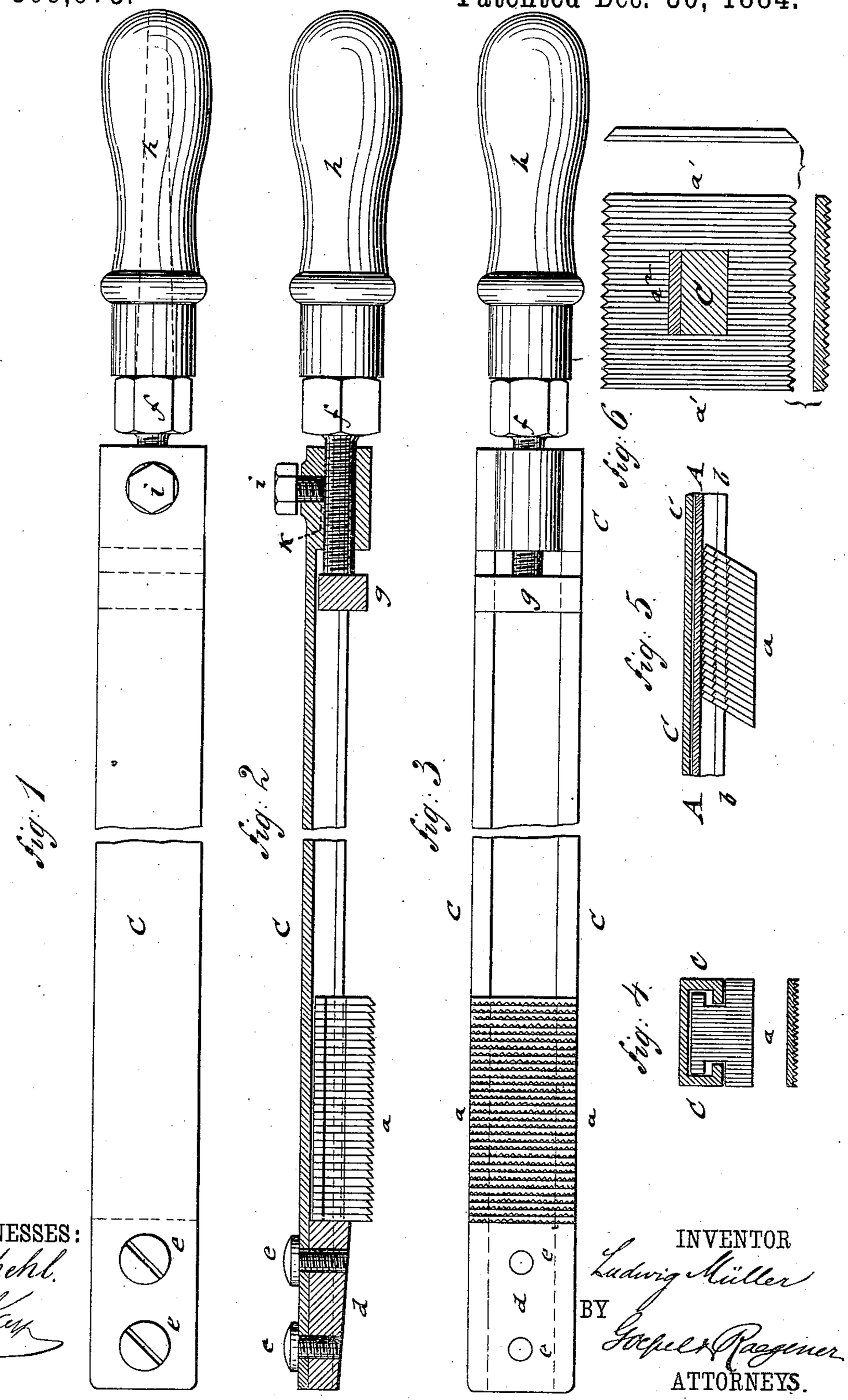
(No Model.)

L. MÜLLER.

FILE.

No. 309,973. Patented Dec. 30, 1884.



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FILE.

SPECIFICATION forming part of Letters Patent No. 309,973, dated December 30, 1884.

Application filed November 7, 1884. (No model.) Patented in Germany January 1, 1884, No. 27,846; in Belgium May 30, 1884, No. 65,329, and in Austria-Hungary July 30, 1884, No. 20,574 and No. 34,261.

To all whom it may concern:

Be it known that I, LUDWIG MÜLLER, of Dresden, in the Kingdom of Saxony and Empire of Germany, have invented certain new and useful Improvements in Files, (for which Letters Patent have heretofore been issued to me by the following governments: Germany, No. 27,846, dated January 1, 1884; Belgium, No. 65,329, dated May 30, 1884, and Austria-Hungary, No. 20,574 and No. 34,261, dated July 30, 1884,) of which the following is a specification.

The invention relates to an improved construction of files, the teeth of which can be conveniently sharpened without tempering on the surface of a grindstone; and the invention consists of a file composed of a series of recessed steel plates or teeth, which are secured by clamps in a supporting-frame having inwardly-projecting side flanges. For sharpening the cutting-edges of the teeth, the same are placed in an inclined position to the frame, and locked in this position by an interposed steel plate or other suitable means, so as to be applied to a grindstone.

In the accompanying drawings, Figure 1 represents a plan, Fig. 2 a vertical longitudinal section, Fig. 3 a bottom view, and Fig. 4, a vertical transverse section, of my improved file. Fig. 5 is a vertical longitudinal section showing the method of setting the teeth for sharpening the same, and Fig. 6 is a vertical transverse section of a file with double teeth or plates.

Similar letters of reference indicate corresponding parts.

In the drawings, C represents the supporting-frame of my file, which is made of U-shaped cross-section, and provided with inwardly-extending flanges *b b*. A series of steel plates or teeth, *a a*, are supported by the frame C, and provided at one side with vertical ribs, as shown clearly in Fig. 4. The steel plates or teeth *a a* have recesses at their opposite edges, said recesses being somewhat larger in size than the flanges *b b* of the supporting-frame C, so that the steel plates or teeth can be easily inserted at the outer end of the frame and moved into position along the flanges *b b*. In inserting the teeth the ribbed side should face the outer end. When the required number of teeth or plates have been inserted, the frame C is closed at the outer end by a strong cheek, *d*, which is attached by fastening-screws *c e*. The steel plates or teeth are then firmly clamped to the frame C by means of a screw, *f*, that is secured by a ferrule into a handle, *h*, said screw having a cross-head, *g*, at its outer end, that is guided in the frame, so as to press the steel plates or teeth firmly together.

To prevent the loosening of the clamping-screw *f*, a set-screw, *i*, is used, that presses a copper plate, *k*, tightly against the threads of the screw *f*, as shown in Fig. 2.

For sharpening the plates or teeth *a a*, the end cheek, *d*, is removed and the plates placed in inclined position to the frame C, which is possible by means of the larger size of the side recesses of the same. The upper ends of the steel plates or teeth are thereby placed at some distance from the transverse portion of the frame C, so as to admit the insertion of a steel plate, A, which serves to hold the steel plates or teeth in inclined position in the frame C. The cutting-edges of the teeth are placed by the change of position into one plane, so that they can be readily sharpened on the grindstone while held in position by the plate A. When the grinding of the lower edge is completed, the steel plate A is removed, and the teeth *a a* are returned into a position at right angles to the supporting-frame C, and clamped by means of the cheek *d* and clamping-screw *f*, as before described. When double teeth *a a* are used, as shown in Fig. 6, the same are centrally recessed and placed on a center frame or stock, to which they are secured by a key or feather, *a'*. When this key is removed, the teeth can be set and locked into inclined position to the stock, for being sharpened at both cutting-edges on the grindstone, in the same manner as before described. It will thus be seen that the sharpening of the teeth of the file gives but little trouble, as it requires sim-

ply the change of position of the teeth from a position at right angles to the frame to an inclined position thereto and back again to the former position. The temper and the hardness of the teeth are thereby retained and a very effective file obtained for use in the arts.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the supporting-frame C, having inwardly-projecting flanges, a series of steel plates or teeth having side recesses, and means for clamping the teeth in the supporting-frame, substantially as set forth.

2. The combination of the supporting-frame C, having inwardly-projecting flanges, a series of steel plates or teeth having side recesses, a detachable cheek, *d*, secured to the outer end, and clamping-screw *f*, having a cross-head, *g*, arranged at the opposite end of the frame, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

LUDWIG MÜLLER.

Witnesses:

WILHELM WIESENHÜTTER,

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