No. 670,067. Patented Mar. 19, 1901.

E. SOUTHWORTH.

CONVERTIBLE ROUND CORNERING AND PUNCHING MACHINE.

(Application filed Jan. 28, 1901.)

(No Model.)

Fig. 1.

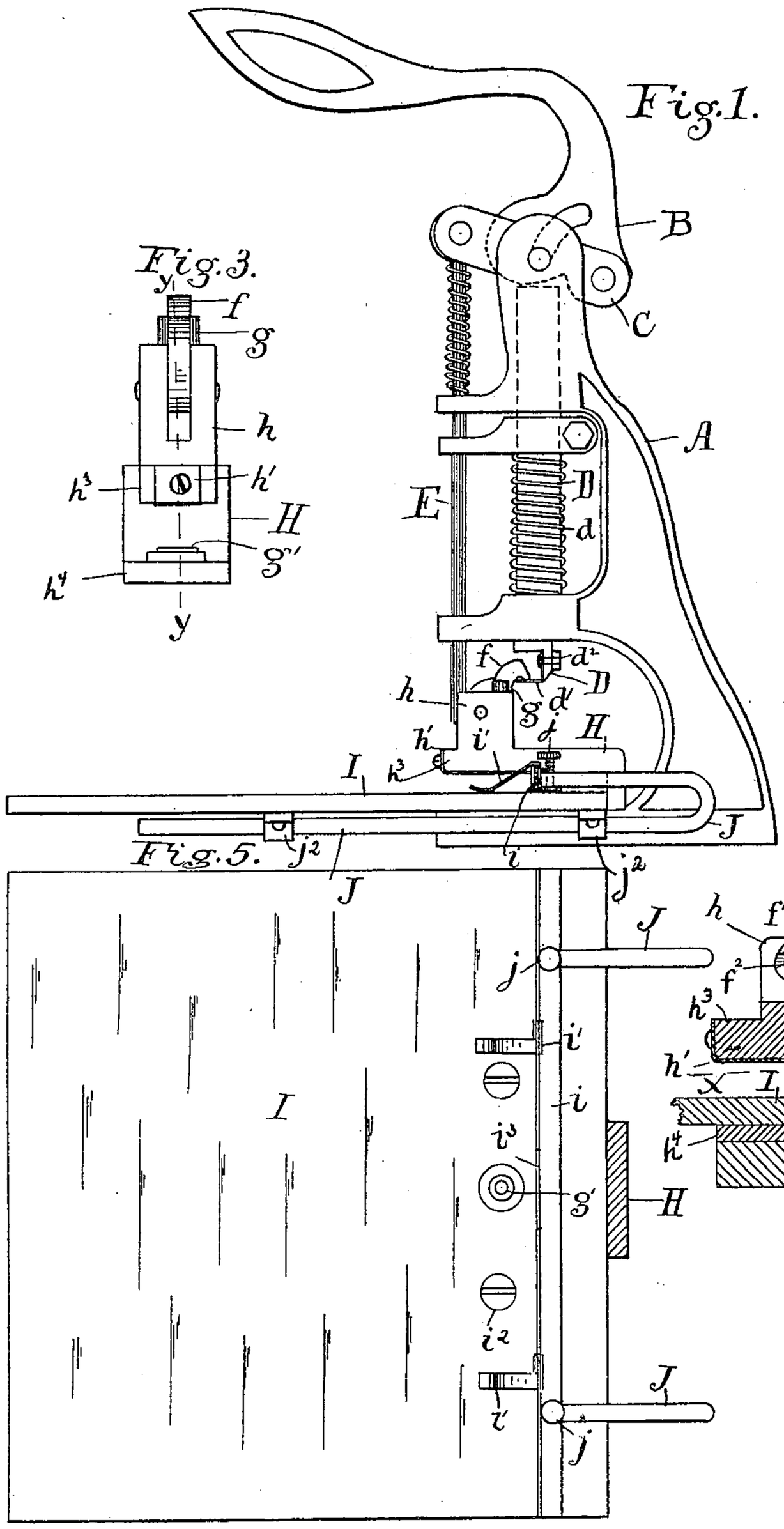

Fig. 3.

Fig. 5.

Fig. 2.

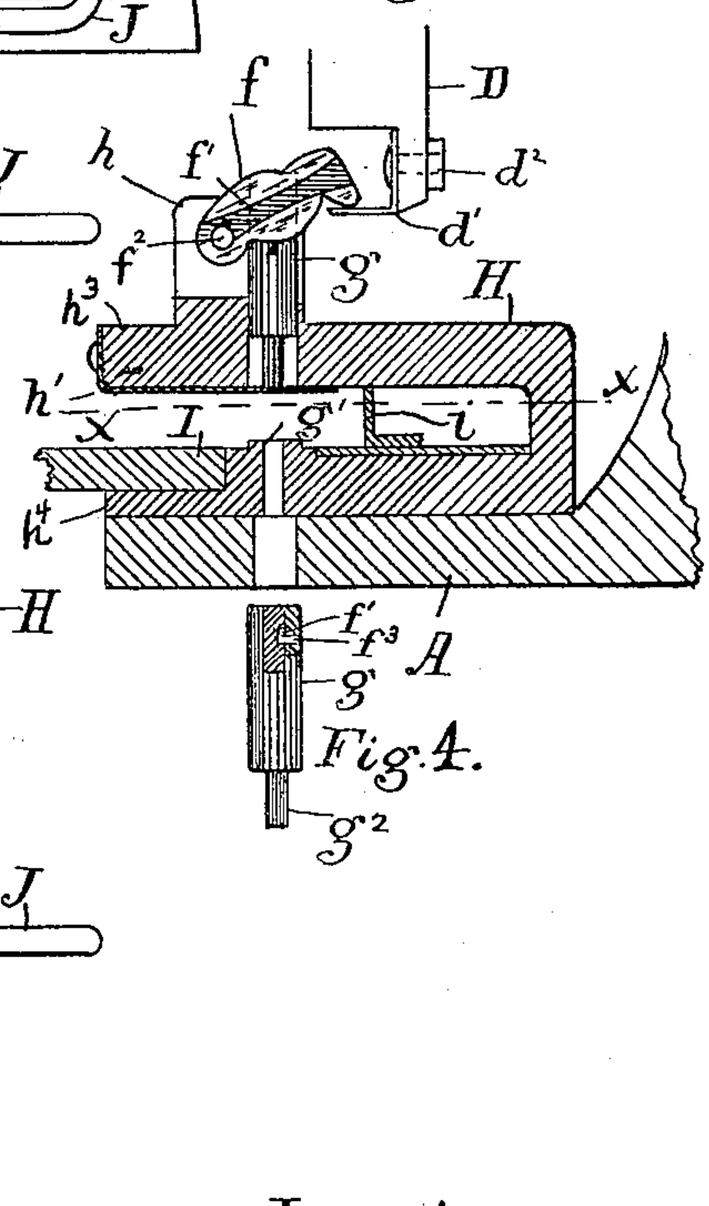

Fig. 4.

Witnesses:
F. M. Godfrey
Harry S. Rice

Inventor:
Edward Southworth
by S. W. Bates
Atty.

UNITED STATES PATENT OFFICE.

EDWARD SOUTHWORTH, OF PORTLAND, MAINE.

CONVERTIBLE ROUND-CORNERING AND PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,067, dated March 19, 1901.

Application filed January 28, 1901. Serial No. 44,955. (No model.)

To all whom it may concern:

Be it known that I, EDWARD SOUTHWORTH, a citizen of the United States of America, and a resident of Portland, Cumberland county, State of Maine, have invented certain new and useful Improvements in Convertible Round-Cornering and Punching Machines, of which the following is a specification.

My invention relates to an attachment to the round-cornering machine patented to me August 2, 1899, by Letters Patent No. 629,824, by which it can be converted quickly into a punching-machine for perforating paper.

The round-cornering machine as patented consisted of a plunger with a cutting-knife on its lower end, a lever pivoted to the machine at a point between its ends, a cam for depressing the plunger pivoted to one end of the lever, and a presser-bar pivoted to the other end of the lever, so that the presser-bar would come down first to clamp the work before leverage would be exerted by the cam to force down the plunger. A wooden block was inserted in the base of the machine, on which the knife descended in the cutting operation. In changing the round-cornering machine over into a punching-machine the block is removed and a punch-frame is fitted in its place, containing a punch and die, the punch being operated by a cam-lever, the outer end of which is forced down by the plunger, from the end of which the knife has been removed, thus increasing the leverage and power of the punch over that of the plunger. A table with adjustable guides is provided for holding the work.

I illustrate my invention by means of the accompanying drawings, in which—

Figure 1 is a side elevation of my converted round-cornering machine. Fig. 2 is a section on the line *y y* of Fig. 3. Fig. 3 is a front view of the punch-frame. Fig. 4 is a detail of the punch; and Fig. 5 is a section on the line *x x* of Fig. 2, showing the table in plan.

A represents the standard; C, the pivoted lever; B, the cam; D, the plunger, and E is the presser-rod, *d* being the spring which lifts the plunger. These parts are as shown and described in my said patent and need no more particular description.

In converting the machine to a punching-machine I remove the knife from the lower end of the plunger and substitute therefor an angle-iron *d'* for the purpose hereinafter specified, the angle-iron being secured by the bolt d^2. The cutting-block is removed, and in its place I insert a punch-frame, shown as a casting H, having an upper and lower horizontal member h^3 and h^4, respectively, with a rear connecting portion, providing a recess into which the paper may be slid from the front. A stripper *h'* is placed on the front and under side of the upper member to hold the paper down when the punch is being removed. The stripper is provided with an opening of just the size of the male die, and through which said die passes. A punch is mounted in the punch-frame, so as to be operated by the plunger with an increased leverage, since a greater power is required to operate the punch than to operate the knife of the round-cornering machine.

The punch *g* is here shown as mounted in an extension *h*, which projects upward from the punch-frame, so as to be vertically movable. It has on its lower end a male die g^2, which is adapted to fit a female die *g'* in the lower member of the frame. The punch is raised and lowered by the cam-lever *f*, pivoted at f^2 and having a cam-surface on its under edge adapted to press down the punch and a free end which projects out beyond the extension *h* into the path of the lower end of the plunger D, by which it is depressed. Means are provided for positively lifting the punch, and for this purpose I bifurcate its upper end and have the cam-lever fit within the bifurcation. A pin f^3, Fig. 4, is inserted in one of the sides of the bifurcated end and projects into a longitudinal slot *f'* in the cam-lever. Thus when the lever rises the punch rises with it, being lifted by the pin. The lever is lifted positively by the angle-piece *d'*, already described, which comes normally beneath the outer end of the cam-lever and lifts it as the plunger rises. It will thus be seen that when the plunger goes down it depresses the cam-lever and forces down the punch and when it rises it lifts the punch.

To save the frame H from being broken by the upward stress on the pivot f^2 when the punch is descending, I make use of the presser-rod E, from which the foot has been removed and which descends onto the end of the upper

member of the punch-frame, pressing down on the same while the plunger is descending.

For the purpose of holding the work I provide a table I, which slips in between the upper and lower members of the punch-frame and is provided with an opening for the female die. It is held in place by screws i^2, which secure it to the base of the machine. A guide for the paper is provided, here shown as a strip of angle metal i, held in place on the table by means of clamping-bars J, composed, as here shown, of metal rods bent to form two parallel limbs, one shorter than the other. The larger limb is held in guides j^2 on the under side of the table, so that the clamping-bar may slide therein longitudinally, and the short upper end extends over the top of the table and is provided at its end with a clamp-screw j, which is adapted to impinge on the guide i to hold it in place. The screw j tends to hold both the guides and clamping-rod firmly in place. This guide furnishes a gage for the paper when the latter is being punched, and in connection with it are used two sliding stops i', which embrace the vertical edge of the guide and extend forward and downward to the table.

It will be seen that the round-cornering machine may be quickly converted into a punching-machine with the necessary increase of power by a few very simple changes, so that one machine practically does the work of two.

I claim—

1. The herein-described convertible round-cornering and punching machine composed of a plunger, a lever pivoted to the machine at a point between its ends, a cam for depressing said plunger pivoted to one end of said lever, a punch-frame secured to the machine below said plunger, a punch mounted to slide vertically in said frame, a male die on the lower end of said punch, a female die in the lower portion of said frame adapted to receive said male die and a cam-lever pivoted in said frame and adapted to move said punch vertically, the end of said lever extending to a point beneath the lower end of said plunger and adapted to be depressed thereby.

2. The herein-described convertible round-cornering and punching machine composed of a plunger, a lever pivoted to the machine at a point between its ends, a cam for depressing said plunger pivoted to one end of said lever, a presser-rod pivoted to the other end of said lever a punch-frame secured to the machine below said plunger, a punch mounted to slide vertically in said frame, a male die on the lower end of said punch, a female die in the lower portion of said frame adapted to receive said male die, a cam-lever pivoted in said frame and adapted to move said punch vertically, the end of said lever extending to a point beneath the lower end of said plunger and adapted to be depressed thereby and an angle or projection on said plunger for lifting said cam-lever.

3. The herein-described convertible round-cornering and punching machine composed of a plunger, a lever pivoted to the machine at a point between its ends, a cam for depressing said plunger pivoted to one end of said lever, a presser-rod pivoted to the other end of said lever, a punch-frame secured to the machine below said plunger, a punch mounted to slide vertically in said frame, a male die on the lower end of said punch, a female die in the lower portion of said frame and adapted to receive said male die and a cam-lever pivoted in said frame and adapted to move said punch vertically, the end of said lever extending to a point beneath the lower end of said plunger and adapted to be depressed thereby, the lower end of said presser-rod being adapted to hold down said frame while the punch is in operation.

4. The herein-described machine for punching paper having a table secured to the base thereof, a guide on said table, a clamping-bar composed of a metal rod bent to have two parallel limbs, the lower one being slidably held in guides on the under side of said table, a set-screw extending through the end of the upper limb and adapted to hold said guide in place and sliding stops on said guide.

Signed at Portland, Maine, this 15th day of January, 1901.

EDWARD SOUTHWORTH.

Witnesses:
S. W. BATES,
L. M. GODFREY.