as to minimize the danger of springing the bed. Adjustably mounted on this bed are two head-stocks B and B', provided with lathe-spindles *b* and *b'*, mounted in the usual bearings, either the usual watchmaker's lathe-bearing of antifriction angles or parallel bearings, which should be hardened, so as to reduce the amount of wear. These spindles are provided with circular handles C and C', resembling largely the ordinary globe-valve wheel or handle.

In order to support the arbor D, upon which the ruling-wheel D' is mounted, in a manner that it may freely revolve and be fed to the grinding mechanism, hereinafter described, I provide the lathe-spindles of the head-stocks with centers E and E', which in this instance are dead-centers—that is, are not arranged to be rotated. These centers are placed in the spindles eccentric to the axis of the spindles and in positive line with each other, so that as the spindles are oscillated or rotated the arbor, with its ruling-wheel, is moved nearer to or farther from the grinding mechanisms in a parallel manner, as will be hereinafter more fully described.

As shown in Fig. 1 of the drawings, the arbor is mounted upon the dead-centers of both of the lathe-spindles, with the centers in line with each other, though eccentric to the axis of the spindles. It is therefore desirable or necessary that means should be provided to oscillate these spindles with their dead-centers simultaneously—that is, that they should be moved in exactly the same plane at all times, so as to carry the arbor forward and backward in a parallel manner. In order to accomplish this result, the spindles are provided with perforations transverse to

their axis, and into these perforations are inserted the free ends of a U-shaped handle G, so that the spindles of the head-stocks can be oscillated simultaneously and in a parallel manner.

In order to show the amount of oscillation and also to tell whether both spindles are being oscillated to a similar extent, the spindles are provided with graduating-wheels H and H' and the fixed portion of the head-stocks with indicators h and h'. By this means it will be seen that the position of the head-stocks may be at all times regulated or ascertained.

In order to provide means for grinding equal angles on each side of the periphery of the ruling-wheel and to flatten the apex of the same when desirable or necessary, a grinding-rest I is provided and bolted or otherwise secured to the bed portion. This grinding-rest is provided with three grinding-heads I', I², and I³, adjustably mounted in the grooves or slots I⁴, so as to be moved backwardly and forwardly, the grinding-heads I' and I³ being located at an angle to the bed of the lathe somewhere in the neighborhood of thirty degrees, so that the faces of the grinding-laps i' and i³ will grind an angle on the periphery of the ruling-wheel. These laps are mounted in spindles i⁴, the necessary rotation of which may be given by means of the grooved pulleys i⁵. The grinding-head I² is located at right angles to the bed of the lathe, so that the face of its lap i² will grind the ruling-wheel so as to give it a perfectly flat apex parallel to the axis of the arbor upon which the ruling-wheel is mounted.

In operation when it is desired to grind one face of the periphery of the ruling-wheel, as shown in Fig. 1, one of the grinding-heads is moved forward in position to contact the ruling-wheel, the necessary rotations are given to the grinding-lap and ruling-wheel, and the wheel moved into contact with the grinding-lap by means of the handle G until the desired amount has been taken off of the ruling-wheel. The operation is repeated on the opposite side of the ruling-wheel by withdrawing the head I' and moving the head I³ so as to bring its lap into contact with the wheel. When this lap i³ has performed its grinding,

it is moved backward and the head I² moved forward until its lap grinds a sufficient amount off the apex of the ruling-wheel.

I claim—

1. In a machine of the class described, the combination of an arbor for holding an object to be ground, two grinding devices arranged at an acute angle to the arbor and at an obtuse angle to each other, and one grinding device arranged at right angles to the arbor, substantially as described.

2. In a machine of the class described, the combination of an arbor for holding an object to be ground, two grinding devices arranged at an acute angle to the arbor and at an obtuse angle to each other and severally adjustable toward and from the object to be ground, and one grinding device arranged at right angles to the arbor and adjustable toward and from the object to be ground, substantially as described.

3. In a machine of the class described, the combination of a bed or frame portion, two oscillating spindles mounted in line with each other so as to provide a space between them, a center mounted eccentrically in each spindle and in line with the center in the opposite spindle, a grinding rest or bed, and two grinding-heads adjustably mounted on such rest or bed opposite to each other and at equal angles to the lathe-spindles, and means for oscillating the spindles simultaneously, substantially as described.

4. In a machine of the class described, the combination of a bed portion, two lathe-heads adjustably mounted on such bed portion, oscillating spindle in each head mounted in line with the spindle in the opposite head, a center eccentrically mounted in each spindle and in line with the center in the opposite spindle, a grinding-rest, two grinding-heads mounted on such rest opposite to each other and at equal angles to the lathe-spindles, a third grinding-head adjustably mounted on such rest at right angles to the lathe-spindles, and means for oscillating the lathe-spindles simultaneously substantially as described.

ELLSWORTH E. FLORA.

Witnesses:

THOMAS A. BANNING,
THOMAS B. MCGREGOR.