

W. T. NICHOLSON.  
FILES.

No. 177,070.

Patented May 9, 1876.



FIG. 1.

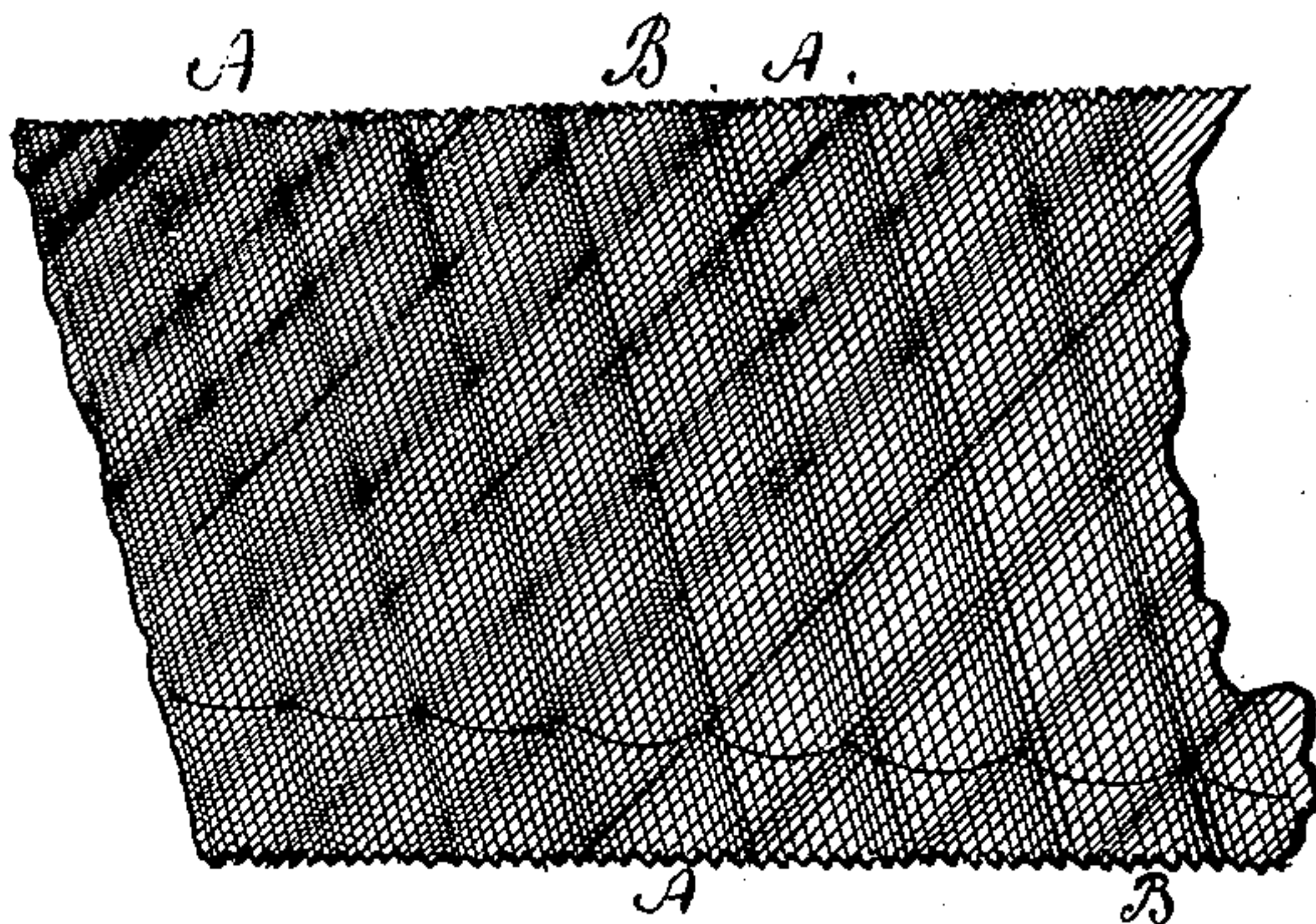


Fig. 2.

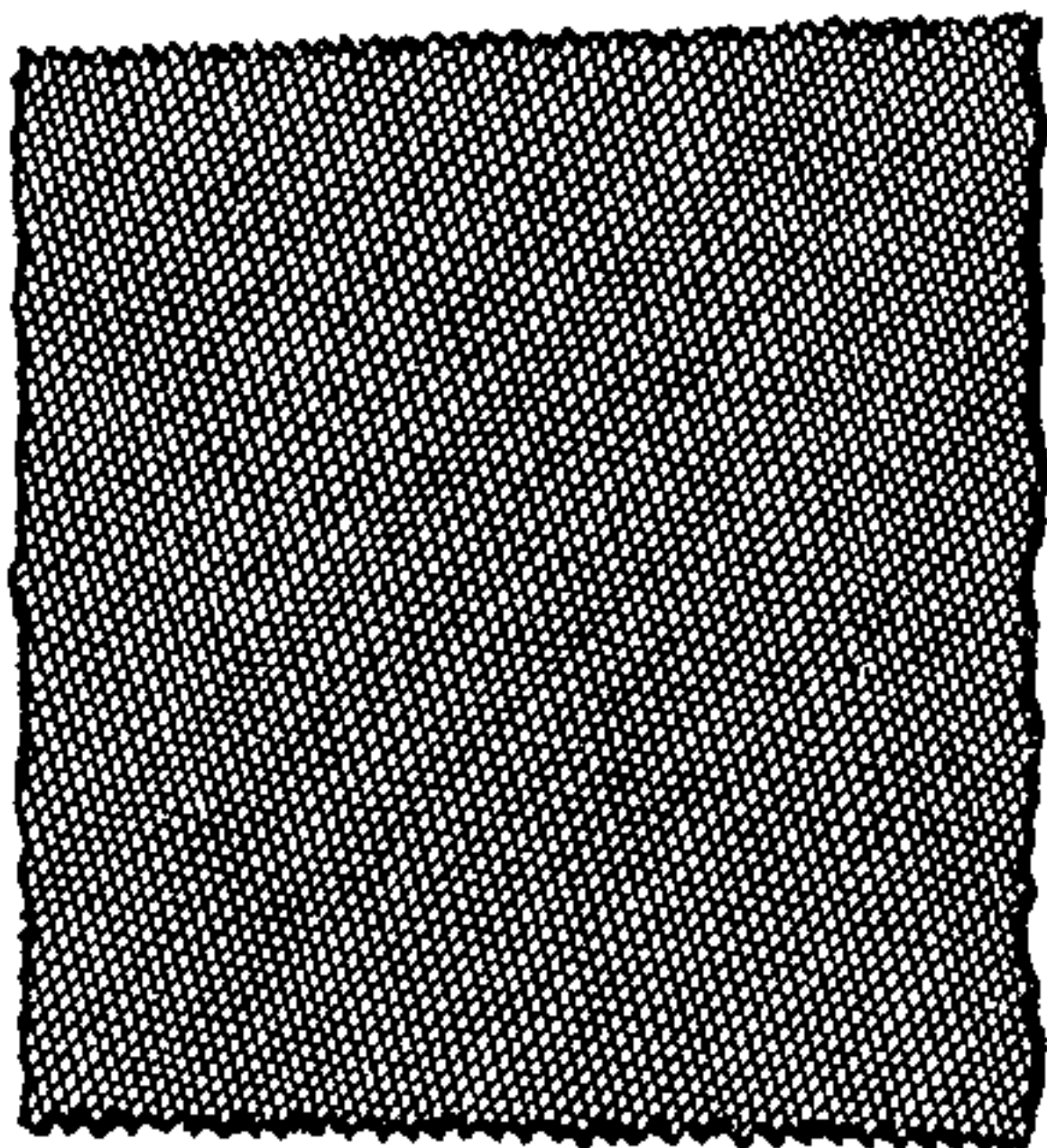


FIG. 3.

WITNESSES.

INVENTOR.

*Handwritten signature: J. C. B. Woods.*



FIG. 4.

*Handwritten signature: William T. Nicholson*



# UNITED STATES PATENT OFFICE

WILLIAM T. NICHOLSON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO  
NICHOLSON FILE COMPANY, OF SAME PLACE.

## IMPROVEMENT IN FILES.

Specification forming part of Letters Patent No. **177,070**, dated May 9, 1876; application filed  
December 16, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM T. NICHOLSON, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Files; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

The file hereinafter described is an improvement upon the one for which Letters Patent were granted to me, dated September 27, 1864, and numbered 44,443. The successive rows of teeth of a file described in said patent, which is thicker near the middle of its length than at the tip and heel, will be separated from each other by lands or spaces, which regularly and progressively increase in width from the tip toward the middle, and as regularly decrease in width from near the middle toward the heel, the characteristic feature of said file being that the longitudinal lines of teeth, instead of being regularly aligned, as they would be if the successive rows were of equal distances apart, will diverge from the heel toward the middle, and then converge toward the tip, if the file is made with its teeth coarser at the middle than at the ends, and will converge from heel to tip if the file is made with its teeth progressing from fine to coarser from the tip toward the heel.

My invention consists in arranging the teeth of a file of the general character above described in groups from tip to heel, the rows of teeth of each group being spaced relatively to each other, with variations, according to a regular ratio of increase and decrease, and modifying what would otherwise be the law of their spacing if the file had its teeth arranged as described in my said patent above referred to, and yet having the spaces between the teeth of each successive group relatively wider or narrower, as the case may be, than the spaces between the teeth of the preceding group.

A file containing my invention is illustrated at Figure 2 of the drawings, in which the

teeth are shown arranged in groups A B, the spaces between the teeth of each succeeding group, from tip to heel, being relatively wider or narrower, as the case may be, than the spaces between the teeth of the preceding group, while, at the same time, the teeth composing each group are spaced relatively to each other, according to a fixed ratio of increase or decrease. The wave-line in Fig. 2 embraces within each curve one of the groups of teeth, and illustrates the gradually-increased space occupied by the groups. Figs. 3 and 4 represent a file of common construction, and the difference between the appearance of such file and one containing my improvement is obvious from the drawings.

The improved file above described, whether it be a crosscut or a float file, possesses advantages as a tool for dressing metal which distinguish it from any file heretofore made. Suitable machinery for producing such files is shown and described in another application for Letters Patent for an improved machine for cutting files, of even date herewith, to which reference may be had; but I wish it to be understood that I claim the novel characteristics of the file described, whether made by said described machinery or by other machinery adequate to produce substantially the same product.

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

A file whose rows of teeth from tip to heel are arranged in groups, the rows of teeth of each group being spaced, relatively to each other, variably, according to a fixed ratio of increase and decrease, and also having the spacing of the teeth of each group in succession, from tip to heel, relatively wider or narrower, as the case may be, than the spacings between the teeth of the preceding or the succeeding group, substantially as specified.

WM. T. NICHOLSON.

Witnesses:

FRANK J. ARNOLD,  
J. C. B. WOOD.