M. A. THIEL.

MACHINE FOR GRINDING CAMS.

APPLICATION FILED MAR. 31, 1906.

957,392.

Patented May 10, 1910.

2 SHEETS—SHEET 1.

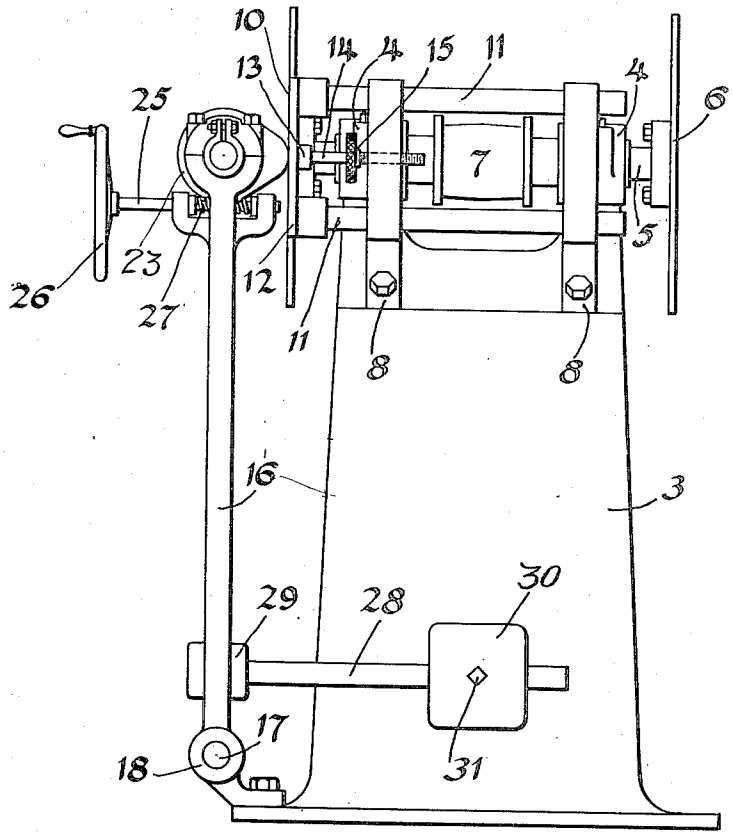

Fig. 1.

WITNESSES:

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E. W. McCallister

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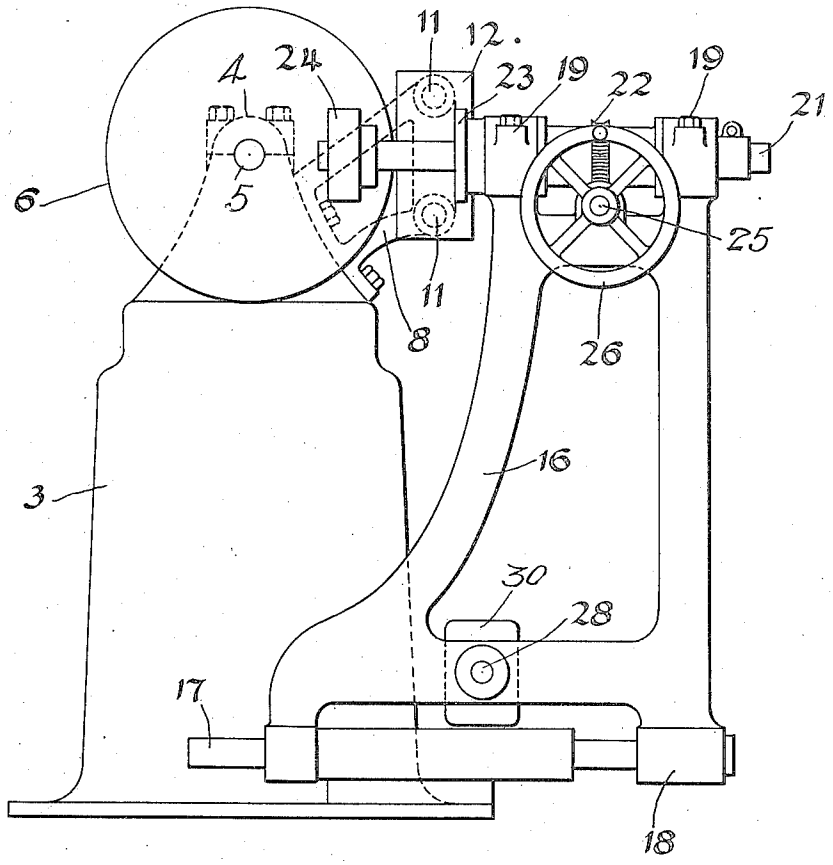

Fig. 2.

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UNITED STATES PATENT OFFICE.

MARTIN A. THIEL, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO THE WESTINGHOUSE MACHINE COMPANY, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR GRINDING CAMS.

957,392. Specification of Letters Patent. Patented May 10, 1910.

Application filed March 31, 1906. Serial No. 309,133.

To all whom it may concern:

Be it known that I, MARTIN A. THIEL, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Machines for Grinding Cams, of which the following is a specification.

This invention relates to grinding machines and more particularly to the production of machines adapted to be utilized in grinding and finishing cams.

The object of this invention is the production of means for grinding cams and cam surfaces which may be utilized in connection with any grinding machine.

A further object is the production of cheap and simple means in connection with a grinding machine whereby the labor of grinding cams and cam surfaces is greatly reduced.

In the drawings accompanying this application and forming a part thereof; Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end elevation of a machine shown in Fig. 1.

The frame portion 3 of a grinding machine is provided with bearings 4 in which the shaft 5, which is provided with grinders or emery wheels 6 and driven by a pulley 7, is mounted. Brackets 8 are mounted on the frame portion 3 and are provided with suitable ways in which rods 11 are mounted. The rods 11 are adapted to reciprocate longitudinally through the ways and are provided at one end with a rigidly mounted former plate 12, the face 10 of which is parallel with the grinding face of one of the grinders 6. The plate 12 is provided with a lug 13 in which the end of a threaded rod 14 is mounted. The threaded portion of the rod extends through a suitable tapped hole in the bracket 8 and is provided with a knurled hand-wheel 15, adapted to adjust the position of the plate by moving it toward and away from the bracket 8. A reciprocating carriage 16 is mounted on a shaft or arbor 17, which is mounted in a bearing housing 18 through which it is adapted to move longitudinally. The carriage is provided with bearings 19 in which a rotatable shaft 21 is journaled. The shaft 21 is provided with a worm wheel 22 and is adapted to carry at one end a pattern cam 23 in contact with the former plate 12 and a cam 24 in contact with the grinding face of one of the finishing wheels 6. A shaft 25 is suitably journaled on the carriage portion and is provided with an operating hand wheel 26 and a worm 27, which meshes with the worm wheel 22. A lever 28 is rigidly mounted in a suitably located lug 29, which is formed integrally with the carriage 16, and is provided with a counter-balancing weight 30, which is adapted to slide longitudinally along the rod, and is provided with a set screw 31. The arrangement is such that for different positions of the weight 29 the cam 24 will be held against the face of the grinder disk 6, and the cam 23 against the face of the former plate 12 with greater or less pressure.

In grinding a cam, a rough cam that is to be shaped and finished is placed on the shaft 21 at 24 and the former plate 12 is moved to such a position that it will contact with the pattern cam 23 and regulate by its position the amount to be ground from the cam 24, and the shaft 21 is rotated by turning the hand wheel 26. It is apparent that the cam at 24 will be ground to correspond in shape to the cam 23 and that its size will be dependent on the position of the former plate relative to the grinding surface of the disk 6. The weight 29 can be moved to such a position that the cam 24 will be held against the grinding surface with greater or less pressure and the carriage 16 can be moved relative to the bearing 18 so that any portion of the grinding surface of the disk 6 will be effective. It is apparent that the cam may be easily finished to correspond in contour with the former cam and that the carriage 16 and brackets 8 may be connected with a grinding machine of any type.

What I claim is:

1. In combination in a grinding machine, a rotatable grinding wheel, an adjustable former plate, the operating face of which is parallel to the grinding face of said wheel, an oscillating carriage, a rotatable shaft mounted on said carriage, a former cam mounted upon said shaft and adapted to contact with said former plate to cause said carriage to move toward and away from said grinding wheel, and an adjustably weighted arm rigidly connected to said carriage to cause contact between said cam and said former plate.

2. In combination in a grinding machine,

a rotatable grinding wheel, an adjustable former plate, the operating face of which is parallel to the grinding face of said wheel, an oscillating carriage, a rotatable shaft mounted on said carriage, a former cam mounted on said shaft and adapted to contact with said former plate and to cause said carriage to move toward and away from said grinding wheel, an adjustably weighted arm secured to said carriage to cause contact between said cam and said former plate, and means for moving said former plate backward and forward relative to the grinding face of said wheel.

3. In combination in a grinding machine, a rotatable grinding wheel, a former plate, an oscillating carriage, a rotatable shaft mounted on said carriage, a former cam mounted on said shaft and adapted to contact with said former plate to cause said carriage to move toward and away from said grinding wheel, and an adjustably weighted arm secured to said carriage to cause contact between said cam and said former plate during the revolution of said cam.

In testimony whereof, I have hereunto subscribed my name this 30th day of March, 1906.

MARTIN A. THIEL.

Witnesses:
CHARLES W. MCGHEE,
E. W. MCCALLISTER.