No. 631,884. Patented Aug. 29, 1899.

E. A. WAHLSTRÖM.

MACHINE FOR SHARPENING CUTTING TOOLS OF CUTTERS.

(Application filed Mar. 8, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

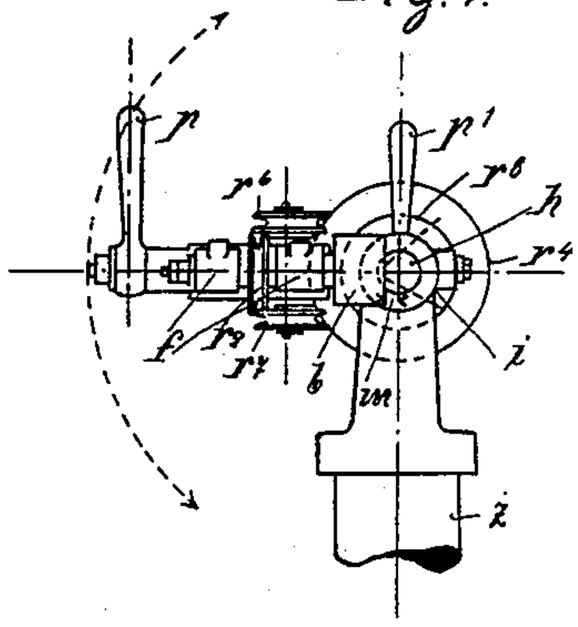

Fig. 2.

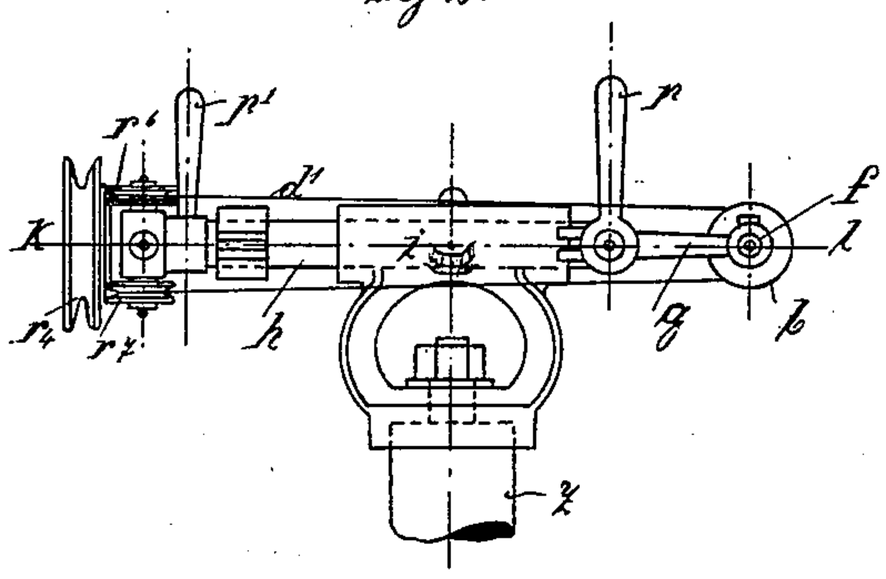

Fig. 7.

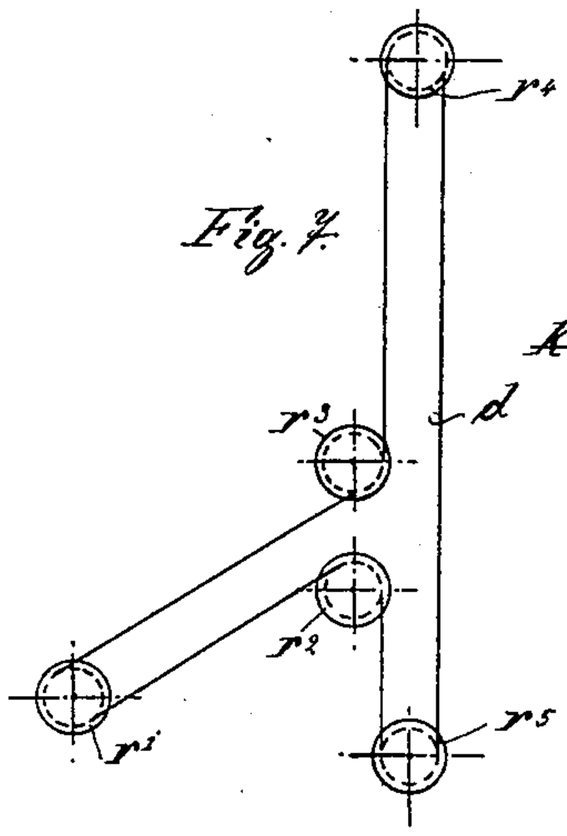

Fig. 3.

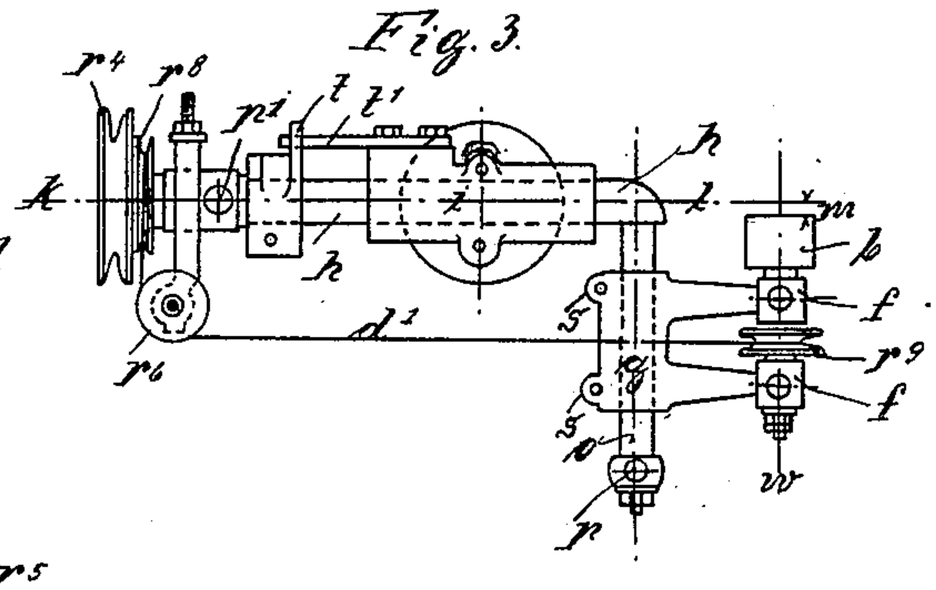

Fig. 4.

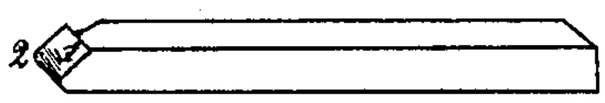

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Fig. 5.

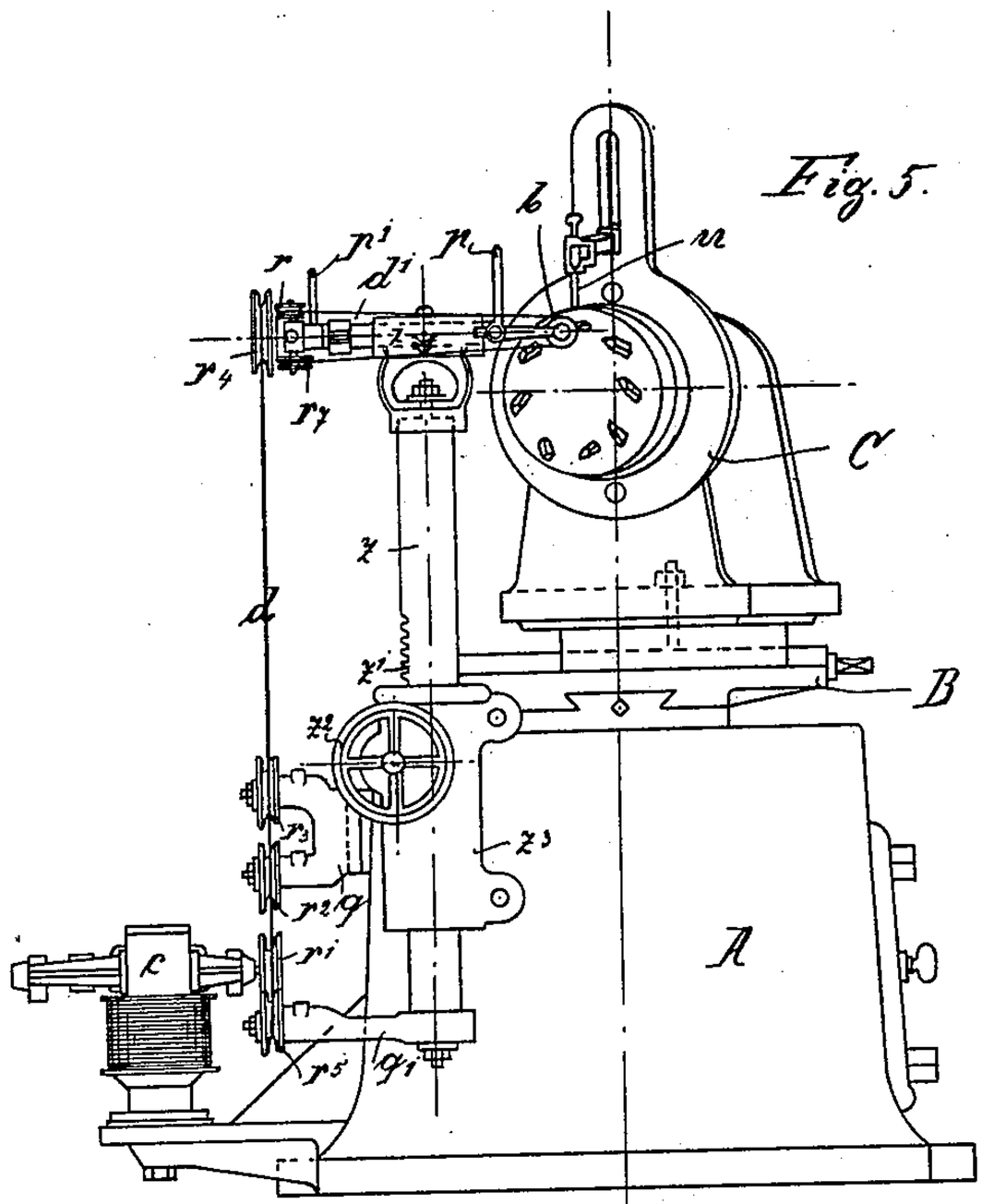
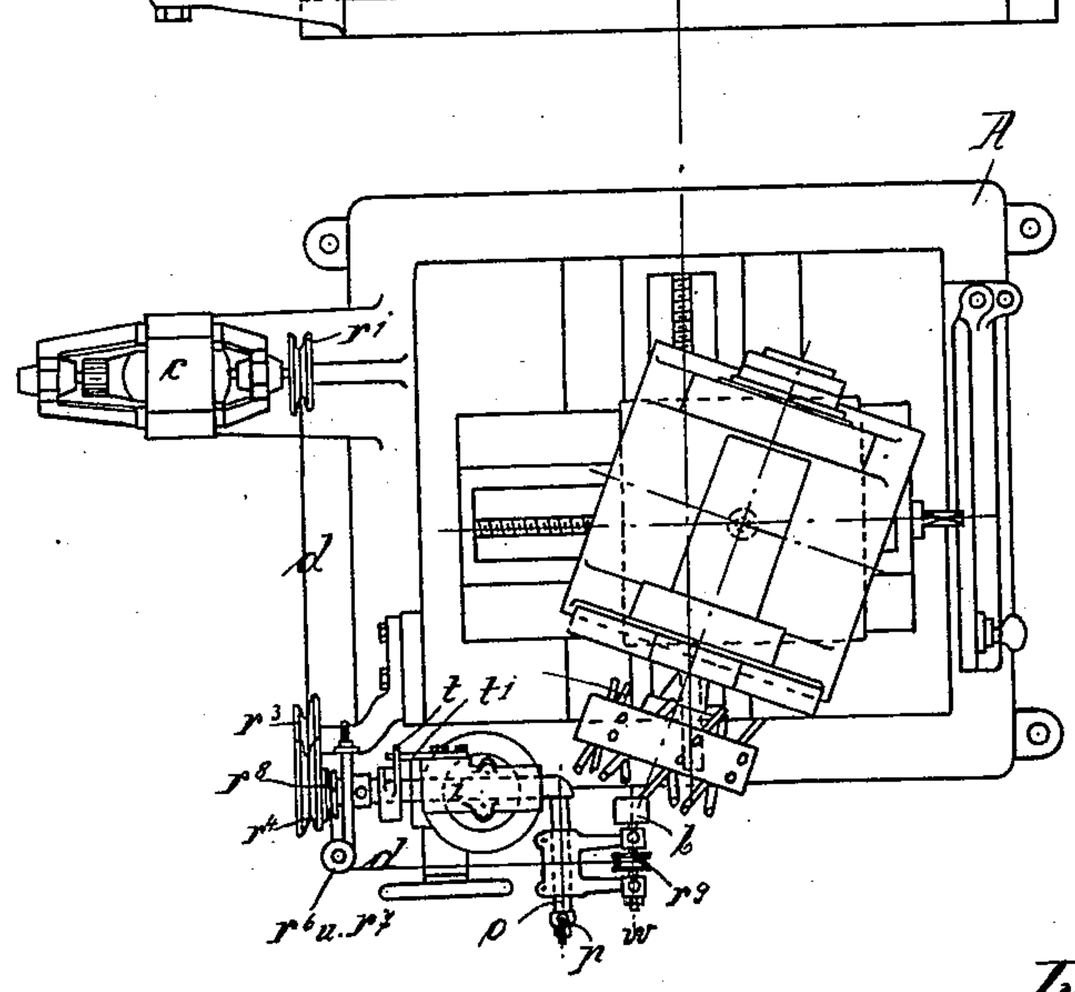


Fig. 6.



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UNITED STATES PATENT OFFICE.

EMIL ALFRED WAHLSTRÖM, OF CANNSTADT, GERMANY.

MACHINE FOR SHARPENING CUTTING-TOOLS OF CUTTERS.

SPECIFICATION forming part of Letters Patent No. 631,884, dated August 29, 1899.

Application filed March 8, 1899. Serial No. 708,262. (No model.)

To all whom it may concern:

Be it known that I, EMIL ALFRED WAHLSTRÖM, a subject of the King of Würtemberg, and a resident of Cannstadt, in the Kingdom of Würtemberg, German Empire, have invented a new and useful Machine for Sharpening the Cutting-Tools of Cutters, (for which application for patent has been filed in Germany on the 20th of August, 1898,) of which the following is an exact specification.

When working with cutting-tools fixed in cutters, a great inconvenience has been found in the fact that the blunt tools could not be sharpened again without being taken out of the cutters. Therefore the tools had to be taken out separately and sharpened. This process was not practicable, because in reëstablishing the cutting-tools in the cutter it never was possible to place them again accurately enough as to obtain a uniform working of all the knives. A consequence of this fact was that the working surface of the cutter was not uniform and that never an exact work could be obtained. If, however, this method was employed and the cutting-tools replaced with certain exactitude, it needed so much time that under circumstances a new tool could have been made during the time on another machine. These circumstances proved so much more inconvenient as a more correct and rapid working than with a cutter in which the cutting-tools are adjusted in a precise manner is not possible. By means of my arrangement the cutting-tools can be sharpened without taking them out of the cutters. The latter may remain in the working machine and my sharpening device may be attached in suitable manner to the frame of the working machine, or the whole cutter is introduced into a sharpening-machine of particular kind. The latter is the case in the construction represented in the annexed drawings.

A characteristic feature of my invention is that I sharpen the cutting-tools with the surface of a rotating sharpening-disk which besides a rotating movement can effect an oscillating movement around an axis from which the sharpening-surface of the disk can be moved to and fro the cutting-tools to be sharpened. In sharpening with the surface of the disk a straight surface is formed on the cutting-tool, while a round surface can be sharpened when the disk is set into oscillating motion. The diameter of the sharpened round surface of a cutting-tool depends from the position of the surface of the sharpening-disk to the axis of oscillation. In my machine I arrange the sharpening-disk in such a way that it can be moved parallel to its working or sharpening surface—*i. e.*, transversely to the axis of rotation. This preferably is done during the sharpening process. Thereby is attained that the working surface not only remains uniform, but also a uniform sharpening of the cutting-tools is assured.

My invention will be better understood with reference to the annexed drawings, in which similar letters denote similar parts throughout the different views, and in which—

Figure 1 shows a side view of my sharpening device; Fig. 2, an elevational view of the same; Fig. 3 a plan view, and Fig. 4 a perspective view, of a sharpened cutting-tool. Fig. 5 is an elevational view of the whole machine; Fig. 6, a plan of the whole machine, and Fig. 7 a plan of the driving mechanism.

A cross-support B is fixed upon the support A. This cross-support B carries a device C, by means of which the cutter is kept in position.

The sharpening device proper, Figs. 1 to 3, is formed by a rotating sharpening-disk *b*, able to oscillate in its direction of axis. This disk *b* is movable in all directions. It is attached upon an arbor *w*, carrying a driving-roller r^9. This driving-roller runs in bearings *f*, supported by the arms of a fork *g*. The fork *g* is adapted to slide upon a shaft *o* and can be fixed in any position by means of the screws *s*. The shaft *o* is provided at its free extremity with a handle *p* and is placed rectangularly to the main shaft *h*. This shaft *h* is rotatably journaled in the bearings *i* and can be moved along its longitudinal direction by means of a handle *p'*. The bearing *i* rotates around a vertical standard *z*. The latter can be raised and lowered in known manner by means of teeth *z'* and a toothed wheel z^2, Fig. 5, and fixed in any position by means of the elastic chuck z^3.

It is evident that the source of power might be any one. In the example represented in the drawings an electromotor *c* is used to drive

the pulley r'. An endless band runs from the pulley r' over the pulley r^3 to the pulley r^4, from there down again to the pulley r^5, over the pulley r^2, and back to r'. The pulleys r^2 and r^3 are secured to the body of the machine in a frame q, while the pulley r^5 is fixed to an arm q' of the vertical shaft z. The pulley r^4 is connected together with a smaller pulley r^8 and rotates around the shaft h. The movements of the pulley r^4 are transmitted by the pulley r^8 and the endless belt to the guide-rollers r^6 and r^7, and consequently to the roller r^9, setting in motion the sharpening-disk b.

The actuation of my machine is as follows: After the cutter, with all its cutting-tools, is brought upon the carrier C the sharpening device, Figs. 1 to 3, is adjusted in height in such a manner that the cutting-tools can be sharpened subsequently one after the other. Therefore it is necessary that the movement of the cutter has to be arrested after one knife has been sharpened. For this purpose I have fixed to the carrier C a stop n, gripping into the holes of the cutter f, thereby preventing the further rotation of the same.

The disk b can exactly be adjusted. The distance between the fore edge m of the disk b and the middle line of the shaft h forms the radius of the circumferences which draws the sharpening-disk, with its fore edge, around each of the cutting-tools. To execute this circular movement, the shaft o is turned around the shaft h by means of the handle p. Evidently the shaft h forms the axis of rotation. This oscillating movement can be determined at one or at both sides by means of suitable stops. In Fig. 3 stop t bears against stop t' of the bearing i. A uniform wear of the disk b is attained by the longitudinal displacement of the shaft h.

In sharpening the straight surface 1 of the cutting-tool the sharpening-disk is moved forward and backward parallel to the shaft $h\ k\ l$. The same is done when sharpening the round surface.

Fig. 4 illustrates a cutting-tool, and it is easy to understand that a straight surface 1 is sharpened when the disk b does not rotate around the shaft $h\ k\ l$, while by swinging the disk b around $k\ l$ the round surface 2 of the knife will be sharpened. The angle of the straight surface 1 in respect to the middle line of the cutting-tool is determined by the stops $t\ t'$; but as the position of these stops can be varied at will (not represented in the drawings) it will be evident that this angle also can vary. A proper adjustment of the cutting-tool can be effected by the cross-support B, rotatably fixed upon the main frame A.

In the construction represented in the drawings it is assumed that the cutter a is employed with a special sharpening-machine. Evidently the cutter may remain in the working machine, and the sharpening device, as represented in Figs. 1 to 3, can be fixed to this machine in suitable manner.

Having thus fully described the nature of this invention, what I desire to secure by Letters Patent of the United States is—

1. In a machine for sharpening the cutting-tools of cutters, the combination with a carrier C holding the tools, a rotatable sharpening-disk b carried by a fork g sliding upon a shaft o and provided with a handle p, a shaft h loosely mounted in a bearing i, rigidly connected to the shaft o and being rectangularly to the same, a standard z carrying the bearing i for the shaft h, a handle p' fixed to the shaft h for swinging around the shafts $h\ o$ and the sharpening-disk, a roller-gearing for rotating the sharpening-disk b, for the purpose and substantially as set forth.

2. In a machine for sharpening the cutting-tools of cutters, the combination of a rotatable sharpening-disk b fixed upon the arms of a movable fork g, with a shaft h rotatably fixed in a bearing i, a rod z supporting said bearing i, driving-rollers effecting the rotation of the sharpening-disk and means to swing the disk b with the fork g around the axis $k\ l$ of the shaft h, for the purpose and substantially as described.

3. In a machine for sharpening the cutting-tools of cutters, the combination of a movable shaft h rotatably fixed in a bearing i with a shaft o rigidly connected to the shaft h rectangularly to the same, a fork g, adapted to slide upon the shaft o, screws s fixing the fork g to said shaft o, a shaft w rotating in bearings f supported by the arms of the fork, a sharpening-disk m fixed to the extremity of the shaft w and means to give motion to the sharpening-disk, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EMIL ALFRED WAHLSTRÖM.

Witnesses:
WM. HAHN,
H. WAGNER.