W. T. NICHOLSON.

FILES.

No. 187,298. Patented Feb. 13, 1877.

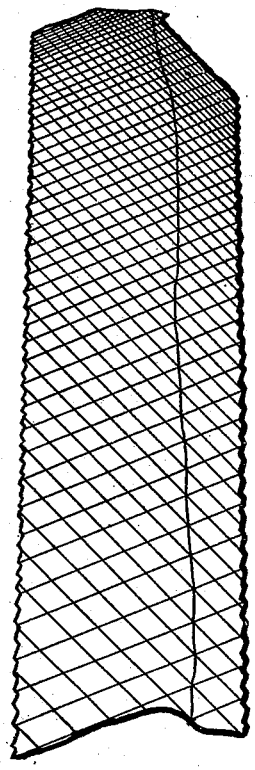

FIG. 1.

WITNESSES.

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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. **187,298**, dated February 13, 1877; application filed March 25, 1876.

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 described in my said above-mentioned patent so that an element of irregularity and uncertainty within defined limits shall be introduced into their spacing slightly in excess of or in diminution of what would otherwise be their spacing, without, however, depriving the file, as a whole, of the characteristics of having its rows of teeth relatively farther apart from the tip toward the middle, and relatively nearer together from near the middle toward the heel, or, if the kind of file requires it, progressively farther apart from the tip toward the heel.

A file containing my invention is illustrated in the drawing, wherein the teeth are shown irregularly spaced within certain defined limits, while the file, as a whole, has the characteristic of having its rows of teeth relatively further apart from the tip toward the middle and relatively nearer together from near the middle toward the heel, or, if the kind of file requires it, progressively farther apart from the tip toward the heel.

A file possessing this peculiarity of arrangement of teeth is produced by one of the modifications of the machine described in an application for Letters Patent for improvements in machinery for cutting files, filed in the Patent Office, December 16, 1875, to which, for the particular construction of the machine, reference may be had.

In the machine referred to a variable progressive movement is given to the file-bed by means of a worm-screw, which engages with the teeth of a worm-wheel, the latter being set eccentrically upon the shaft whose revolution causes the file-bed bearing the blank to be cut to travel underneath the cutting-chisel. This eccentricity of the worm-wheel, notwithstanding that its periphery may have a regular rate of movement, causes the file-bed to have a variable movement due to the degree of such eccentricity, whereby the rows of teeth from tip to heel are spaced relatively farther apart from the tip toward the middle, and relatively nearer together from near the middle toward the heel, or progressively farther apart from the tip toward the heel, depending upon the setting of the eccentric-wheel upon its shaft.

The worm-screw in the said described machine is arranged to have a variable endwise movement within defined limits by means of a cam composed of disks, each of which disks or sectional cams is free to revolve independently on a common shaft, and take any position relatively to the others which chance may determine, whereby the figure of the cam is ever varying within the maximum and minimum limits of its aggregated members. The result is that the otherwise regular increment or decrement of movement of the file-bed, due to the eccentric-wheel, is modified by the variably accelerated or retarded movement, which the rambling cam occasions by its giving an uncertain endwise movement to the worm-screw, and a file is produced whose teeth are generally spaced from tip to heel,

according to the general law of the action of the eccentric worm-wheel, but in which the spacings between the teeth are measurably uncertain instead of increasing or decreasing, according to some fixed ratio.

The improved file above described, whether it be a cross-cut or a float file, possesses advantages as a tool for dressing metal, which distinguishes it from any file heretofore made. No two files cut by the machine which I have referred to, as adapted to produce such files, are identical, in the sense that an imprint taken from one will correspond exactly with an imprint taken from any other, but all are alike in the characteristic that, to the spacing of the teeth from tip to heel, according to a general fixed law of increase or of decrease, there is superadded the uncertain disposition of such teeth as to their spacings within fixed limits of variation sufficient to break up any absolute uniformity of arrangement.

I wish it to be understood that, while the machinery which I have described in my said application above referred to is capable of producing the same file herein described, I claim a file having such novel characteristics, whether made by said described machinery or by other machinery organized to produce substantially the same product.

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

A file whose rows of teeth, from tip to heel, are spaced generally upon the principle of being relatively farther apart from the tip toward the middle, and relatively nearer together from near the middle toward the heel, or progressively farther apart from the tip toward the heel, but in which the above-described characteristic spacing is modified by an uncertain increment or decrement of spacing within fixed limits of variation, sufficient to prevent any absolute uniformity of arrangement of the teeth.

W. T. NICHOLSON.

Witnesses:
JOHN D. THURSTON,
J. C. B. WOODS.