

(No Model.)

J. M. LONG.
PUNCHING MACHINE.

No. 547,554.

Patented Oct. 8, 1895.

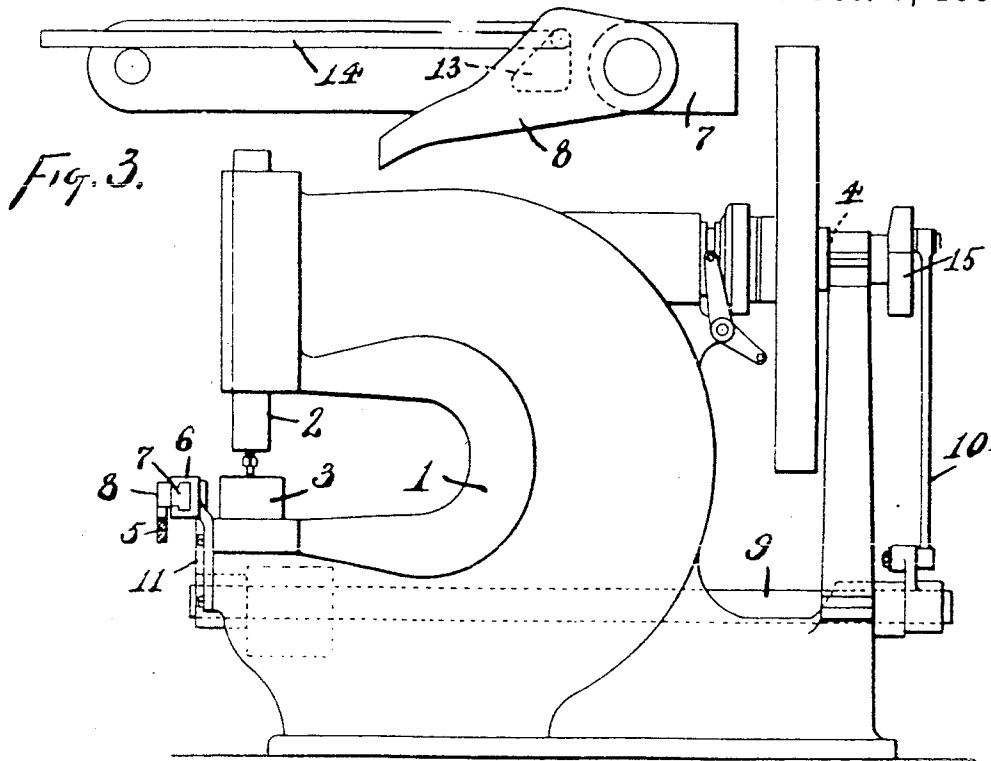
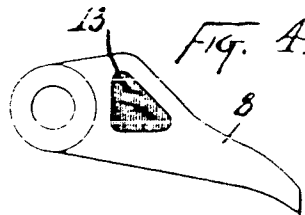
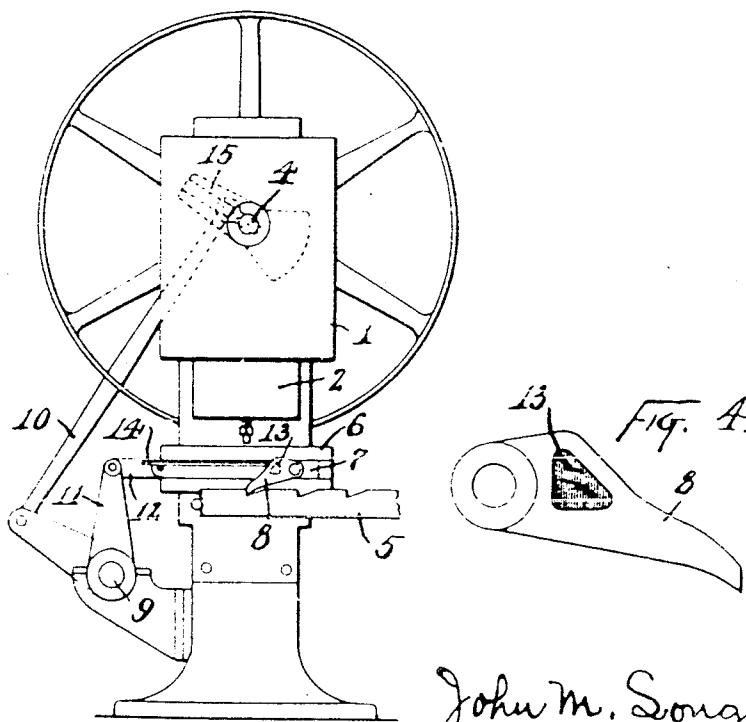


Fig. 1.



Witnesses:

E. R. Shipley.
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Fig. 2.

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JOHN M. LONG, OF HAMILTON, OHIO.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 547,554, dated October 8, 1895.

Application filed June 6, 1895. Serial No. 551,825. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. LONG, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Punching-Machines, of which the following is a specification.

This invention pertains to improvements in that class of self-feeding punching-machines in which the sheet to be punched is secured to a longitudinally-moving table, which is advanced by suitable mechanism at each stroke of the punch, so as to produce a row of properly-spaced holes. I do not show or describe the table or its supports, as they may be of any usual or well-known form of structure.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a punching-machine embodying my improvements; Fig. 2, a front elevation of the same; Fig. 3, a front elevation, on an enlarged scale, of the pawl-bar, and Fig. 4 a rear elevation of the pawl.

In the drawings, 1 indicates the body of the punching-machine, of ordinary construction; 2, the punch-ram at the front of the body of the machine; 3, the die; 4, the cam-shaft extending from the ram through and rearwardly beyond the body of the machine; 5, a notched rack to be secured to the usual traveling table which supports the work, this rack having notches spaced in accordance with the desired spacing of the punching; 6, a horizontal guideway rigidly secured to the body of the machine near to and parallel with the rack-bar 5, this guideway being at right angles to the movement of punch-ram 2; 7, a pawl-bar arranged to slide in the guideway 6; 8, a pawl pivoted to pawl-bar 7, its point engaging the rack-bar 5; 9, a rock-shaft supported by the body of the machine parallel with cam-shaft 4 and having its forward end about in the plane of pawl-bar 7; 10, a link positively engaging crank-arms on the rear ends of shaft 9 and shaft 4, whereby the movement of shaft 4, in operating the punch-ram, results in rotatory motion of rock-shaft 9; 11, an arm fast on the front end of shaft 9; 12, a link connecting this arm with pawl-bar 7, whereby the movement of the rock-shaft results in reciprocations of the pawl-bar and pawl; 13, a cam-

shaped recess in the rear face of pawl 8; 14, a rod sliding on pawl-bar 7 and having at its inner end a projection engaging within the inclined recess 13 of the pawl, and 15 an adjustable crank-arm on shaft 4 for altering the degree of angular motion of rock-shaft 9 and, consequently, the stroke of pawl 8 in both its directions of motion.

It will be obvious that at each stroke of the punch the pawl-bar 7 is positively reciprocated, and that rack-bar 5 will be advanced one tooth. The rack-bar will be notched in correspondence with the desired spacing to be produced in the punching. Crank 15 is to be adjusted to such throw that pawl 8 will have a stroke in excess of one space of toothing in rack-bar 5, but not equal to two of the spacings. Great accuracy of adjustment of movement for the pawl is not therefore requisite, it being only necessary that the rack-bar shall be accurate. Selective rack-bars may be provided, one for each desired character of spacing, each bar being provided with one notch or tooth for each punching, or, if desired, the rack-bar may have its notches spaced in accordance with a given minimum spacing desired in the punching. With such a bar, such minimum spacing of punching may be produced, or the spacing may be increased in multiples of that minimum spacing by adjusting crank 15 to cause the pawl to have a stroke in excess of the distance represented by the number of teeth representing the desired space, but not equal to the next higher number of teeth. By this means one rack-bar will answer for a given minimum of spacing and multiples thereof. For special work calling for irregular spacing the rack-bar will be notched accordingly, and the pawl-stroke will be adjusted to be in excess of maximum spacing, but not equal to any two contiguous spaces.

By pulling upon rod 14 the pawl is lifted out of engagement with the rack-bar and sustained in an idle position, thus permitting movement to be given to the table of the machine by hand in the usual way.

I claim as my invention—

1. In a punching-machine, the combination, substantially as set forth, of the machine body, the punch ram mounted in the front thereof, the cam-shaft extending from the ram through and rearwardly beyond the body, the adjust-

able crank on the rear end of the cam-shaft, the guideway below the ram and at right angles to the cam-shaft, the pawl-bar sliding therein and carrying a pawl adapted to engage a notched bar on a feed-table, a rock-shaft parallel with the cam-shaft, an arm on the front end of the rock-shaft and engaging the pawl-bar, the arm on the rear end of the rock-shaft, and the link connecting the crank positively with the last-mentioned arm.

2. The combination, substantially as set forth, of a punching machine, a guideway

rigidly supported thereby at right angles to the movement of the punch-ram of the machine, a pawl-bar sliding in said guideway and arranged to be reciprocated from the actuating mechanism of the machine, a pawl pivoted to the pawl-bar and having a cam-shaped recess, and a rod sliding in said pawl-bar and having a projection engaging said recess.

JOHN M. LONG.

Witnesses:

J. W. SEE,

I. N. SLAYBACK.