S. J. McDONALD.

MACHINES FOR PUNCHING AND SHEARING METALS.

No. 179,586. Patented July 4, 1876.

Fig 1

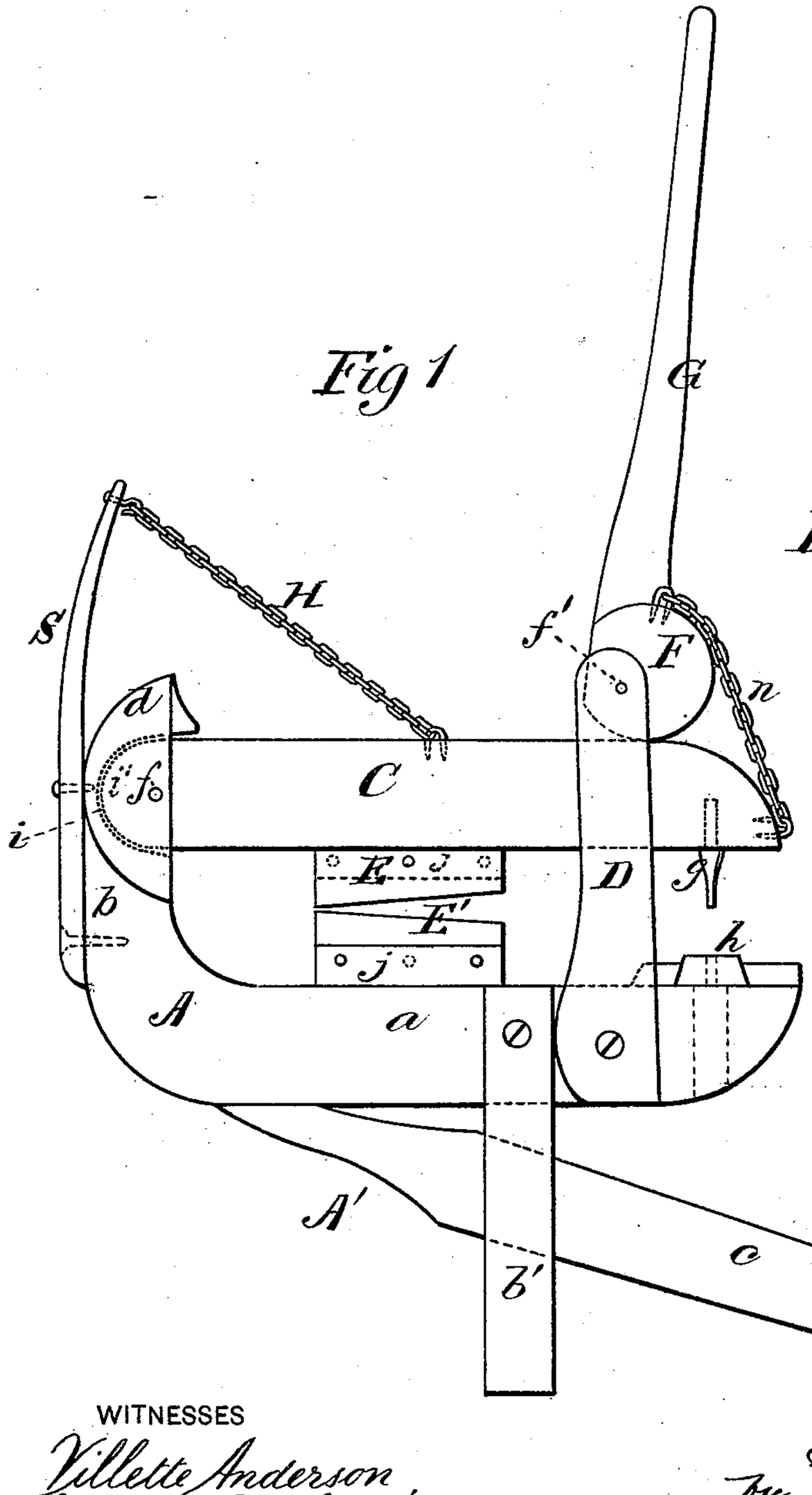
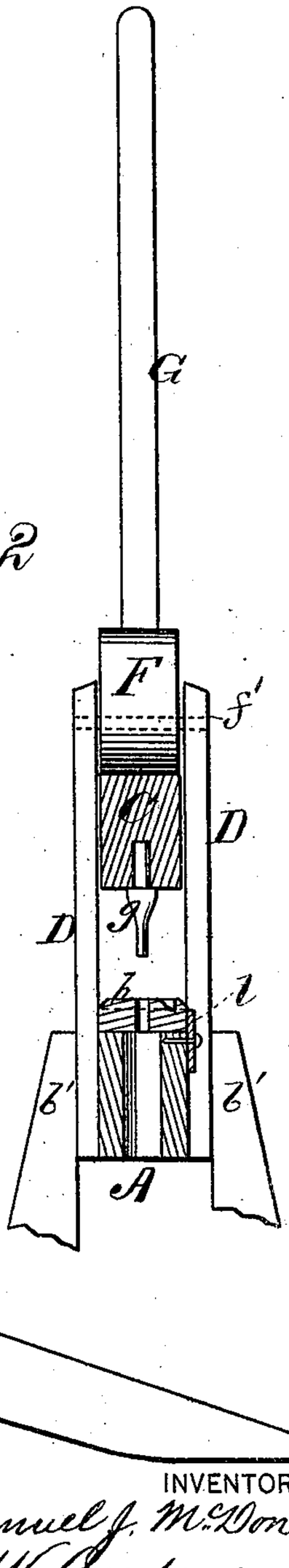


Fig 2



WITNESSES

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SAMUEL J. McDONALD, OF GALLATIN, MISSOURI.

IMPROVEMENT IN MACHINES FOR PUNCHING AND SHEARING METALS.

Specification forming part of Letters Patent No. **179,586**, dated July 4, 1876; application filed May 11, 1876.

To all whom it may concern:

Be it known that I, SAMUEL J. McDONALD, of Gallatin, in the county of Daviess and State of Missouri, have invented a new and valuable Improvement in Shearing and Punching Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a side view of my improved punching and shearing machine, and Fig. 2 is a transverse vertical section of the same.

This invention has relation to improvements in machines for shearing and punching metals; and it consists in the arrangement and novel construction of the various devices used, and in their co-operation, whereby very important results are obtained, as will be hereinafter more fully set forth.

In the annexed drawings, the letter A designates the bed-piece of my improved shearing and punching apparatus, consisting of a horizontal bar, *a*, and an upright arm, *b*. This piece is supported upon a suitable bench or frame, A′, consisting essentially of two legs, *b′*, and an inclined shoe, *c*, which is bolted to the under side of bed-piece A, passes between the said legs, and extends sufficiently beyond the end of the said bed-piece to afford an adequate base to the machine. I do not, however, limit myself to this particular construction, as I may adopt any other support affording a satisfactory result. Arm *b* is provided near its upper end with an enlargement, *d*, in which is formed a recess, *i*, the lateral walls of which are vertical, and its end curved in the arc of a circle, as shown in Fig. 1, and in the bearing thus formed is secured, by means of a pivot, *f*, a vertically-vibrating punch and shear lever, C, which latter is of the same length as, and parallel to, the part *a* of the bed-piece A. As shown in dotted lines, Fig. 1, the end of lever C, fitting in recess *i*, is rounded to correspond to the contour of the end wall of the recess, and has a free vertical movement therein, the pivot being simply employed to hold the said lever to its engagement with arm *b*, and is entirely free of all strain other than that incurred in so doing. Lever C passes between two upright arms, D, which are rigidly bolted to the horizontal part *a* of bed-piece A, and serve to prevent the said lever from lateral vibration, whereby the socket *i* would be greatly injured and endangered, and the shear-blade E E′, secured respectively to the said lever and bed-piece A, thrown out of line. F indicates a cam of the usual form, which is mounted, by means of a bolt, *f′*, in the upper ends of guide-arms D above lever C. This cam is operated by means of an arm or handle, G, and when the latter is drawn forcibly downward will bring the cutting-edges of shear-blades E E′ together, thus dividing a sheet or bar of metal placed between the same. It will at the same time approximate and bring together a removable punch-bar, *g*, and a die, *h*, secured, respectively, upon the lever and the bed-piece near their free ends. Shear-blades E E′ are secured, respectively, to the vertical faces of two raised flanges, *j*, and may be removed therefrom when requisite for sharpening or other purposes. They are thus endowed with great rigidity, and their heels bearing upon a plane surface at right angles to the vertical faces of the lugs or flanges *j*, they are rendered incapable of lateral vertical vibration, and will, consequently, make a clean cut. Die *h* is seated in a tapering dovetailed groove in the end of part *a*, and is prevented from casual displacement, whereby the aperture in the die and in its bed-piece would be thrown out of line, by means of a turn-button or catch, *l*. It is thus rigidly secured in place against all casual displacement, but may be readily removed, as may also be the punch. S designates a strong (preferably metallic) spring, which is bolted to the outside of arm *b*, in a vertical position. The free end of spring S is connected, by means of a flexible chain or bar, H, to the lever C, and will, consequently, be drawn or bent toward the cam end of the apparatus when the latter is in the act of cutting or punching. When the handle by which the cam is operated is released, the reaction of this spring will retract lever C and bring it into proper position for a second operation, at the same time raising handle G. The latter

is, however, prevented from undue backward vibration, whereby it would assume an inconvenient position for a subsequent operation, by a chain, *n*, secured to the handle and to the end of the lever adjacent thereto. Spring S being outside of the apparatus will enable me to utilize the entire space between lever C and part A for the shear-blades, punches, and dies, is entirely out of the way, and will not become clogged with oil and metal cuttings or clippings. It is thus always in an operative condition.

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

1. The angular bed-piece A and the vertically-vibrating punch-lever C, socketed therein, in combination with the upright guides D, embracing the said lever, the cam F, having its bearings in the said guides, and the operating-arm G, substantially as specified.

2. In combination with the bed-piece A, lever C, and guides D, the spring S, secured to the bed-piece upon its outside, and the connecting-chain H, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

SAMUEL J. McDONALD.

Witnesses:
WM. T. SULLIVAN,
OWEN H. McGEE.