

J. GARLAND.

MACHINES FOR TESTING FILES AND STEEL.

No. 170,166.

Patented Nov. 23, 1875.

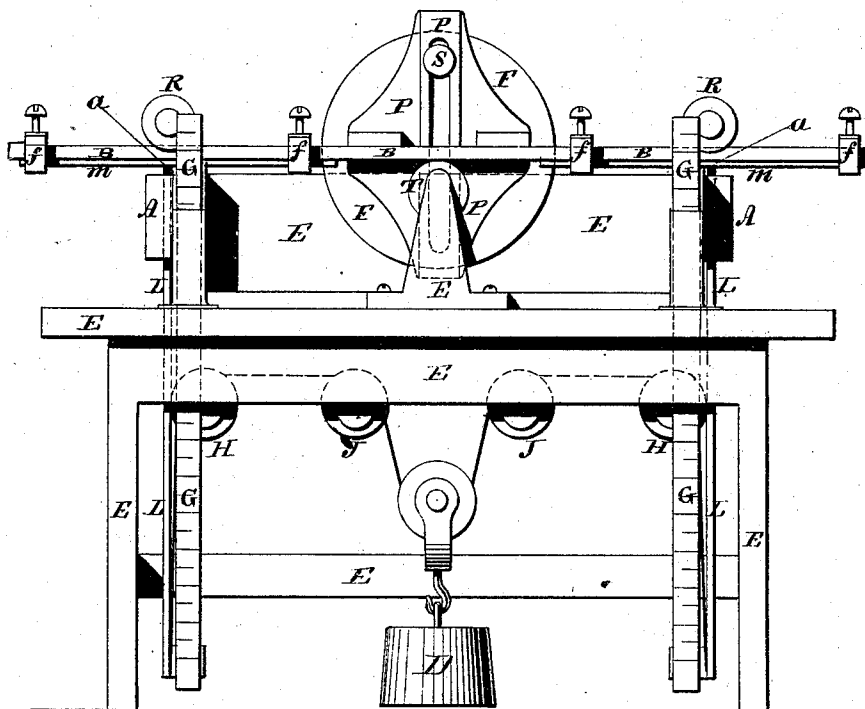


FIG. 1.

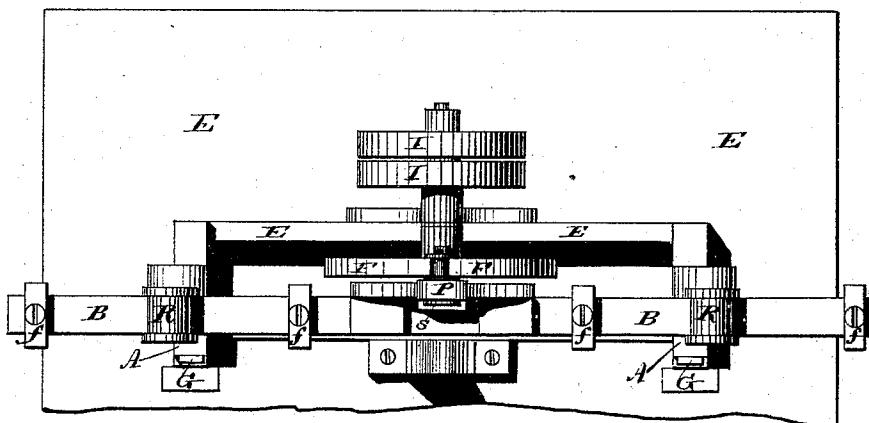


FIG. 2.



FIG. 3.

WITNESSES.

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IMPROVEMENT IN MACHINES FOR TESTING FILES AND STEEL.

Specification forming part of Letters Patent No. **170,166**, dated November 23, 1875; application filed April 7, 1875.

To all whom it may concern:

Be it known that I, JAMES GARLAND, of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and useful Machine for Testing Files and Steel, of which the following is a specification, referring to the accompanying drawing making part of the same, in which—

Figure 1 is a front elevation of my said machine. Fig. 2 is a plan or top view of the same. Fig. 3 is a view of the under side of the file-bar.

Similar letters mark like parts in all the figures.

My invention relates to the employment of mechanism to determine the character and practical value of files and steel for the manufacture of the same, and other purposes; and the invention consists in combining a filing mechanism, capable of operating two files at a time, with means for holding two equal pieces of steel, one against each file, with an equal pressure continuously, in such a manner that the two files and the two pieces of steel will be subjected to a similar action and usage, in all particulars corresponding with the practical use of the file upon metal, so that a comparison may be instituted between the two files as to their several qualities of cut, hardness, and durability, and as to the uniformity or fineness of grain, the toughness, or other quality of steel, by filing the two pieces with two files of the same ascertained quality, or by interchanging the two files; the object being to ascertain by absolute trial the relative value in different respects of any two files, and the nature and value of steel for different purposes, in the same way.

In the drawing, the filing mechanism mentioned consists of a horizontal bar, B, attached to the slotted plate P, which is connected by the stud-pin S to the crank-plate F on the driving-shaft, which, by rotation, transmits a reciprocating movement to the bar B endwise. The said bar is mounted and bears against the cylindrical surface of two flanged rollers, R R, on its upper surface, near the two ends, and there is another roller, T, near the middle of the bar, which affords a bearing and support beneath it. These rollers, besides affording suitable anti-friction bearings, also keep

the bar in line, and enable it to slide freely with a steady and uniform stroke. To each end of the bar, on the under side, a file, M, is firmly secured by screw-binders *f* or other suitable means. Beneath the two files, and in line with the rollers R R, two metal-holders, A A, are arranged, and either firmly secured to, or forming part of, the table or frame of the machine; and each of said holders is provided with a vertical opening through its center for the reception of a bar of steel, L, of corresponding size and form, as shown in Fig. 1, which bears endwise against the surface of each file at *a*, the opening through said holders being sufficiently roomy to permit the steel to slide freely therein upward against the files by the application of suitable pressure thereto by means of the equalizing-weight D and the cord passing over the two sets of pulleys H H and J J, which, it will be seen, exerts an equal pressure on both bars, to the lower ends of which the two ends of the cord is attached. A graduated indicator, G, is also attached to, and moves upward with, the two steel bars, by which to note, by a suitable index or pointer, the reduction of the length of each bar by the said filing operation, which is going on at its upper end.

The whole apparatus being properly mounted in a frame, E, the operation is as follows, viz: Two files, which may be of different grades of material, or of different manufacture, or one cut by hand and the other by machinery, &c., are secured to the opposite ends of the bar B, as shown in Figs. 1 and 3. Then a bar of steel is broken in two in the middle, and the two ends formed by the breaking inserted in the holders A against the two files, after which the lower ends of the two bars are connected by the cord to the weight D, when the machine is started by the rotation of the crank F by a band running over the pulleys I I, with the effect to produce an equal mechanical stroke forward and backward with each file upon the corresponding pieces or surfaces of the two parts of the same bar of steel, with precisely the same pressure upon each file, the result being that the superiority of cutting will be determined by that file reducing the steel more rapidly than the other in a given time, as will be shown unmistakably by

the two indicators G. The best-hardened file will be determined by the freedom of the teeth from breaking, unless too hard, or the flattening at the edges if too soft, or their continued good order under severe and continued use if properly hardened, which also determines the relative durability of the files in cutting for a given length of time under the same circumstances.

These results, which can be accurately arrived at by means of this machine, make it of great value, because it enables the manufacturer to select the kind of steel which is best adapted to the different kinds of files he is making, according to their use. It also enables the cutter, either by hand or machine, to determine the relative utility of different depths or inclination of cutting; and, also, enables the person having charge of the hardening process, which is, perhaps, the most difficult to conduct with the requisite uniformity, to determine by the result of one process the correct degree of hardness, from which he will be able to conduct subsequent operations with success.

Having described my invention, I claim—

1. The combination of the filing mechanism, in which two files can be operated at a time, and a holder, for holding a piece of metal, with suitable means for pressing or feeding the same equally against each file during the operation, substantially as described.

2. The indicator G, in combination with the metal-holders A A and a suitable pressing or feeding device, as described.

3. In a file and steel testing machine, the combination of the following instrumentalities: A reciprocating file-holder, an automatic device for holding the steel against the reciprocating file, and an indicator for recording the amount of work done, the whole operating together substantially as and for the purpose described.

JAMES GARLAND.

Witnesses:

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