(No Model.) 3 Sheets—Sheet 1.

C. T. PARRY.

FEED TABLE FOR PUNCHING MACHINES.

No. 343,842. Patented June 15, 1886.

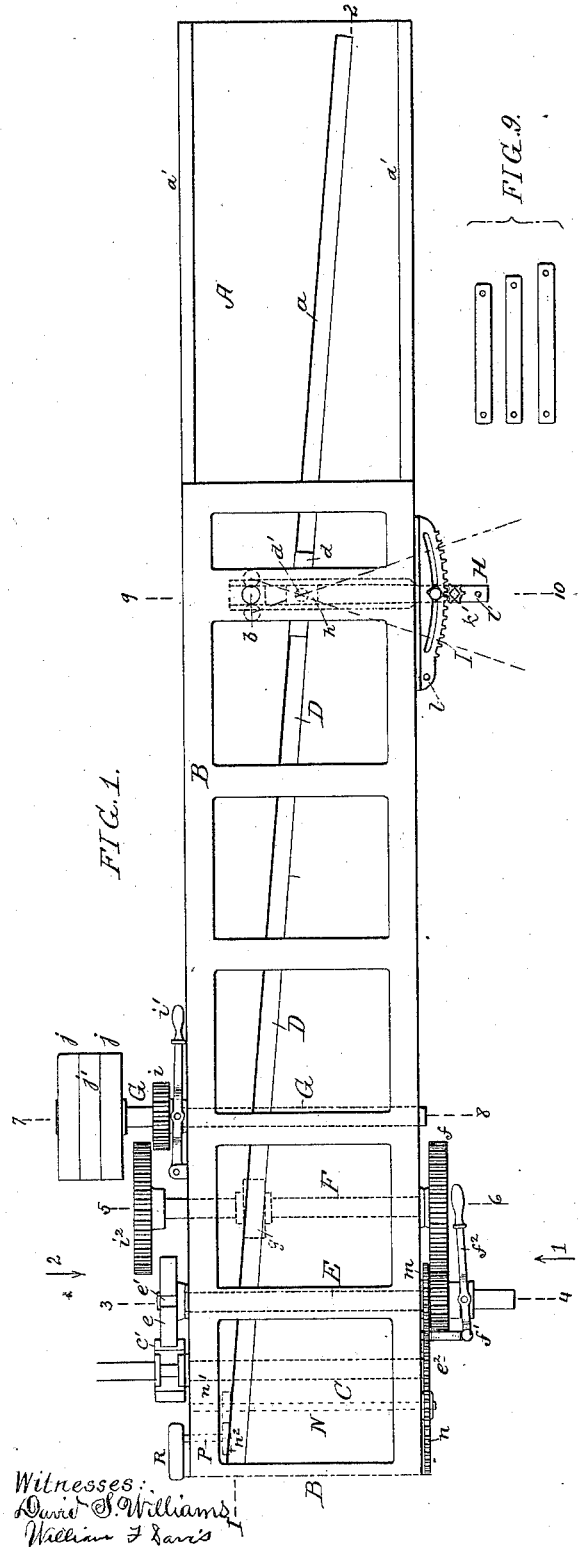

FIG. 1.

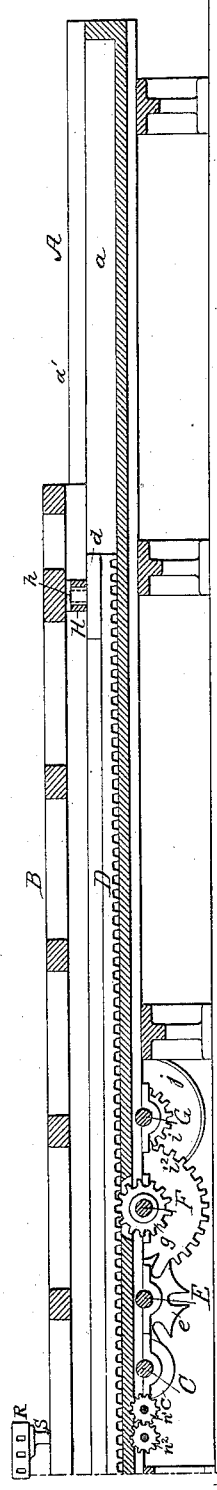

FIG. 2.

FIG. 3.

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Inventor:
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N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.) 3 Sheets—Sheet 2.

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FEED TABLE FOR PUNCHING MACHINES.

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FIG. 3.

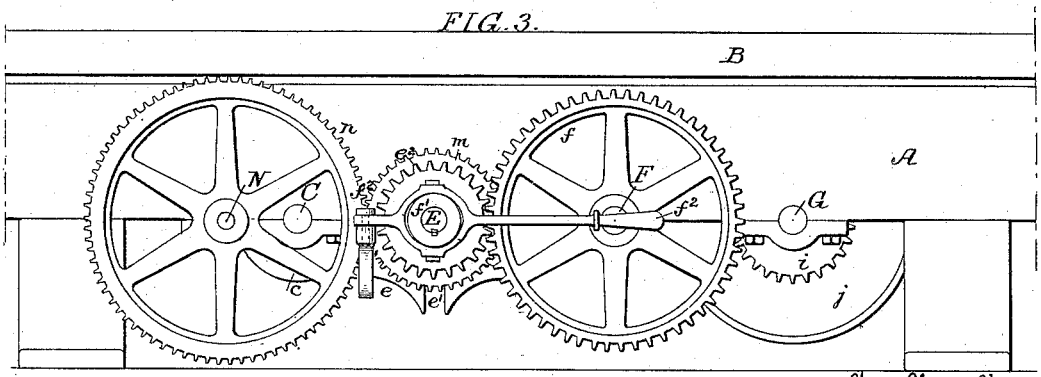


FIG. 4.

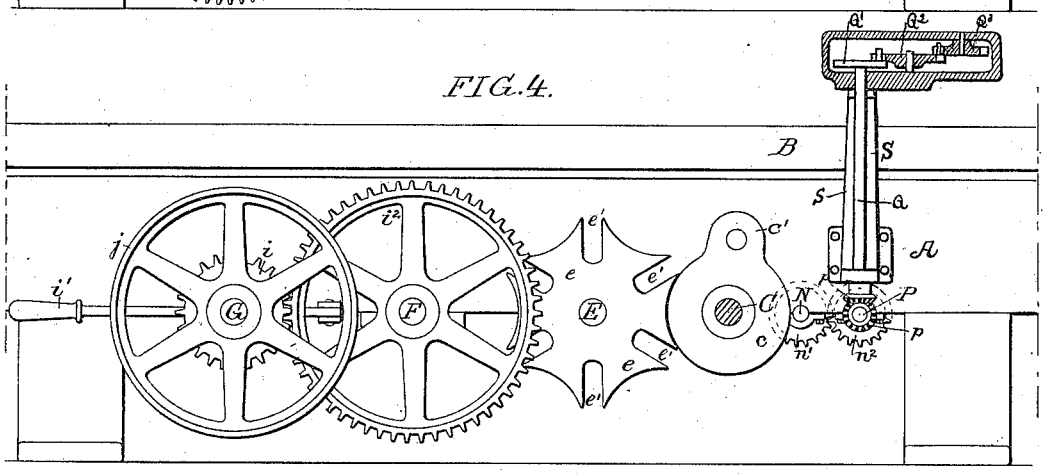
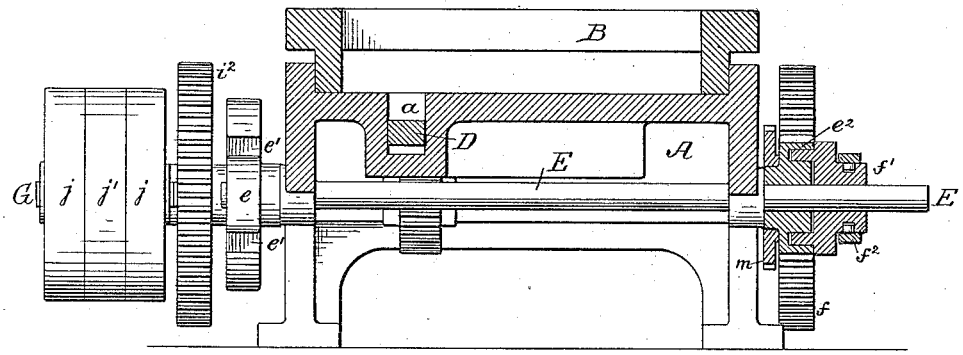


FIG. 5



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(No Model.) 3 Sheets—Sheet 3.

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FIG. 6.

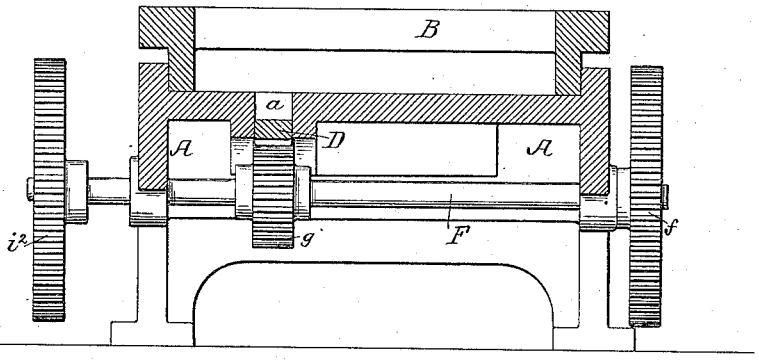


FIG. 7.

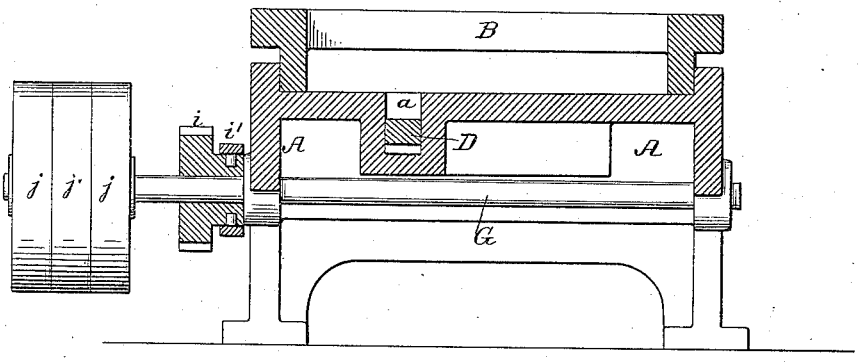


FIG. 8.

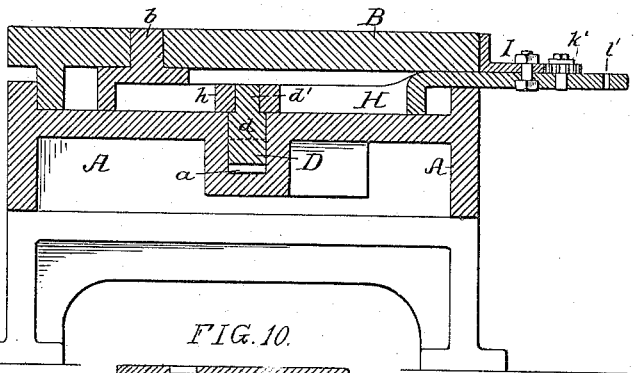
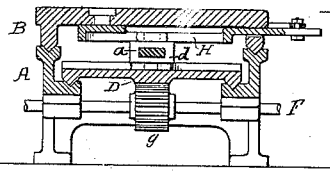


FIG. 10.



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UNITED STATES PATENT OFFICE.

CHARLES T. PARRY, OF PHILADELPHIA, PENNSYLVANIA.

FEED-TABLE FOR PUNCHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 343,842, dated June 15, 1886.

Application filed December 28, 1885. Serial No. 186,893. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. PARRY, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Feed Mechanisms for Punching-Machines, of which the following is a specification.

My invention relates to that class of punching-machines which are more especially designed for punching the rivet-holes in sections of boiler-plates at accurately uniform distances apart. A machine for accomplishing this purpose is illustrated and described in Rankin's Cyclopædia of Machine and Hand Tools, published in London, 1869, plates K 4 and 5.

The main object of my invention is to simplify the construction of machines of this class and make them capable of ready adjustment by any ordinary attendant, and this object I attain as hereinafter fully described.

In the accompanying drawings, Figure 1 is a plan view of the table with my improvements applied thereto. Fig. 2 is a longitudinal section on the line 1 2, Fig. 1. Fig. 3 is a side view of part of the machine, drawn to an enlarged scale, looking in the direction of the arrow 1, Fig. 1. Fig. 4 is a side view of part of the machine, looking in the direction of the arrow 2, Fig. 1. Fig. 5 is a transverse section on the line 3 4, Fig. 1. Fig. 6 is a transverse section on the line 5 6, Fig. 1. Fig. 7 is a transverse section on the line 7 8, Fig. 1; Fig. 8, a transverse section on the line 9 10, Fig. 1; Fig. 9, a view illustrating the different sizes of the templets used, and Fig. 10 a modification.

A is the bed, fixed in front of an ordinary punching-machine, which, however, it has not been deemed necessary to illustrate. Adapted to suitable guides or ways, a', on this bed is a movable work-table, B, which carries the plates to be punched, and to which an intermittent feed movement is imparted by the means described hereinafter.

In the face of the bed A is a longitudinal slot or groove, a, which is arranged at an angle to the ways a'. In this groove travels a rack, D, one end of which is provided with a block, d, fitting accurately in the groove, Figs. 1, 2, and 8. Swiveled to a pin, d', on this block is another block, h, adapted to a slot in a transverse bar, H, one end of which is pivoted to the table B at b, (see Figs. 1, 2, and 8,) the opposite end of the said bar being adjustable, for a purpose described hereinafter. The rack D thus adjustably connected to the work-table B has imparted to it from the main shaft C an intermittent feed motion through the means which I will now proceed to describe.

On the shaft C, which may be a continuation of the main shaft of the punching-machine, is mounted a disk, c, having an arm, c', a pin on which engages with slots e' in a star-wheel, e, on the shaft E. (See Figs. 1, 2, and 4.) The face of the disk c rests in recesses in the star-wheel between the slots e', in order to lock the shaft E during a certain portion of the movement, when the pin of the arm c' is clear of the slots e'. This construction of gear is what is known as the "Geneva Lock." The shaft E is geared to a shaft, F, through the medium of a pinion, e^2, and gear-wheel f, and the pinion e^2 is connected to the shaft through a sliding clutch, f', operated by a handle, f^2, pivoted to a bracket attached to the bed A, so that by manipulating this handle the shaft F can be thrown into or out of gear with the shaft C. The shaft F is provided with a pinion, g, the teeth of which engage with the teeth of the rack D, Figs. 1, 2, and 6, and by these means an intermittent feed movement is imparted to the work-table at each revolution of the shaft C, which moves the table forward one point before each stroke of the punch of the punching-machine. By changing the gears e^2 and f to others of different relative sizes, the extent of feed motion imparted to the table B may be varied, as will be readily understood.

By means of the clutch f', described above, the feed movement may be thrown into or out of action. To return the table after a plate has been punched, for instance, the clutch is thrown clear of the wheel e^2, and a pinion, i, on a shaft, G, is thrown into gear by a lever, i', with a gear-wheel, i^2, on the shaft F. The shaft G is provided with fast and loose driving-pulleys j j'. The above-described gearing may be used to return the table or move it backward and forward at a quick speed, which is desirable when the attendant is adjusting a plate under the punch. The bar H, which is pivoted to the table B at b, is adjustably secured to a slotted segment, I, by a set-

screw, *k*, the segment I being attached to the table, as shown in Fig. 1. The lever H is provided with a hole, *l'*, while the fixed bar I has a hole, *l*, these holes being to receive the pins of templets, Fig. 9, for a purpose explained hereinafter.

The device for automatically counting the number of holes to be punched is constructed as follows: On the hub of the wheel e^2 is a light spur-wheel, *m*, which gears with a larger wheel, *n*, on a transverse shaft, N. This shaft is in the present instance geared to a small shaft, *p*, by spur-wheels n' n^2. The shaft *p* is geared to an upright shaft, Q, by bevel-wheels *p p'*. The shaft Q drives a series of counting-cylinders, which are contained in the box R on the bracket S, secured to the side of the machine.

Any desired form of counting mechanism may be used, that shown in the drawings consisting of a series of wheels, Q' Q^2 Q^3, the wheel Q' on the shaft Q having a pin engaging with the teeth of the wheel Q^2, and the latter a pin engaging with the teeth of the wheel Q^3, so that for each revolution of the wheel Q' there will be a movement of the wheel Q^2 to the extent of one tooth, and for each revolution of the wheel Q^2 a movement of the wheel Q^3 to the extent of one tooth.

It will be evident that the mechanism for driving the counting device may be constructed differently without departing from my invention.

The operation of the machine is as follows: Gear-wheels *e* and *f* are applied to the shafts E and F, of the proper relative size to give about the extent of intermittent feed desired for the punching of the holes at the proper distance apart. The plate to be punched is marked for the first and last holes, the distance apart of which has been carefully calculated. The table is then moved to such a position that the pivot-pin *d'* of the rack will coincide with and be directly underneath the pivot-pin *b* of the lever H. The plate to be punched is then adjusted on and secured to the work-table in such a position that the first or last hole, as previously marked, will be below the punch. The punching mechanism is thrown out of action while the feed motion is thrown into action, so as to feed the plate along under the inoperative punch until the point marked for the last hole—for instance, at the other end of the plate—is as nearly under the punch as the feed motion will bring it, assuming, however, that it is not precisely in line with the punch. The lever H is now so moved from the position shown in Fig. 1, to the right or left, as will be found necessary to move the work-table B to the slight extent necessary to bring the mark on the plate for the punch-hole precisely in line with the punch. The punching mechanism is thrown into action and the feed motion reversed. During the adjusting operation the pin *d'* serves as the fixed pivot on which the bar H is fulcrumed, so that the pin *b* and table B can be readily moved to the required position. (See dotted lines, Fig. 1.) In punching the holes on the return movement it will be found that, owing to the adjustment of the lever H as above described, the holes will be punched at uniform distances apart, and the last hole punched will be precisely on the mark originally laid out, since at that point the table will have returned to its starting position, with the two centers *d* and *d'* in line. It will be understood, of course, that after the above-described adjustment of the lever H, the work-table may be brought back to its starting-point, with the centers *d* and *d'* in line, before the punching mechanism is put in operation; or, in other words, the punching may take place when the table is being fed in either direction after the table has been adjusted for the first and last holes on the plate.

In order to lessen the skill required in working the machine and avoid the calculations necessary to determine the distance apart of the first and last holes of the boiler-plate, as well as to lessen chances for mistakes, I provide templets, Fig. 9, of varying sizes for various classes of work. Thus, the angle at which the lever H has to be adjusted to get a certain spacing of the holes in connection with a certain pair of gears, e^2 and *f*, having once been determined, a templet, Fig. 9, is provided with pins which will fit into the hole *l* in the segment I, and in the hole *l'* of the lever H, when the latter is in its adjusted position. In the same way templets of different lengths are provided for the differing adjusted positions of the lever H demanded by the different spacing required.

The devices above described, and particularly the templets, are more especially useful in punching the plates of telescope or lap joint boilers, when the rivet-holes of one section must correspond with the holes punched in the other section, into or over which it fits. In consequence of this lap the rivet-holes of the larger section have to be a little farther apart than those of the smaller section, so that having determined the number of holes in each section, and having determined the positions of the first and last holes in each section, and the holes having been punched in one section, as above described, the difference in the spacing of the holes of the second section is obtained by the simple adjustment of the lever H. Where the templets are used these calculations are not necessary, since the templets may be provided in sets—one templet for the punching of the holes in the small section and another templet for the corresponding larger section.

In the modification shown in Fig. 10, the guide *a* is in the form of a bar set at an angle to the travel of the work-table, the rack D being guided in suitable ways, and having a slot in which the block *d* travels. The same result is obtained as in the above-described mechanism.

The star-wheel *e* and operating-wheel *c* pro-

vide a most effective means of operating the work-table, as the movement is slow at the beginning, when the pin of the arm c' enters the slot e' of the star-wheel, the movement gradually increasing in speed as the pin nears the inner end of the slot, and then gradually decreasing in speed again as the pin leaves the slot, so that the starting and stopping of the movement of the table is effected without shock or jar.

I claim as my invention—

1. The combination of the bed-plate of a punching-machine, having an inclined guide, with a traveling feed-rack, a block, d, controlled by said guide, a slotted lever, to which said center block is adapted, and a work-table, to which the lever is pivoted, substantially as described.

2. The combination of the bed-plate of a punching-machine, having an inclined guide, with a traveling feed-rack, a center block, d, controlled by said guide, a slotted lever, to which said center block is adapted, a work-table, to which the lever is pivoted, and templets for regulating the adjustment of said lever, all substantially as specified.

3. The combination of the feed-table of a punching-machine, the rack D, connected thereto, and a shaft, F, having a pinion, g, adapted to the teeth of the rack, with intermittently-driven shaft E, gear-wheels f and e^2, the gear-wheel e^2 adapted to be thrown in or out of gear with the wheel f, substantially as set forth.

4. The combination of the feed-table of a punching-machine, the rack D, connected thereto, and the shaft F, having a pinion, g, adapted to the rack, with a driven shaft, G, gear-wheels i and i^2, the gear-wheel i adapted to be thrown in or out of gear with the gear-wheel i^2, substantially as described.

5. The combination of the bed-plate and feed-table of a punching-machine, and mechanism for intermittently reciprocating said feed-table, with counting mechanism geared to the driving mechanism of the machine, whereby each intermittent forward or backward movement of the feed-table is recorded, all substantially as specified.

6. The combination of the work bed or table of a punching-machine, a shaft geared to said table, and having a slotted star-wheel, and a crank-pin for operating the same, whereby a gradual starting and stopping movement is imparted to the bed, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. T. PARRY.

Witnesses:
WILLIAM F. DAVIS,
HARRY SMITH.