(No Model.)

J. M. LONG.

PUNCHING PRESS.

No. 329,918. Patented Nov. 10, 1885.

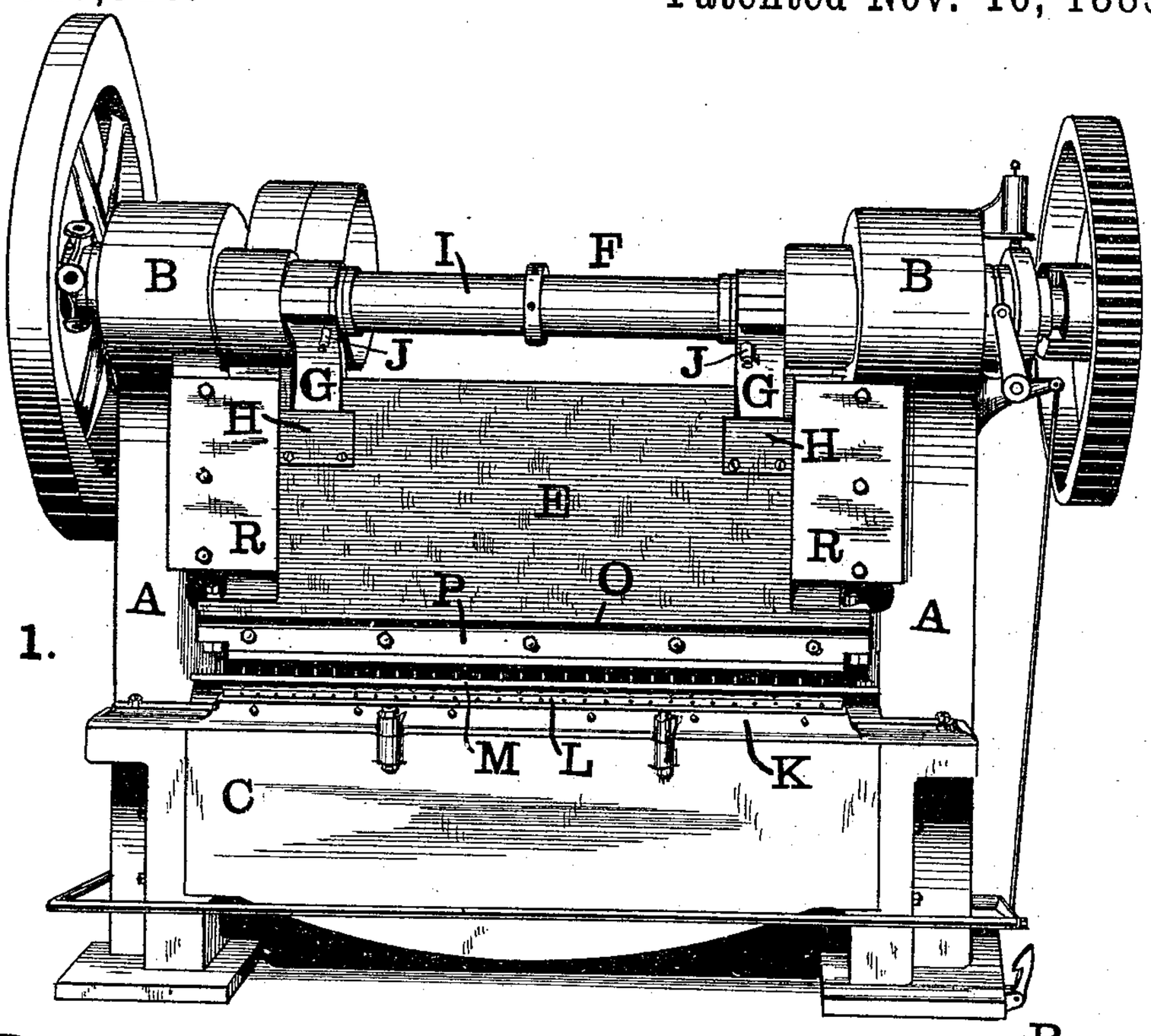

Fig. 1.

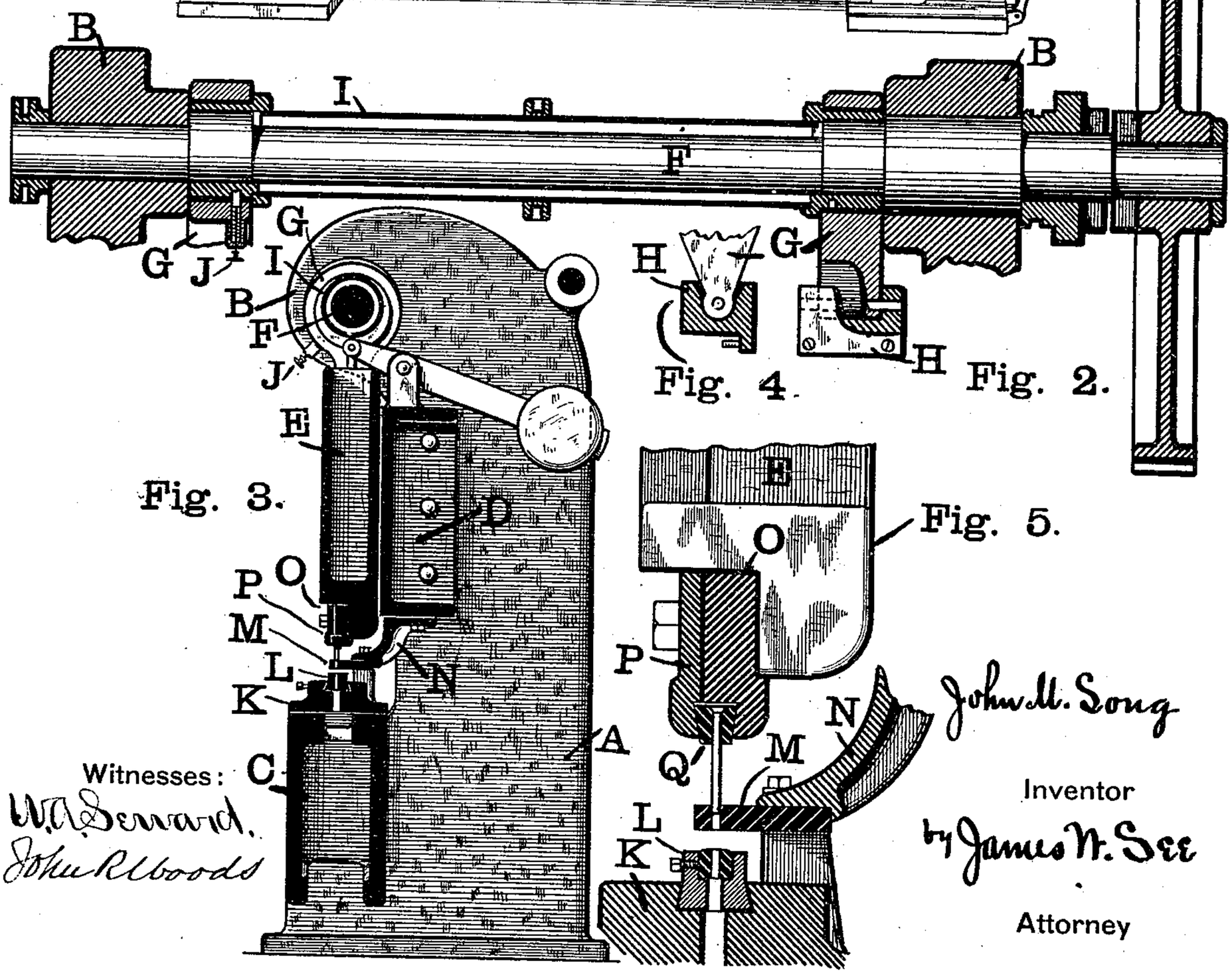

Fig. 3.

Fig. 4.

Fig. 2.

Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN M. LONG, OF HAMILTON, OHIO.

PUNCHING-PRESS.

SPECIFICATION forming part of Letters Patent No. 329,918, dated November 10, 1885.

Application filed August 7, 1885. Serial No. 173,833. (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-Presses, of which the following is a specification.

This invention pertains to presses for punching, shearing, &c., and it will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a front view of a punching-press illustrating my improvements; Fig. 2, a longitudinal vertical section of the cam-shaft of the same, shown in its bearings and with one pitman attached; Fig. 3, a vertical section of the press at about the center of its width in a plane transverse to the cam-shaft; Fig. 4, a side view of a foot of one of the pitmen, with an attached foot-block shown in vertical section; and Fig. 5, a vertical transverse section of the punch and die-holding apparatus, a portion of the ram being shown in elevation.

The machine, as illustrated, is adapted for the punching at one stroke of a row of holes in a wide sheet of metal or the like.

In the drawings, A represents two upright parallel columns provided with foot-flanges; B, cam-shaft bearings in the top portions of the columns, which portions will project forward of the face of the columns; C, a hollow girder reaching across from column to column at their bases, and rigidly bolted thereto, each column having a forward projection to engage its end of the girder, whereby the girder occupies a position forward of the face of the columns; D, a second girder reaching from column to column and bolted thereto, said girder being disposed below the line of the bearings B and above the base-girder, and presenting its front face in the same vertical plane with the front face of the columns; E, the vertically-reciprocating ram or gate of the press, the same fitting against the front face of the girder D, and being guided by shoes engaging in rabbets at its ends; F, the cam-shaft journaled in the bearings of the columns, and provided with two eccentrics, one just within each of the column-bearings; G, two pitmen engaging the eccentrics and reaching downward therefrom; H, foot-blocks bolted into recesses in the front of the ram, and provided each with a concave pocket in its top, and with a journal-pin longitudinally across the pocket, the pockets and pins being engaged by the feet of the pitmen; I, a tube surrounding the central portion of the cam-shaft, and rigidly armed at each end with an eccentric shell, forming eccentric bushings for the pitmen; J, detents, one in each pitman, serving to prevent the rotation of the bushings with reference to the pitman; K, the die-bed, bolted to the top of the base-girder and to shoulders projecting forwardly from the face of the columns; L, the die-holder, consisting of a long strip seating in a dovetail in the bed, and provided in its upper surface with a series of dies, one for each punch; M, the stripper and punch-guide consisting of a flat strip perforated for the passage of the punches, and supported at each end by standards rising from the die-bed or from the shoulders of the columns, the height of the stripper being such that the punches have a bearing in it throughout the stroke; N, a long flanged web reaching from the lower edge of the girder D to the stripper, and securely bolted to the girder and stripper; O, a rabbet in the lower edge of the ram; P, a split clamp securely bolted to this rabbet; Q, the punch-holder, consisting of a long dovetail bar held in dovetail rabbets in the clamp P, and provided with a longitudinal series of punches; and R the shoes, engaging the end rabbets of the ram and bolted to forward projections from the columns.

The base-girder is cast hollow and provided with cross-girths to stiffen it. Its top is slotted to permit the passage of punchings. The die-holder is held in the die-bed by set-screws, and each die is held in die-holder by a set-screw.

The punches are formed of short parallel rods provided with heads at their upper ends. They are inserted vertically downward through the punch-holder, and their upward thrust is met by an abutment-strip inserted in the clamp above the punch-holder.

The web N provides the stripper with a rigid support its whole length without interfering with the passage of the sheet metal below it. The slender punches, which at no time during the stroke leave the stripper, become thus provided with a steadying and di-

recting guide, which insures that they shall enter their dies fairly.

The ram has its rear bearing against the girder D, and it is rigidly guided by the end shoes, R, which are bolted to the columns.

The downward thrust of the pitmen is taken by the pocket engagements in the foot-blocks, and the upward pull of the pitman is upon the journal-pins of the foot-blocks.

The eccentrics revolve within the bushings of the pitman, which bushings are prevented from revolving by means of the detents. These detents are held in by springs, and they can be readily disengaged. The two bushings are integrally united by the tube, and the tube is provided with a capstan-collar, by which the tube and the bushings may be rotated, and the bushings are provided with holes, in which the detents engage. The bushings are eccentric, and if the detents be disengaged they may revolve so as to alter the virtual length of the pitmen, whereby the ram may be adjusted uniformly at each end independent of the eccentric.

The cam-shaft has upon one end—the left-hand end—a capstan-head by which it may be rotated by hand in setting the dies, &c. Upon the other end of the cam-shaft there is a spur-gear, which is driven by a pinion upon the counter-shaft, which is carried in bearings in the column to the rear of the cam-shaft, the counter-shaft being provided with a fly-wheel and with tight and loose pulleys for belts. The spur-gear is not fast on the cam-shaft, but is free to revolve loosely thereon. This spur-gear has a clutch-hub, and a sliding clutch upon the cam-shaft serves to lock the gear to the cam-shaft when it is desired that the cam-shaft revolve with the gear. This sliding clutch is held open by springs, and there is a foot-treadle to close it; hence the ram will reciprocate so long as the treadle is held down; or the treadle may be hooked down permanently. The clutch is also provided with an automatic stop-motion, by means of which, after the clutch has been thrown into engagement by foot-motion, the cam-shaft will make one revolution and then stop with the ram at its highest point, the clutch automatically disengaging.

No special attempt is made herein to describe features of construction which are common and well-known as pertaining to this class of machines.

I claim as my invention—

1. In a punching or shearing press, the combination, substantially as set forth, of supporting-columns provided with journal-bearings at their upper ends in a plane forward of the faces of the columns, a girder connecting the columns at their bases and disposed perpendicularly below the axis of said journal-bearings, a girder reaching from column to column and disposed with its front face to the rear of the plane of said base-girder and journal-bearings, a ram having its back seating against the face of said last-mentioned girder and guided by end shoes secured to the columns, a cam-shaft journaled in the top of the columns, and means, substantially as set forth, for causing the rotating cam-shaft to reciprocate the ram.

2. In a punching or shearing press, the combination, substantially as set forth, of a sliding ram, a cam-shaft disposed above the ram, a pitman reaching from the cam-shaft downward, and provided with a rounded end and with a bearing for a journal-pin, and a foot-block, H, secured in a pocket in the face of the ram, and provided with a pocket and journal-pin engaged by the foot of the pitman.

3. In a punching or shearing press, the combination, substantially as set forth, of a reciprocating ram, a shaft provided with two eccentrics, a pitman reaching from each of said eccentrics to the ram, a rotatable tube reaching from eccentric to eccentric and armed at each end with an eccentric bushing for the pitman, and a detent at each pitman for preventing the rotation of the bushing in the pitman.

4. In a punching or shearing press, the combination, substantially as set forth, of a reciprocating ram having a rabbet at its foot, a divided clamp bolted to such rabbet, and a punch-holding bar held in rabbets in the clamp.

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Witnesses:
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