

R. A. HART.

COUNTING APPARATUS FOR PRINTING PRESSES, &c.

No. 489,078.

Patented Jan. 3, 1893.

Fig. 1.

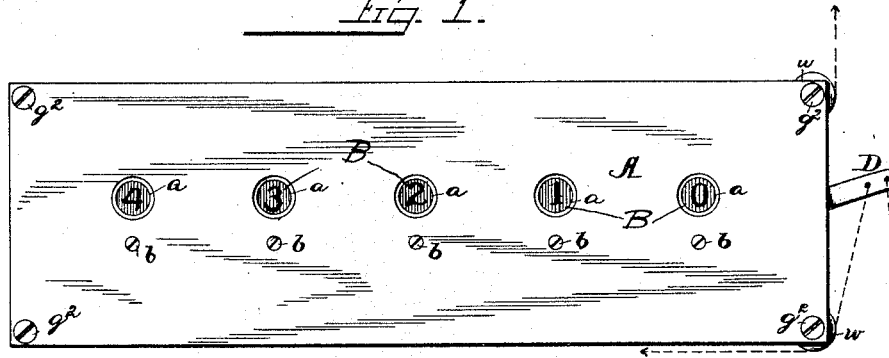


Fig. 2.

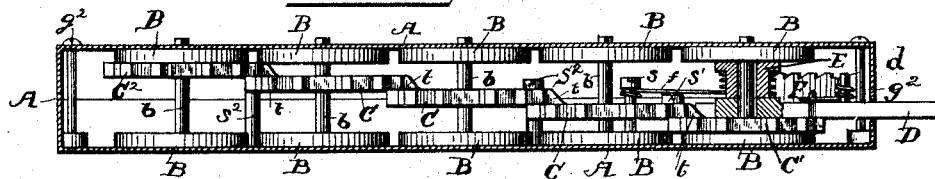
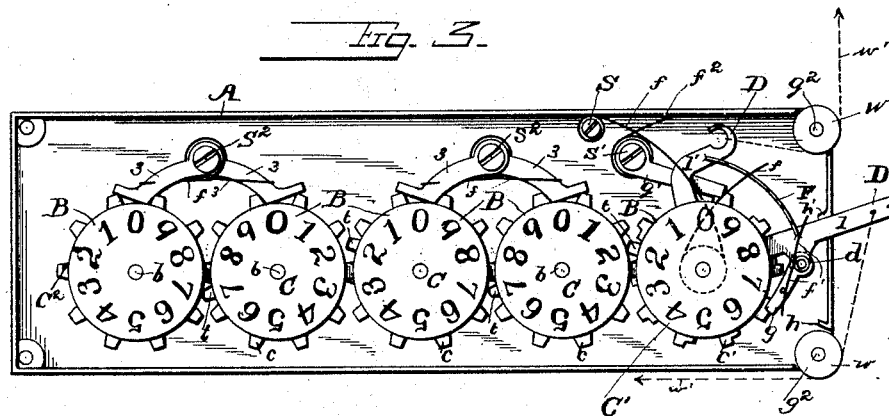


Fig. 3.



Witnesses

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Fig. 4.

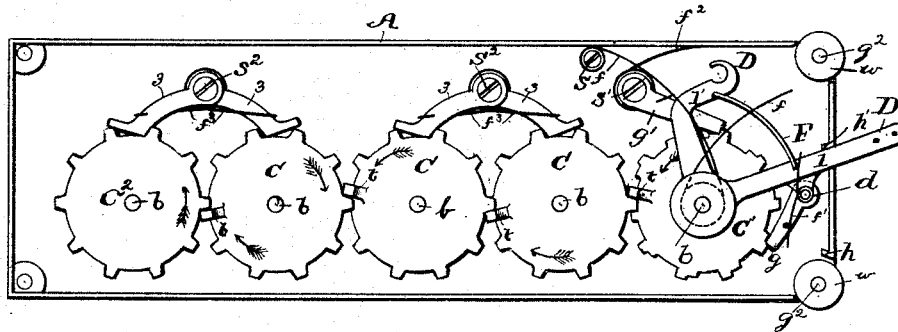


Fig. 5.

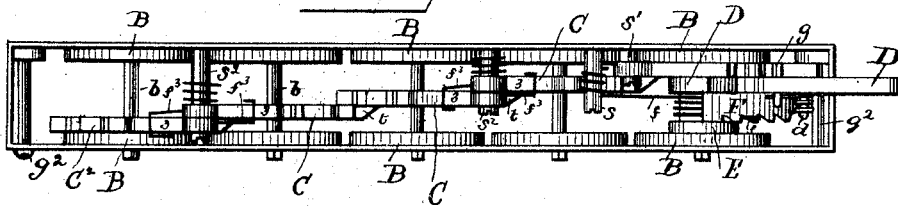


Fig. 6.

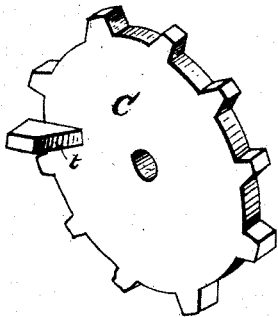


Fig. 7.

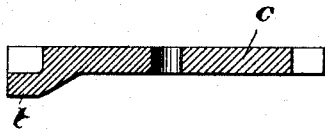


Fig. 8.

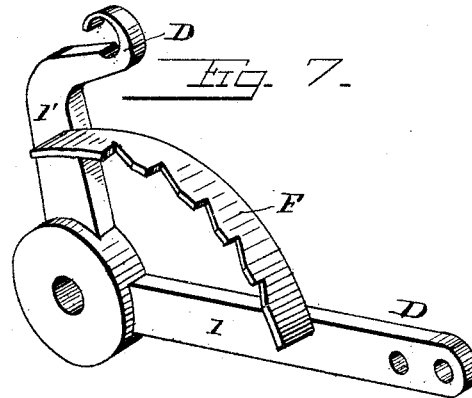
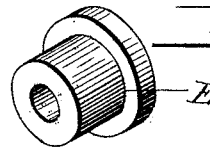


Fig. 9.



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# UNITED STATES PATENT OFFICE.

RUSSELL A. HART, OF BATTLE CREEK, MICHIGAN.

## COUNTING APPARATUS FOR PRINTING-PRESSES, &c.

SPECIFICATION forming part of Letters Patent No. 489,078, dated January 8, 1893.

Application filed March 26, 1892. Serial No. 426,545. (No model.)

*To all whom it may concern:*

Be it known that I, RUSSELL A. HART, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Counting Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to that class of counting apparatus designed for use more particularly in connection with the printer's press, for counting and registering the number of sheets printed; but the counter is equally adapted to automatically register the number of lineal yards of cloth, measures of grain, or divisions to which use counters and meters may be put.

My present invention has for its objects the providing of a compact, convenient, and durable counting and registering apparatus adapted to take the place of many of the complex and costly counters heretofore employed for similar purposes, and it consists in certain peculiarities in the construction, arrangement, and combination of the several parts, substantially as hereinafter described and particularly set forth in the subjoined claims.

In the drawings, forming part thereof, and in which the same numerals and letters of reference designate the same or like parts in all the views, Figure 1. is a side view of the counting and registering apparatus, mounted in proper position for use. Fig. 2. is a view of the device turned down on the side thereof, having the top and bottom walls of the casing removed, in order to the more clearly show the relative position, office, and manner of operation of the several parts located within the casing chamber. Fig. 3. represents a view similar to Fig. 1, save that in the latter, the front side of the casing is removed; showing the series of dial disks on the one side of the chamber, and the series of shafts carrying the series of intermediate, or train of toothed wheels, and engaging, flexibly held dogs, or detents, and other co-acting parts

within said chamber. Fig. 4 is a side elevation with the front wall of the casing and a train of dial disks removed. Fig. 5 is a view similar to Fig. 2 but looking at the parts from the opposite end. Fig. 6 is an enlarged detail view in perspective of one of the wheels C. Fig. 7 is an enlarged detail view in perspective of the lever and quadrant plate. Fig. 8 is an enlarged sectional view of one of the dial wheels and Fig. 9 is an enlarged detail view in perspective of the spool.

Referring to the letters and figures of reference A, represents the casing; of sufficient interior dimensions to afford suitable chamber space for the operative, and other parts located therein.

B, represents a double series of dial disks, fixed on transverse shafts, *b*, and bearing figures 1, 2, 3, &c.—so placed on their outer surfaces as to exactly register with the double series of windows, *a*, of the casing; as the disks are rotated,—the registering figures corresponding in number with the regular circumferential cogs, or teeth, of a series of wheels C, C, C, C', C<sup>2</sup> also fixed on said transverse shafts, *b*, whose end bearings are formed in the side walls of the casing below the windows, *a*, thereof. One or both ends of the shafts, *b*, are slotted, or squared, for engagement of a "key," for setting and adjusting the registering dials, as occasion requires. The outer faces of the dial disks are fixed on the end portions of the shafts in such manner that the faces looking out of the windows of the casing in opposite directions shall rotate close to the inner walls thereof; while the inner, plain surface of the disks located at the opposite ends and sides of the casing, shall run in close contact with their adjacent toothed wheels.

The wheels C, C, C, C', C<sup>2</sup>, are located out of longitudinal alignment with each other by exactly the thickness of a wheel, so that their circumferential cogs or teeth cannot intermesh.

Projecting from the inner face, or surface of the toothed wheel, C', and located between two of its circumferential cogs, or teeth, is the projecting tooth, *t*, and on the corresponding next adjacent wheel C, is a similar fixed tooth *t*, and so on throughout the series running to the left, until the wheel C<sup>2</sup>, is reached; which

wheel need not have the tooth  $t$ , whose only office is, to engage, at each revolution thereof, in the direction pointed by the arrows, with the regular circumferential cogs of the next adjacent wheel to the left hand thereof, for the purpose of automatically carrying the tens from any one disk to the next one to the left thereof, as hereinafter more particularly appearing.

D, represents the bell crank lever having arms  $l$ ,  $l'$  and cord engagements, whereby motion is communicated to the counting apparatus from the printer's press, or other power employed. The arm  $l$ , of this lever D, projects through a vertical slot in the right hand end of the casing; at the bottom and top of which slot, are stops  $h$ ,  $h'$ , by which means the throw of the lever is limited in its reciprocations, on its pivotal fulcrum formed on the first shaft  $b$ , at the right hand end of the casing chamber. Located on the same shaft  $b$ , and filling the space between the lever D, and the dial disk B, farthest from said lever on said shaft, is a spool E, loosely embracing said shaft, and wound around said spool in several coils, is the lever returning spring  $f$ , the fixed end of which is secured to the inside, and near the top of the casing, by means of a securing screw S. The free, or adjustable, opposite extremity of said returning spring, engages notches or teeth, of a quadrant plate, F, connecting the arms,  $l$ ,  $l'$ , and forming part of, or made integral with, the lever D. The lever arm  $l$ , carries a pivoted pawl  $g$ , on its lower side; and this pawl is flexibly held to engagement with the notched circumferential teeth of the wheel  $C'$  at the right hand side of the device by means of the spring  $f'$ , having a coil around the pivotal post,  $d$ , of said arm  $l$ , and with its fixed extremity attached to said arm adjacent to the end of the quadrant plate F, or in any suitable manner. Situated about opposite to the lower right hand corner of the casing chamber, and above the first shaft  $b$ , just referred to, is a retaining dog, or detent,  $g'$ , having its free end flexibly held to engagement with the notched teeth of the said first wheel  $C'$ , at the right hand end of the chamber, by means of the spring  $f^2$ , whose central coil winds around the fixed pivotal point  $s'$ , on the side wall of the casing.

Twin detents, or dogs, 3, 3, are independently pivoted to the inside walls of the casing suitably above the two pairs of toothed wheels located at the left of the wheel  $C'$ ,—including the wheel  $C^2$ ,—the free ends of which detents are flexibly held to engagement with the circumferential teeth of their respective wheels by means of springs  $f^3$ , whose central coil loosely embraces the fastening posts  $s^2$ , while their extremities engage the outstretched detent arms in such manner that the ends of said detents independently engage with said circumferential teeth and hold the wheels in proper position.

Situated at the right hand end and near the

top and bottom of the casing chamber, and utilizing the securing bolts  $g^2$ , for bearings, are wheels, or pulleys,  $w$ , and passing over these from convenient attachments to the lever arms  $l$ , and  $l'$ , are cords  $w'$ , extending from presses or other machinery situated at various distances and in various directions from the counter, for the purpose of operating the same; and whereby the registering may be observed from either side thereof. Said presses or machines may be so started that their pulsations or strokes will be in consecutive order, in which case my device will disclose the entire number of pulsations or strokes made, or their strokes may be simultaneous in which event the machine will register only the number of strokes made by each, and to find the total number of strokes made it will be necessary to multiply that registered by the number of presses or machines to which the register is coupled.

The mode of operation of this novel invention is as follows:—Setting the registering wheels in the positions shown in Fig. 3, by means of turning the shafts  $b$ , with the "key" thereof, will place the cyphers  $o$ , looking out of the double series of windows  $a$ , of the casing, with the series of single teeth  $t$ , of the several toothed wheels  $C'$ ,  $C$ ,  $C$ , &c., ready for engagement with the regular circumferential teeth of its next adjacent wheel at the left after one revolution of the first, and so on, in the ratio of ten, as the counter shafts and engagements are rotated, by means of the regular, or irregular reciprocations of the lever D, the several flexibly held dogs and detents serving to detain the dial numerals in exact registration with the windows of the Janus-faced casing, as clearly appearing in Fig. 3. The tension of the lever returning spring  $f$  being of primary importance, to insure the prompt action of said lever, the same may be regulated by means of the adjustable arm of the returning spring  $f$ , at any point of the plate F as seen in Figs. 2—3,—7.

Having thus fully described and illustrated my novel Janus-faced counting and registering apparatus, and pointed out its mode of operation, together with some of its advantages, what I claim, and desire to secure by Letters-Patent of the United States is—

1. In a counting apparatus, the combination with the casing, dial disks, toothed wheels, and means for turning said wheels a part of a revolution at the end of every complete revolution of the preceding wheel, of a bell crank lever, carrying a pivoted pawl adapted to engage the first toothed wheel and turn the same a part of a revolution at each reciprocation of said lever, a quadrant plate connecting the arms of said bell crank lever, a spring having one end fixed to the casing, its opposite end adjustably engaging said quadrant plate, and its intermediate portion coiled, and dogs flexibly held to the teeth of said wheels.

2. In a counting apparatus, the casing,

transverse shafts mounted therein, and dial disks on said shafts, in combination with a series of circumferentially-toothed wheels also mounted on said shafts, said wheels being mounted out of longitudinal alignment with each other, lateral teeth  $t$  each adapted to engage the circumferential teeth of the next wheel, a bell-crank lever fulcrumed on the end shaft, a spool loosely mounted on said shaft between said lever and the disk, a quadrant plate between the arms of said bell-crank lever, a spring having one end fixed to said casing its intermediate portion coiled around said spool, and its free end adjustably engaging said quadrant plate, and dogs flexibly held to the teeth of said wheels.

3. The combination with the casing, transverse shafts therein and dial disks and toothed wheels on said shafts, of a bell-crank lever fulcrumed on the end shaft, a spool loosely mounted on said shaft between said lever and the dial disk, a quadrant plate between the arms of said bell crank lever, a spring having one end fixed to the casing, its intermediate portion coiled around said spool and its free end adjustably engaging said quadrant plate, and dogs flexibly held to the teeth of said wheels.

4. In a counting apparatus, a casing, provided with windows  $a$ , in the opposite sides thereof, a series of transverse shafts  $b$ , having bearings in the sides of the casing.—a double series of numbered disks on said shafts, placed with their numbers so as to register with said windows as the shafts are rotated, intermediate toothed wheels fixed on said shafts, a lever  $D$ , provided with arms and cords connecting said lever with presses or other machinery, whereby the registering of the count may be observed at either side of said apparatus, substantially as shown, illustrated and described.

5. In a counting apparatus, the Janus faced casing, the series of transverse shafts therein having end bearings in the walls of said casing, a double series of dial disks fixed near the ends of said series of shafts on the inside chamber of the casing, said dials carrying

registering numbers, that look out of the windows  $a$ , of both side walls of the casing, as the disks are rotated, a series of toothed wheels fixed on said shafts intermediately between said dial disks, flexibly engaging dogs or detents, for each of said toothed wheels, a lever, provided with hinged and flexibly held dog, and an adjustably fixed returning spring, having coils around the pivotal bearing of said lever, lever arms,  $l$ , and  $l'$ , and cords  $w'$ , running over wheels  $w$ , having bearings within the casing, extending from said arms and adapted to connect the same with a press or presses whereby the pulsations of a press or presses located in various directions and at different distances, may be noted by the operator wherever situated; and without disturbing the fixed location of the counting apparatus, the presses, or other motive machinery, all constructed, arranged and operating, substantially as set forth, and for the purposes described.

6. In a counting apparatus, the casing, provided with windows  $a$ , in both sides thereof, a series of transverse shafts  $b$ , having end bearings in the side walls of the casing, a series of dial disks  $B$ , fixed on said series of shafts near the outer end bearings thereof, carrying, on their outer faces numerals registering with said windows, a series of intermediate toothed wheels  $C$ , fixed on said shafts, flexibly held dogs, or detents engaging the teeth of wheels  $C$ , a lever  $D$ , and a spool  $E$ , on the shaft  $b$ , at the initial end of the series, said lever having arms  $l$ , and  $l'$ , projecting from its pivotal center, a notched plate  $F$ , a returning spring  $f$ , having central coil around said spool  $E$ , and cords  $w'$ , extending from said lever, the whole arranged and operating substantially in the manner and for the purposes shown and described.

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

RUSSELL A. HART.

Witnesses:

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GEO. W. NICHOLS.