(No Model.)

J. F. PFEFFER.

PRINTING RECORDER.

No. 423,273. Patented Mar. 11, 1890.

Fig. 1.

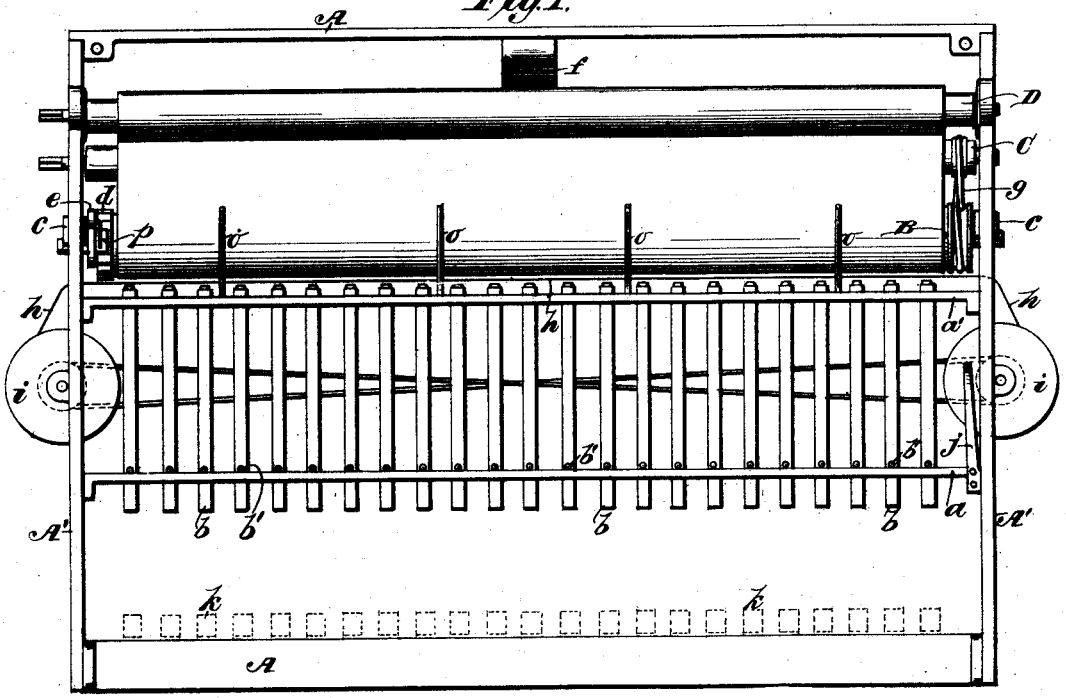


Fig. 2.

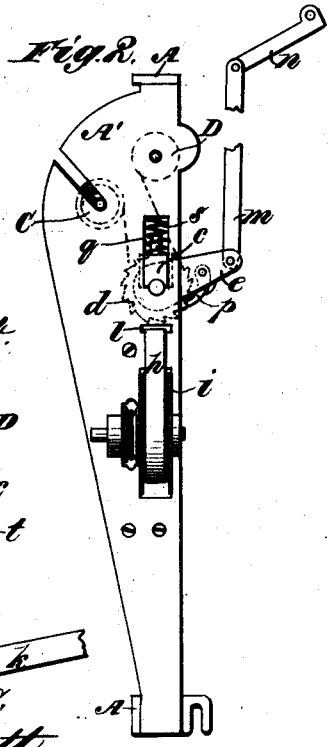


Fig. 3.

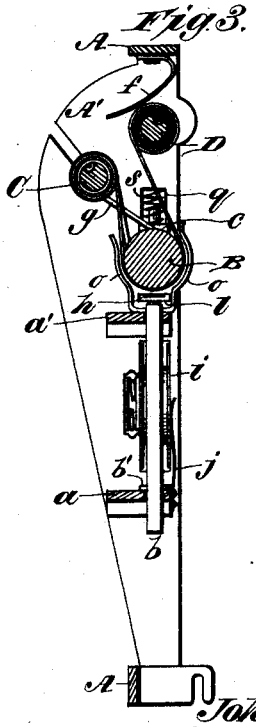
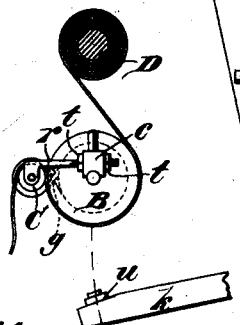


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN F. PFEFFER, OF CINCINNATI, OHIO.

PRINTING-RECORDER.

SPECIFICATION forming part of Letters Patent No. 423,273, dated March 11, 1890.

Application filed August 17, 1889. Serial No. 321,104. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. PFEFFER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented new and useful Improvements in Printing-Recorders for Cash-Registering and other Apparatus, of which the following is a specification.

My invention relates to printing-recorders, and is applicable as an attachment to "cash-registers," the object in such case being to provide a means of printing a record of the registering action.

It consists in the construction and arrangement of a paper-feeding and printing mechanism, which, when attached to a cash-register, is actuated by the register mechanism to produce a continuous record, useful both as a check against any irregularity in the action of the register itself or as a separate record of its action during a given period—as, for instance, to indicate the "run" of the business in which it is employed. It may also be constructed and used independently as a registering device.

Mechanism embodying my invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation at the side of its attachment of the device as adapted to a common type of cash-registers, employing as the initial prime movers a series of actuating key-levers arranged similarly to piano-keys in a common horizontal plane, the printing device being attached to the back of the registering apparatus; Fig. 2, an end elevation; Fig. 3, a vertical cross-section at a central point, and Fig. 4 a detail view of a slight modification of structure relating to the feeding-out function of the paper strip and the arrangement of the types.

Referring now to the drawings, A A′ designate a rectangular frame having cross-bars A at top and bottom and guide cross-bars *a a′* between, all connecting the side plates A′ A′, which are somewhat widened at their upper part to admit the roller and other bearings hereinafter referred to. Through the intermediate guide-bars *a a′* in suitable guide-slots are arranged the series of vertical type-bars *b*, held at proper height by pins or projections *b′*, resting upon one of the guide-bars, as *a*, or otherwise, as may be convenient. The type-bars are spaced apart to correspond with and rest in the vertical paths of the key-levers *k* of the registering apparatus, and at such height above the same as to be struck and elevated by the keys at the close of their registering action through a small space sufficient to insure the proper impact and drive the type-bars upward against the paper-roll, as hereinafter explained.

Each type-bar carries at its upper face its proper type character, the series being arranged to impinge against the peripheral face of a cylindrical roller B, of wood, paper, rubber, or other suitable material, in the radial plane of its axis. The roller B is journaled in and between the side plates A′ in short vertical slots of each plate, in which plays a journal cap or block *c*, held down by a spiral spring *s*, thus allowing a limited upward play of the roller under the impact of the types.

Two other rollers C D are provided, journaled in the side plates A′ above the printing-roller, one of these, as D, being the supply-roll, and the other, as C, the rewinding-roll, these being of any convenient size and construction to wind and unwind the paper strip in the ordinary manner. The initial operating-power I have shown applied in the present case to the printing or impact roll B by a ratchet-wheel *d*, attached at one end thereof, having a loose concentric arm *e* oscillating adjacent thereto and carrying a pivoted spring-pawl *p*, engaging its ratchet-teeth in one direction and trailing over them in reverse, thus moving the roll always in the same direction.

The supply and rewinding rolls are situated in relation to the printing-roll so as to allow the paper strip to form a loop around the printing-roll, as indicated by the dotted lines in Fig. 2. The supply-roll is provided with a brake—for example, a leaf-spring *f*—attached to the upper cross-bar A and lying against the peripheral face of the roll, and is actuated against the retarding friction of the brake by the movement of the roll B and its pull upon the paper strip as a belt. In addition to these parts I provide a crossed belt *g*, connecting the roll B with the roll C outside the casing, whereby the rewinding is effected simultaneously by the same initial power. I

make the engaging pulley-surface upon the roll C of smaller diameter than that of the roll B, to produce a more rapid rotation (controlled by the slip of the belt) of the rewinding-roll, so as to keep the paper strip taut upon the roll B for the proper action of the types. Across the upper faces of the types I carry a suitably-inked ribbon *h*, wound upon bobbins *i*, journaled crosswise in openings of the end plates A′, one or both of said bobbins being provided with friction-brakes *j*, of any suitable character to produce a retarding action and retain the ribbon reasonably taut across the type-faces. The bobbin-journal bearings are preferably carried at the outer sides of the plates A′ below the line of type-faces, and the ribbon is passed through guide-slots *l* at the level of or slightly above the type-faces and across the same through the side plates A′.

The initial power for the movement of the paper-roll is given through the terminal crank-wrist of the arm *e* by a connection with some moving part of the registering mechanism or to any other suitable source, according to the use and apparatus to which the printing mechanism is applied, such source producing by a reciprocating movement of a link, such as *m*, an intermittent partial rotation of the arm *e* or oscillation and a corresponding action in one direction of the roll B at such times as avoid interference with the action of the types.

In the illustration, Fig. 2, I have shown the link *m* connecting the arm *e* with the free end of a pivotal "wing" *n*, which may be understood as indicating any moving part of a registering apparatus capable of giving the required power to lift the arm *e*, trail the pawl *p* over the ratchet *d*, and by its return or contrary movement actuate the ratchet and the roll B by the engagement of the pawl. As the wing in registering apparatus is moved upward by the direct lifting action of the keys, (which also actuates the type and performs the printing action,) the setting forward of the paper strip to present a new surface to the type will follow immediately after the printing in each case. I may provide curved guide-fingers *o*, extending upward from (attached, for example, to the upper guide-bar *a*) at both sides of the roll B at proper intervals, to aid in retaining the paper strip in proper relation to the printing-roll; also, I make the journal-bearings of the rewinding-roll C in open slots *q*, extended outward through the plates A′, as shown, to permit the removal of the roll for removal or inspection of the record. I may also connect the bobbins *i* by a crossed belt for convenience in shifting the ribbon longitudinally by rotating one of the bobbins by hand.

In Fig. 4 I have shown a modification of the position and functions of the roll C, which in this case is carried upon side bearing-stems *r*, projecting from and held adjustably in the cap-blocks *c* by screw-nuts *t*. By this adjustability the roll C is brought into frictional contact with the face of the roll B, and, being driven in opposite directions by the crossed belt *g* already described, thus in rolling contact, the paper strip is carried between said contact-surfaces and fed outward without being wound upon the roll C, as in the first-described construction. The mechanism just described is employed where it is intended to sever portions of the free end of the paper strip from time to time—as at the end of each day—to file or use independently of the machine. The portion of the case containing the printing devices may be entirely separate from the remainder and provided with an independent lock, to the exclusion of the attendant who manipulates the register. I have also in this modification shown the types as mere blocks *u*, attached directly to the upper surfaces of the register-keys. This involves the omission of the type-bars as separate elements of the mechanism, but no other change further than to bring the rolls down to the proper level.

The operation of the device has been sufficiently indicated in the course of the description. I may remark in conclusion (to prevent misunderstanding) that the printing mechanism shown is capable of use as an independent organization apart from a registering apparatus by the employment of a bank of key-levers such as indicated, with a wing or other suitable mover operated thereby to perform the proper shifting of the paper strip, constituting, in effect, a printing-register, omitting the register-wheels and other indicating devices usually employed in registering-machines. I may also dispense with the inking-ribbon and substitute therefor a "carbon" or other pigment surface of paper or cloth upon the surface of the impact roll or bar. The action in such case will be the same, except that the opposite side of the paper will be acted upon.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. The combination, with a cash-register having a horizontal series of registering-keys and rear projections thereon, of a printing-recorder embodying the following elements, viz: a supporting-frame adapted to be secured to the rear of the cash-register above the key-levers, a paper-roll or other impact-surface arranged in said frame, a series of types actuated by said keys, respectively, against said impact-surface, an inking-ribbon interposed between said type and the impact-surface, feed-rolls, and mechanism for holding a paper strip and feeding the same in fixed lateral limits across said impact-surface, and mechanism connecting said feed mechanism with the moving part of the register for actuating the paper strip.

2. The combination, with a cash-register having a horizontal series of registering-keys and rear projections thereon, of a printing-recorder embodying the following elements, viz:

a supporting-frame adapted to be detachably secured at the rear of the cash-register above the key-levers, guide-bars across said frame, a series of type-bars held and guided in said guide-bars above the key projections of the register so as to be actuated by the key-levers toward the closing limit of their movement, an inking-ribbon carried across the upper terminals of the type-bars, an impact-surface carried in said frame above the ribbon, and paper-rolls provided with mechanism for feeding a paper strip in fixed lateral limits across said impact-surface and connecting with the register apparatus for actuating the feeding-rolls, substantially as set forth.

3. The combination, with registering apparatus of the character described, of a supporting-frame adapted to be secured thereto at the rear, a series of type-bars mounted and guided in said frame in striking relations with the key-levers, an inking-ribbon carried across the upper faces of the type-bars, a paper-feed roller journaled across said frame as an impact-face for the types, paper-supply and rewinding rolls journaled in such relation to the impact-roller as to pass the paper strip in a loop around the latter above the ribbon, a power-transmitting connection between the impact and rewinding rollers, and a driving-connection between said feed-roll and a suitable operating part of the register apparatus, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN F. PFEFFER.

Witnesses:
EWELL A. DICK,
L. M. HOSEA.