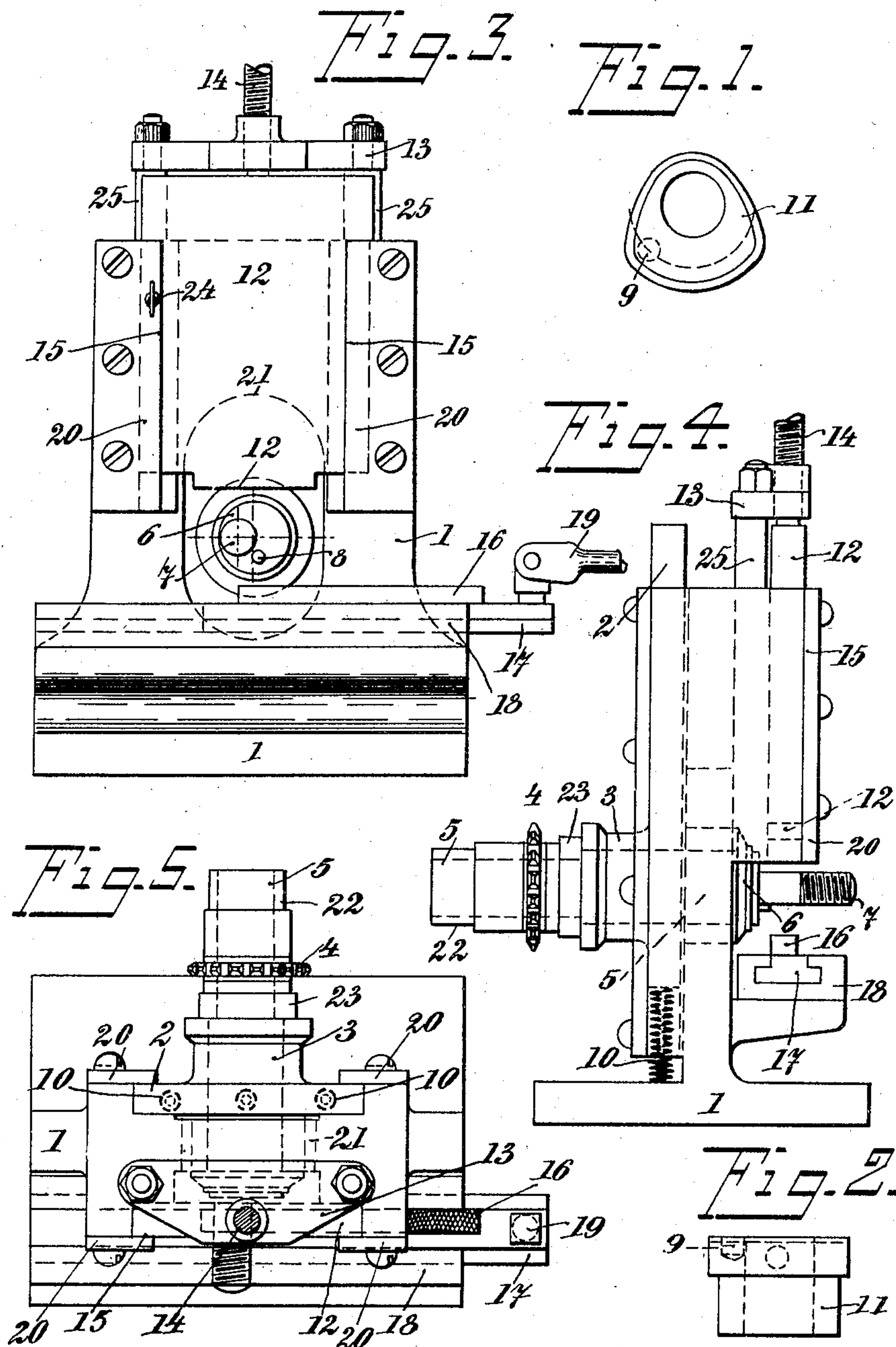


G. MEYER.
CAM FINISHING MACHINE.
APPLICATION FILED APR. 1, 1905.

2 SHEETS—SHEET 1.



Witnesses

W. M. Avery

Walton Harrison

Inventor

Georg Meyer

By

Mumford

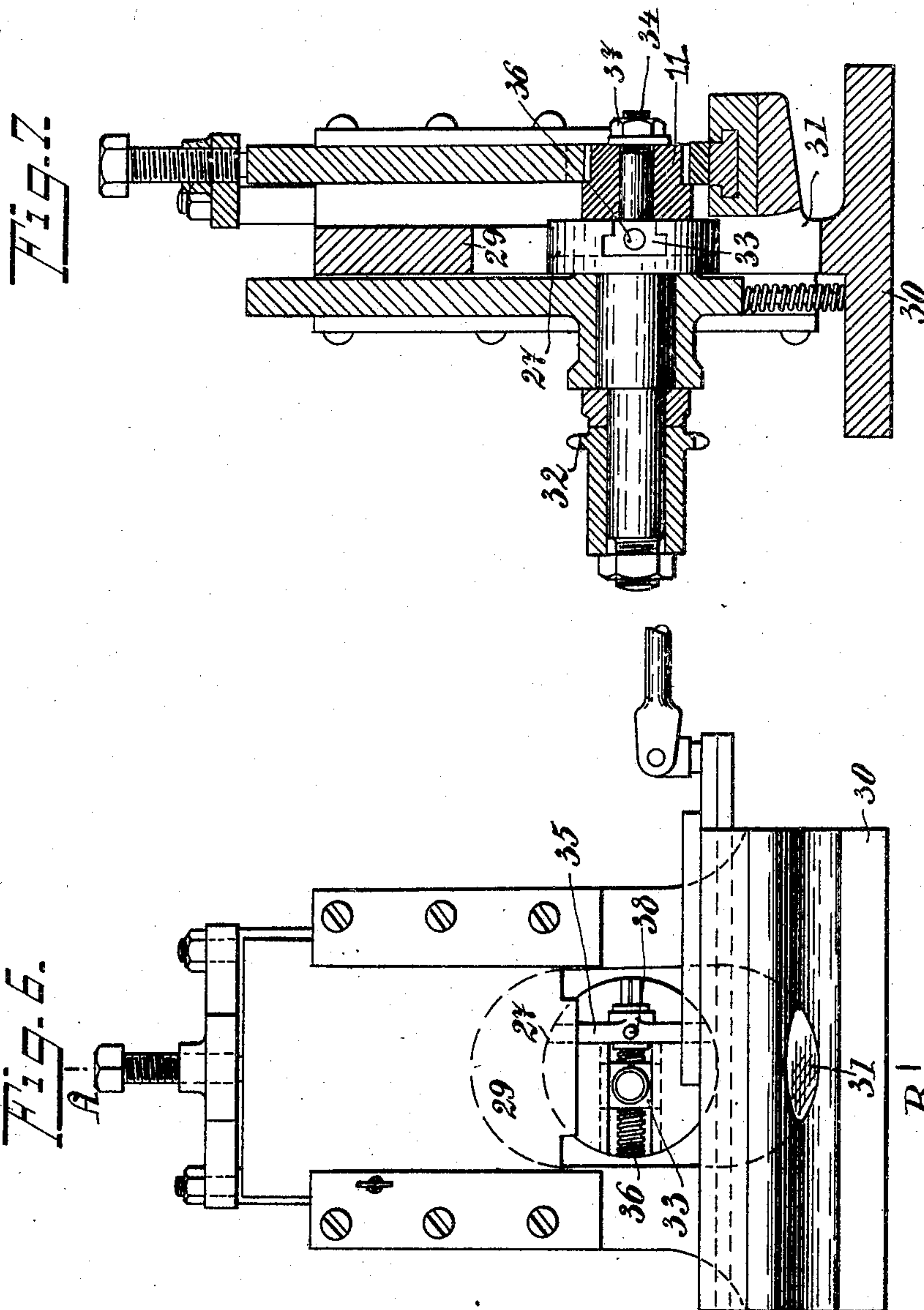
Attorneys

No. 794,530.

PATENTED JULY 11, 1905.

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2 SHEETS—SHEET 2.



WITNESSES
W. M. Avery
Walton Harrison

Inventor
Georg Meyer
By *Wm. D. ...*
Attorneys

UNITED STATES PATENT OFFICE.

GEORG MEYER, OF GRÜNHOF, NEAR STETTIN, GERMANY, ASSIGNOR TO
NÄHMASCHINEN- UND FAHRRÄDER-FABRIK BERNH. STOEWER ACTIEN-
GESELLSCHAFT, OF GRÜNHOF, NEAR STETTIN, GERMANY.

CAM-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 794,530, dated July 11, 1905.

Application filed April 1, 1905. Serial No. 253,309.

To all whom it may concern:

Be it known that I, GEORG MEYER, a citizen of the Empire of Germany, residing at Grünhof, near Stettin, in the Empire of Germany, have invented a new and useful Cam-Finishing Machine, of which the following is a specification.

My invention relates to a machine for finishing, with the aid of a file, cams which have been coarsely worked by a milling-machine or other machine-tool and possess such a shape as to be capable of engaging and sliding in slots with parallel faces. Such cams have an equal diameter in certain directions and are used in many machines—for example, in sewing-machines.

The objects of my invention are, first, to provide a standard or frame with a central lengthy opening; second, to provide on both sides of the frame two slides movable in guides in the longitudinal direction of the central opening; third, to provide the one slide with a bearing which passes through the central lengthy opening; fourth, to provide springs for pressing on this one slide in the one direction; fifth, to provide means for adjusting the other slide in its guides; sixth, to provide a shaft which is mounted to turn in the bearing of the movable slide and is adapted to be driven from without; seventh, to provide the head of the shaft with an eccentric-pin for holding the cam to be finished, which cam is constantly pressed by the springs against the edge of the adjustable slide; eighth, where so preferred to provide means for adjusting the eccentric-pin transversely on the head of the shaft; ninth, to provide a file-slide movable in guides parallel with the edge of the adjustable slide and adapted to support the exchangeable file, and, tenth, to provide means for reciprocating the file-slide. I attain these objects by the machines illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, on an enlarged scale, of a cam to be finished by the machine. Fig. 2 is a side view of the same. Fig. 3 is an elevation of a cam-finishing machine, the cam being omitted. Fig. 4 is a side view of

the same. Fig. 5 is a plan of the same. Fig. 6 is an elevation of a modified cam-finishing machine in which the eccentric-pin is transversely adjustable on the shaft-head; and Fig. 7 is a vertical longitudinal section through the same on the line A B in Fig. 6, a cam to be finished being shown in section.

Similar characters of reference refer to similar parts throughout the several views.

Figs. 1 and 2 show a cam 11 to be finished with the aid of a file on the machine after it has been roughly shaped on a milling-machine or other machine-tool. This cam 11, of a shape frequently found in sewing-machines, is adapted to engage in a slot with parallel faces and to thereby move the respective machine part in which the slot is provided. From an examination of Fig. 1 it will be evident that the sum of the smallest radius above and the largest radius below remains constant during a rotation of the cam 11 through an angle of about ninety degrees in either direction, so that the respective machine part will remain in its lowermost position. The two curves on the right and left sides, which lead from the periphery of the largest radius up to that of the smallest radius, and vice versa, are each curved to a circle the center of which is in the opposite corner of the cam. The consequence of this is that during the rotation of the cam through the following angle of about ninety degrees the cam will move the respective machine part upward, while during the rotation of the cam 11 through a further angle of about ninety degrees the machine part will remain in its uppermost position, whereupon during the rotation of the cam through the last angle of about ninety degrees the cam 11 will move the machine part downward. Hitherto such cams produced on milling-machines or the like required to be finished by hand with the file, which of course is a tedious task and takes much time.

The cam-finishing machine shown at Figs. 3, 4, and 5 comprises a standard or frame 1, which may be secured on a convenient table, support, or the like. On both sides this frame 1 is formed to two guides for the two

slides 2 and 12, and it is provided with four guiding-plates 20, 20 to prevent the two slides from shifting horizontally. The rear slide 2 is supported by several (here three) vertical helical springs 10, which surround suitable studs and are thereby held. The slide 2 is shown as cast in one piece with a bearing 3 projecting on both sides. The frame 1 is provided with a central lengthy opening 21, through which the front part of the bearing 3 passes and in which it can move up and down. A shaft 5 is mounted in the bearing 3 to turn and is provided on its head 6 with an eccentric-pin 7. The latter is adapted to hold the cam 11 to be finished and is provided at the end with a screw-thread for a nut, (not shown,) by means of which the cam 11 can be secured on the pin 7. Preferably the head 6 is provided with a small pin 8, which can engage in a hole 9 of the cam 11 (see Fig. 2) to prevent the latter from turning on the pin 7. On the rear part of the shaft 5 a chain-wheel 4 or the like may be secured by means of a nut 22 and a distance-piece 23 or the like. The front slide 12 is made adjustable in its guide by means of an adjusting-screw 24, so that normally it does not drop. Moreover, two studs 25, 25 are provided on the frame 1 for holding a horizontal plate 13, in which an adjusting-screw 14 is disposed. On a horizontal projection of the standard 1 a convenient guide 18 for a slide 17 is secured. This slide 17 is parallel with the lower end face of the adjustable slide 12 and is adapted for securely holding in any known manner an exchangeable file 16. By means of a suitable connecting-rod 19 the slide 17 may be put into a reciprocating motion from without.

The cam-finishing machine is operated as follows: As already mentioned above, the movable slide 2 is constantly pressed upward by the three helical springs 10, so that the eccentric-pin 7 bears against the lower edge of the adjustable slide 12. It will therefore be necessary to push the movable slide 2 downward before the cam 11 to be finished can be put over the pin 7 and secured by its nut. (Not shown.) A file 16, which may be parallelepipedal, or nearly so, is secured on the slide 17, and the adjustable slide 12 is so adjusted, by means of the two adjusting-screws 14 and 24, as to leave a distance between its lower edge and the top face of the file 16 which is a little less than the diameter of the cam 11 in its roughly-worked condition. Then by means of an endless chain (not shown) the chain-wheel 4 is driven to put the shaft 5 into a rotation, and at the same time by means of the connecting-rod 19 the slide 17 is put into a reciprocating motion, when the file 16 will smooth the periphery of the cam 11. It is evident that by the three springs 10 the cam 11 is constantly pressed against the lower edge of the adjustable slide 12, so that the movable slide 2 is periodically moved up and

down during the rotation of the shaft 5 with the cam 11 by reason of the corners of the latter. The eccentricity of the pin 7 may be so selected as to reduce the vertical reciprocating motion of the movable slide 2 with the shaft 5 to a minimum. The pin 8 on the head 6 of the shaft, which engages in the hole 9 of the cam 11, is very useful, as it prevents the cam 11 from shifting during its rotation. By means of the adjusting-screws 14 and 24 the adjustable slide 12 may be adjusted several times, if so preferred, until the distance between its lower edge and the top face of the file 16 is exactly equal to the diameter of the finished cam 11. When the file ceases to touch the cam 11, the latter will be finished and have the exact shape and size.

The cam finished on this machine will of course be superior to that finished by hand, since the file 16 is mechanically and positively guided.

Where preferred, the eccentric-pin 7 may be made transversely adjustable to reduce to a minimum the vertical reciprocating motion of the movable slide 2 for any cam, so that cams of different sizes may be finished on the same machine.

Figs. 6 and 7 represent a cam-finishing machine of the kind just mentioned. Here the head of the shaft is formed to a disk 27, which is preferably located in the central lengthy opening 29 of the frame 30. This opening 29 is shown as terminating in a hole 31, through which the file-dust is permitted to escape. The chain-wheel 32 is secured on the shaft 28 in substantially the same manner as in the previous machine. The disk 27 is formed to a transverse guide for the head 33 of the pin 34 and is provided with a plate 35 and a screw-spindle 36, which latter is mounted to turn in the plate 35 and serves for adjusting the pin 34. The spindle 36 can be turned by means of a key put over its square end. A cam 11 is shown as secured on the pin 34 with the aid of a nut 37, and it may be prevented from turning in any known manner—for example, by means of a small pin 38 on the plate 35. Otherwise the construction of this machine is the same as before.

The cam-finishing machine may be varied in many respects without deviating from the spirit of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a cam-finishing machine, the combination with a frame, of a movable slide guided therein, a bearing in said movable slide at right angles thereto, a shaft mounted in said bearing to turn and provided with an eccentric-pin which is adapted to hold a cam to be finished, an adjustable slide guided in said frame in same direction as said movable slide, means for adjusting said adjustable slide, springs pressing said movable slide so that the cam or the eccentric-pin of said shaft bears against

the edge of said adjustable slide, a file-slide guided in said frame parallel with the edge of said adjustable slide and adapted to hold an exchangeable file, means for driving said shaft, and means for reciprocating said file-slide.

2. In a cam-finishing machine, the combination with a frame, of a movable slide guided therein, a bearing in said movable slide at right angles thereto, a shaft mounted in said bearing to turn, a transversely-slotted disk on said shaft and provided with a screw-spindle in its slot, a pin engaging with its head said screw-spindle and adapted to hold a cam to be finished, an adjustable slide guided in said frame in same direction as said movable slide, means for adjusting said adjustable slide, springs pressing said movable slide so that said pin or the cam bears against the edge of said adjustable slide, a file-slide guided in said frame parallel with the edge of said adjustable slide and adapted to hold an exchangeable file, means for driving said shaft, and means for reciprocating said file-slide.

3. In a cam-finishing machine, the combination with a frame having a central lengthy opening, of a movable slide guided on one side of said frame, a bearing in said movable slide at right angles thereto, a shaft mounted in said bearing to turn and provided with an eccentric-pin which is adapted to hold a cam to be finished, an adjustable slide guided on the other side of said frame in same direction as said movable slide, means for adjusting said adjustable slide, springs pressing said movable slide so that the cam or the eccentric-pin of said shaft bears against the edge of said ad-

justable slide, a file-slide guided in said frame parallel with the edge of said adjustable slide and adapted to hold an exchangeable file, a chain-wheel on said shaft, and a connecting-rod pivotally connected with said file-slide and adapted to reciprocate same.

4. In a cam-finishing machine, the combination with a frame having a central lengthy opening, of a movable slide guided on one side of said frame, a bearing in said movable slide at right angles thereto, a shaft mounted in said bearing to turn, a disk on said shaft and transversely slotted and located within the central lengthy opening of said frame, a screw-spindle in the slot of said disk, a pin engaging with its head said screw-spindle and adapted to hold a cam to be finished, an adjustable slide guided on the other side of said frame in same direction as said movable slide, means for adjusting said adjustable slide, springs pressing said movable slide so that said pin or the cam bears against the edge of said adjustable slide, a file-slide guided in said frame parallel with the edge of said adjustable slide and adapted to hold an exchangeable file, a chain-wheel on said shaft, and a connecting-rod pivotally connected with said file-slide and adapted to reciprocate same.

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

GEORG MEYER.

Witnesses:

CARL HASMUTT,
R. GEO. MARIAE.