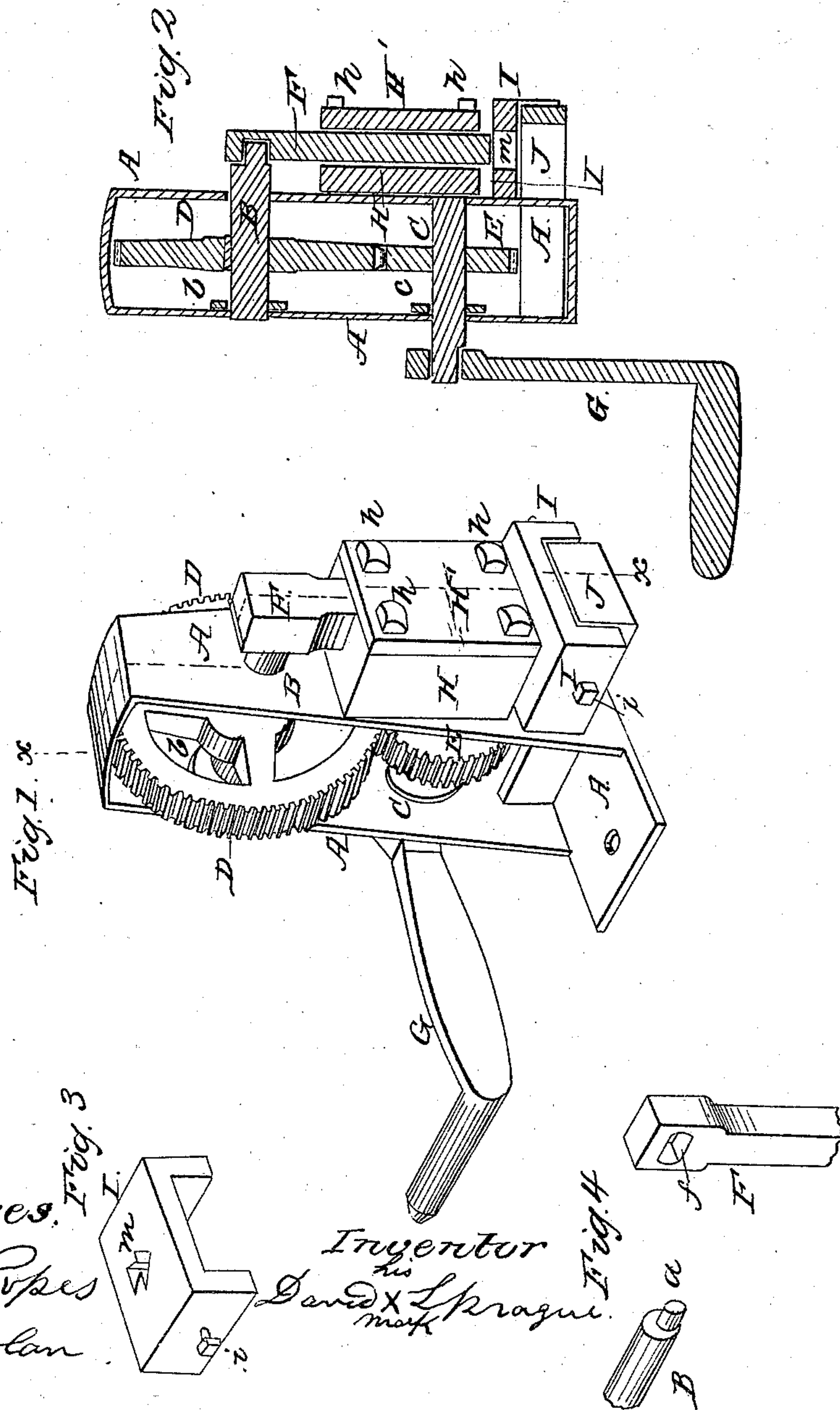


D. SPRAGUE.  
Metal Punch.

No. 31,681.

Patented March 12, 1861.



witnesses.  
J. V. Ropes  
J. S. Devlan.

Inventor  
David Sprague.



# UNITED STATES PATENT OFFICE.

DAVID SPRAGUE, OF ELIZABETHPORT, NEW JERSEY.

## PUNCHING-MACHINE.

Specification of Letters Patent No. 31,681, dated March 12, 1861.

*To all whom it may concern:*

Be it known that I, DAVID SPRAGUE, of Elizabethport, county of Union, in the State of New Jersey, have invented certain new and useful Improvements in Punching-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to certain novelties in the mechanical construction and combination of devices, in a punching machine, adapted principally to the punching of a variety of small work such as various designs of harvester cutters, &c.; and my invention consists in the novel method of forming and combining the mechanical devices constituting the machine as hereinafter fully explained—

To enable those skilled in the art to make and use my invention I will proceed to describe its construction and operation referring by letters to the accompanying drawings forming part of this specification and in which—

Figure 1 represents in perspective one of my improved machines, adapted to punching out harvester teeth. Fig. 2 is a vertical section at the line  $x-x$  Fig. 1. Fig. 3 is a perspective of the female die detached. Fig. 4 embraces detail perspectives of the cam shaft and male die.

In the several views the same letters indicate the same parts of the apparatus.

A, is the frame of the machine, which I propose to make of cast iron of about the form illustrated. In this frame are hung two parallel shafts, B, and C, to the latter the motive power is applied in any known manner (I have shown a crank handle G, as an illustration) and on it is keyed a spur pinion E, which meshes into and drives a spur gear, D, fastened on shaft B. On shafts, B, and C, are fixed respectively collars,  $b$ , and,  $c$ , which bear against the inner surface of one side of frame, A, as clearly shown at Figs. 1 and 2, and which retain the said shafts longitudinally, in one direction, (they are held in the other direction in a manner to be presently explained.)

J, is a table, or stand which projects from the front side of frame, A, and on which is arranged the female die, I, which is furnished with set screws,  $i$ ,  $i$ , by which it is adjusted and secured.

H, H', is the bearing box in which the

male die, F, works and which is made in two parts as shown in the drawing, and bolted together, and to the frame, A, by bolt rods  $h$ ,  $h$ , &c.

On the end of shaft, B, is formed eccentrically, as shown at Fig. 4, a smaller shaft, or cam stud,  $a$ , which is equal in diameter to the width of slot,  $f$ , in the end of die piece, F. This slot,  $f$ , is at least as long as the diameter of shaft, B, so as to admit of the cam,  $a$ , making an entire revolution without moving the bar, F, laterally. It will be seen that by means of the eccentric shaft or cam,  $a$ , working in the slot,  $f$ , as the shaft, B, rotates the bar, F, will be raised and lowered, or have a uniform reciprocatory motion imparted to it.

The shaft, C, it will be seen has its front end flush with the outer surface of the front side of frame A, so that when the block, H, is placed and held against the front side of frame A the shaft, C, will be held, or retained laterally in one direction, with its collar,  $c$ , against inner side of frame, A, which retains said shaft, C, (as before mentioned) in the other direction. It will also be seen that when the bar or male die, F, is placed in its bearing, in block, H, (with its slot,  $f$ , around pin or cam,  $a$ ,) and the cap plate, H', placed on H, and secured, as shown, the bar or die, F, will hold the shaft, B, longitudinally in place in its bearings with the collar,  $b$ , against the frame. Thus the shafts are rendered simple as well as the boxes—and yet the said shafts are maintained in a fixed position longitudinally in order that the gears and working parts shall be kept in perfect adjustment, while at the same time the whole is held and released at pleasure by putting in or withdrawing the bolts,  $h$ .

In the female die, I, I have illustrated a form for a harvester cutter—the male die being formed to match. It is customary to have the bar, which corresponds to F, a permanent fixture in fixed boxes, and its lower end adapted to receive different dies—which have to be adjusted and secured in said bars—but in my machine I make the die form the reciprocating arm by simply extending it in form of a shank and cutting a slot,  $f$ , to fit the cam pin,  $a$ , and then secure the whole in proper relative position by the pin or less bolts  $h$ , as hereinbefore described.

I am aware that the principle of operation

in my apparatus is the same as is involved  
in punching machines and I do not there-  
fore make any broad claim thereto, but I  
am not aware of punching machines for  
light work having been constructed so that  
the male die is driven directly as in my ma-  
chine, from the cam shaft—and so that the  
whole of the working parts are adjusted and  
held by the removable parts as hereinbefore  
described.

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

The removable die F, with a slot, *f*, in  
combination with the cam, *a*, on main cam  
shaft, B, the whole constructed and oper- 15  
ating as described for the purpose set forth.

In testimony whereof I have hereunto set  
my hand and affixed my seal this 22nd day  
of November 1860.

DAVID <sup>his</sup> × SPRAGUE. [L. s.]  
mark

Witnesses:

J. M. ROPER,  
P. S. DEVLAN.