

No. 655,424.

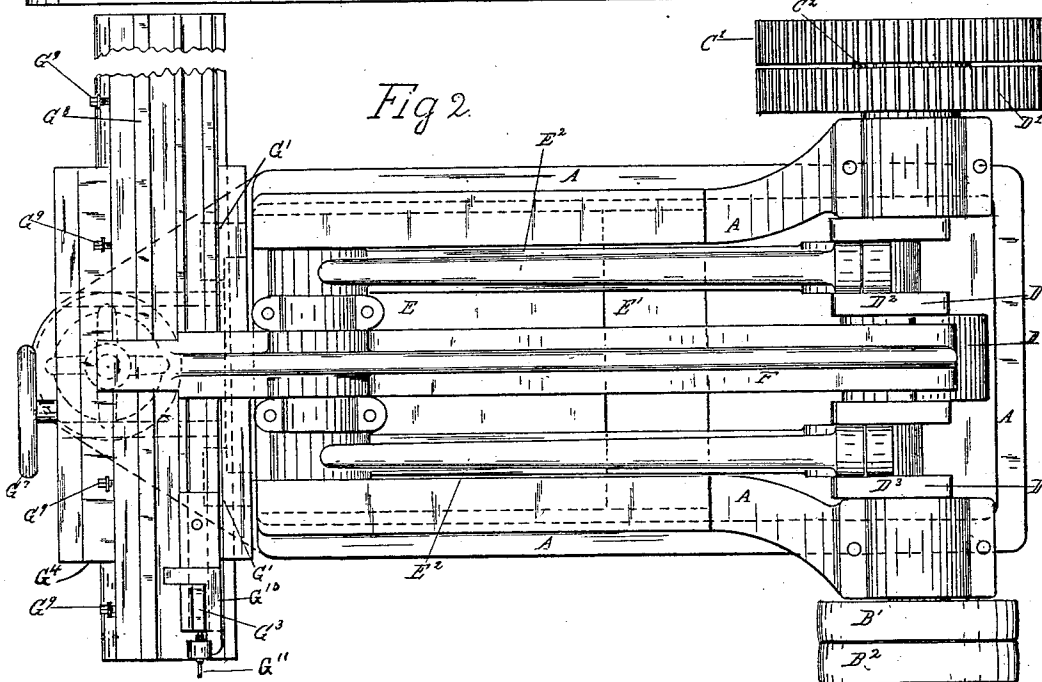
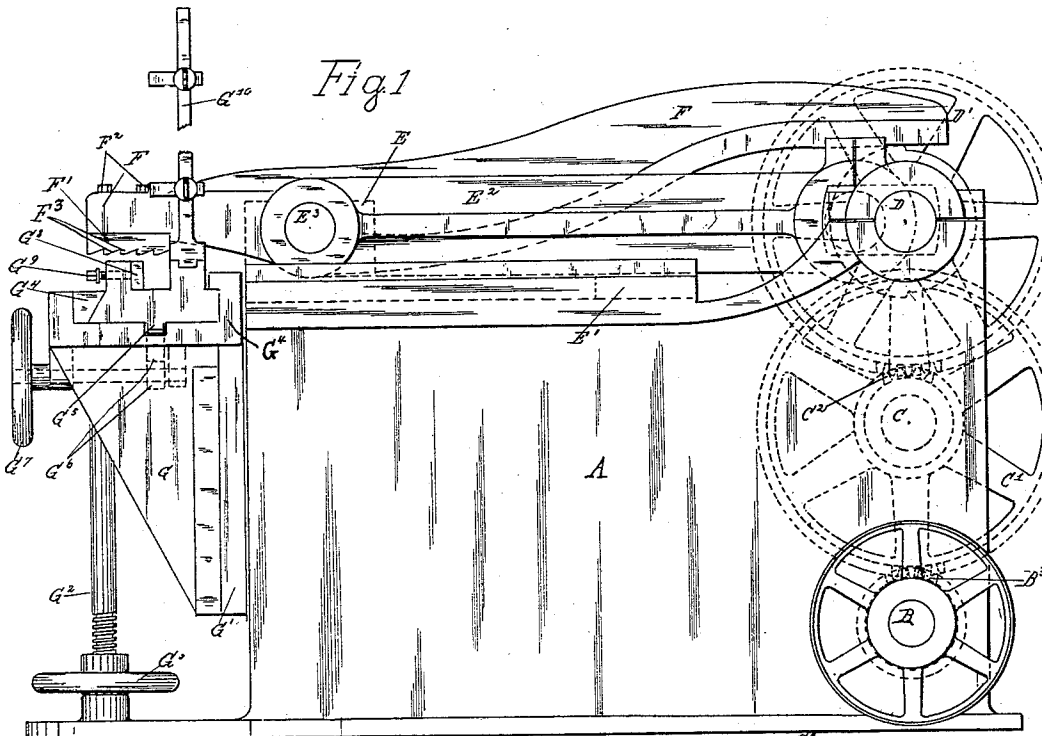
Patented Aug. 7, 1900.

S. J. VERNSTEN.
METAL CUTTING MACHINE.

(Application filed Sept. 22, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
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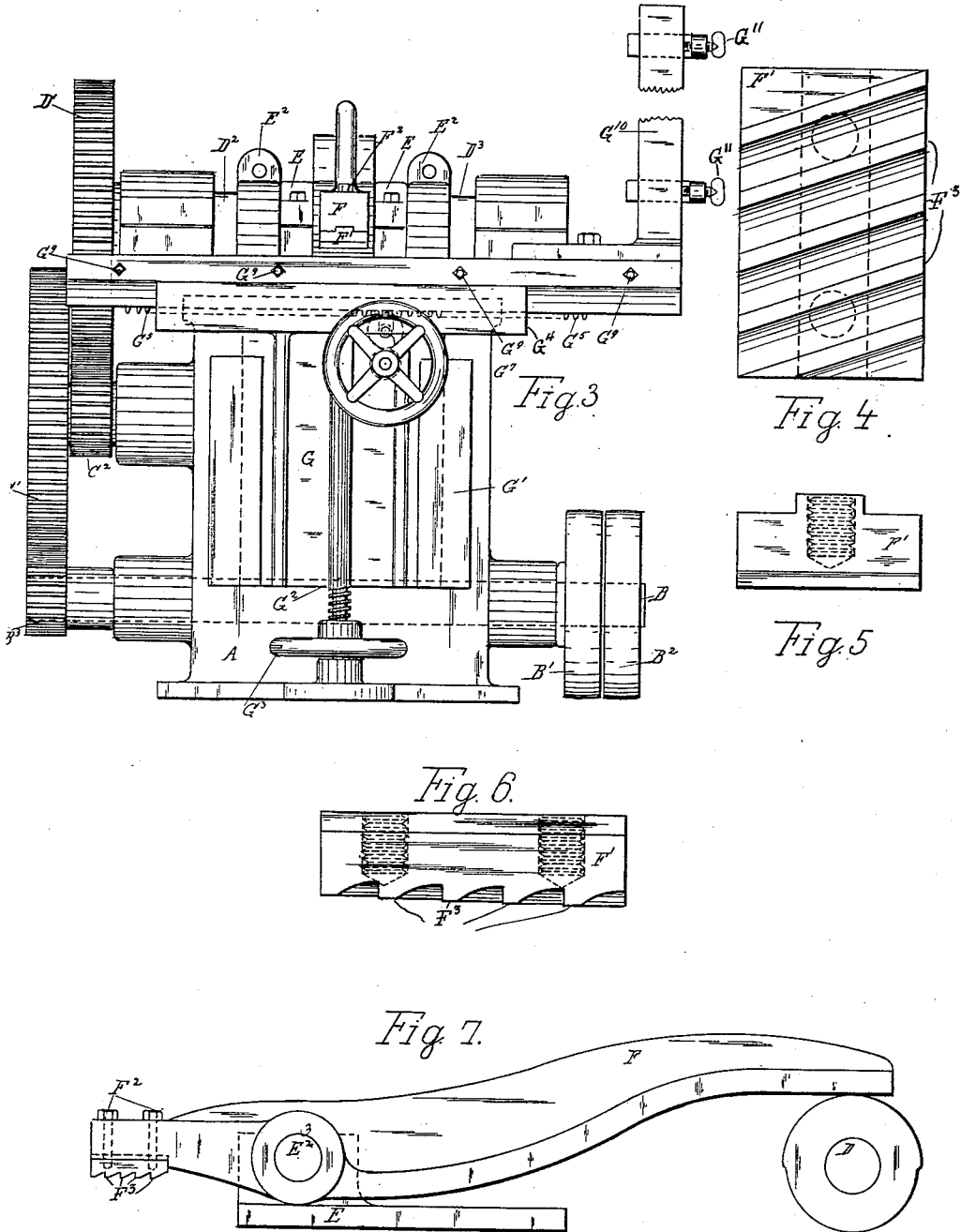
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UNITED STATES PATENT OFFICE.

SWAN J. VERNSTEN, OF CHICAGO, ILLINOIS.

METAL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 655,424, dated August 7, 1900.

Application filed September 22, 1899. Serial No. 731,362. (No model.)

To all whom it may concern:

Be it known that I, SWAN J. VERNSTEN, 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 Metal-Cutting Machines, of which the following is a specification.

The object of this invention is the production of a machine to do that class of work which is now ordinarily done by hand with a file. It is especially adapted for finishing printers' chases and other similar work.

In the accompanying drawings, Figure 1 is a side elevation of this machine. Fig. 2 is a plan view, and Fig. 3 is a front elevation, of the same. Fig. 4 is an under face view of the cutting-tool. Fig. 5 is an end elevation of the same. Fig. 6 is a side elevation of said tool; and Fig. 7 is a side elevation of the tool-bearing arm, showing the relative position of its rocking cam.

Like letters of reference indicate corresponding parts throughout the several views.

In the construction of this machine I provide the body portion A, in the rear lower part of which I journal the drive-shaft B, having the tight and loose pulleys B¹ and B² at one of its ends and the pinion B³ fixed on its opposite end. Directly above the shaft B is an intermediate shaft C, having the gear-wheel C¹ and the pinion C² rigidly mounted thereon.

The crank-shaft D is journaled in the upper part of the machine-body and has the gear-wheel D¹ fixed on said shaft. This gear-wheel meshes with the pinion C² and is therefore rotated by the movement of the tight pulley B¹. The shaft D is provided with the two cranks D² and D³ and has fixed on its longitudinal center the cam D⁴.

A carriage E is mounted on the ways E¹, having a forward-and-back reciprocatory motion on said ways imparted by means of the connecting-rods E², which extend between the shaft E³ and the cranks D² and D³, respectively. The tool-bearing arm F is also pivotally mounted on the shaft E³ near the longitudinal center of said shaft, and extending rearwardly rests upon the surface of the cam D⁴. The peripheral contour of this cam is such that during the forward movement of the tool-bearing arm F the rear end of said

arm is slightly elevated, holding the tool in engagement with the work; but upon the return movement the rear end of said arm is permitted by the form of the cam to descend, raising the tool at the forward end of the arm away from the work. The tool F¹ is secured to the forward end of the tool-bearing arm F in any suitable manner. In this instance I have provided the two machine-screws F² for that purpose. The cutting-face of the tool F¹ is composed of the diagonal teeth F³, each successive tooth from front to rear being a little longer than the preceding tooth of the tool to permit each to cut a chip in the operation of the machine.

G is a table for supporting the work to be operated upon. It is mounted on the vertical ways G¹ and is adapted to be vertically adjusted by means of the threaded shaft G² and the hand-wheel G³ in the usual manner. It is also supported within the transverse guides G⁴, the rack-bar G⁵, with the pinions G⁶, and the hand-wheel G⁷ providing means for the lateral movement or "feed" common in machines of this class. The clamp-bar G⁸, with its set-screws G⁹, and the movable vertical frame G¹⁰, with its setting-screws G¹¹, provide means for clamping the work to be operated upon firmly in position on the table.

In operation work is fastened on the table G and the machine started. The table is raised until the cutting-tool F¹ engages with said work, each forward movement of the tool cutting as many chips from the surface of the work as there are teeth on the face of the tool. The peripheral surface of the cam is so formed that the tool will be held in engagement with the work during the forward movement of the carriage E and the tool-bearing arm F and raised to clear the work upon the return movement of said carriage. The work is fed laterally under the cutting-tool by rotating the hand-wheel G⁷, and raised for another cut, if that is desirable, by turning the hand-wheel G³.

I claim as my invention—

1. In a metal-cutting machine, in combination, a body portion; ways thereon; a carriage on said ways; a tilting tool-bearing arm pivotally mounted on said carriage; a cutting-tool fixed on said arm; a rotatable shaft;

a cam on said shaft, adapted to engage the tool-bearing arm for moving said arm on its pivot to raise the cutting-tool from engagement with the work on the backward stroke of said tool; and means for reciprocating said carriage, which means is independent of the tool-bearing arm.

2. In a metal-cutting machine, in combination, a body portion; ways thereon; a carriage on said ways; a tilting, tool-bearing arm pivotally mounted on said carriage; a cutting-tool fixed on said arm; a cam for engaging said arm and moving it on its pivot, to raise the tool from engagement with the work on the backward stroke of the said tool; a shaft having a crank thereon; and a connecting-rod extending between the crank and said carriage, for reciprocating the latter on said ways.

3. In a metal-cutting machine, in combination, a body portion; ways thereon; a reciprocatory carriage on said ways; a tilting, tool-bearing arm pivotally mounted on said carriage; a cutting-tool fixed on said arm at the forward end thereof; a shaft having a crank thereon; a cam on said shaft for engaging the rear end of said tool-bearing arm, and moving it on its pivot; a connecting-rod extending between the crank and a point of attachment to said carriage; and means for rotating the crank-shaft.

4. In a metal-cutting machine, in combination, a body portion; ways thereon; a reciprocatory carriage on said ways; a tilting, tool-bearing arm pivotally mounted on said carriage; a cutting-tool fixed on said arm at the forward end thereof; a shaft having a crank thereon; a cam on said shaft for engaging the rear end of said tool-bearing arm, and moving it on its pivot; a connecting-rod extending between the crank and a point of attachment to said carriage; means for rotating said crank-shaft; a table for supporting the work to be operated upon; means for adjusting said

table in a vertical direction; and means for laterally moving said table.

5. In a metal-cutting machine, in combination, a body portion; ways thereon; a reciprocatory carriage on said ways; a pivotal shaft fixed on said carriage; a tilting, tool-bearing arm pivotally mounted on said shaft; a cutting-tool fixed on said arm at the forward end thereof; a shaft having a crank thereon; a cam on said shaft for engaging said tool-bearing arm, and moving it on its pivotal support; a connecting-rod extending between the crank and the shaft mounted on said carriage; for reciprocating the latter on said ways; a table for supporting the work to be operated upon; a screw for vertically adjusting the position of said table; and a rack and pinion for moving said table in a lateral direction.

6. In a metal-cutting machine, in combination, a body portion; a driving-shaft rotatably mounted thereon; a crank-shaft having two cranks of equal throw and extending in the same plane; gear-wheels for imparting motion from said driving-shaft to said crank-shaft; horizontal ways on said body portion; a reciprocatory carriage on said ways; a shaft fixed on said carriage; a tool-bearing arm pivotally mounted on said shaft; a cutting-tool fixed on said arm near the forward end thereof; a cam on said crank-shaft for engaging the rear end of said arm, and moving it on its pivot; a connecting-rod extending between each of said cranks and the shaft fixed on said carriage; a table for supporting the work to be operated upon; means for clamping the work to said table; a screw and hand-wheel for vertically adjusting said table; and a rack and pinion for moving said table transversely.

SWAN J. VERNSTEN.

Witnesses:

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