L. S. MATURIN.

COUNTING DEVICE.

APPLICATION FILED DEC. 27, 1920.

1,403,182. Patented Jan. 10, 1922.

2 SHEETS—SHEET 1.

FIG. 1

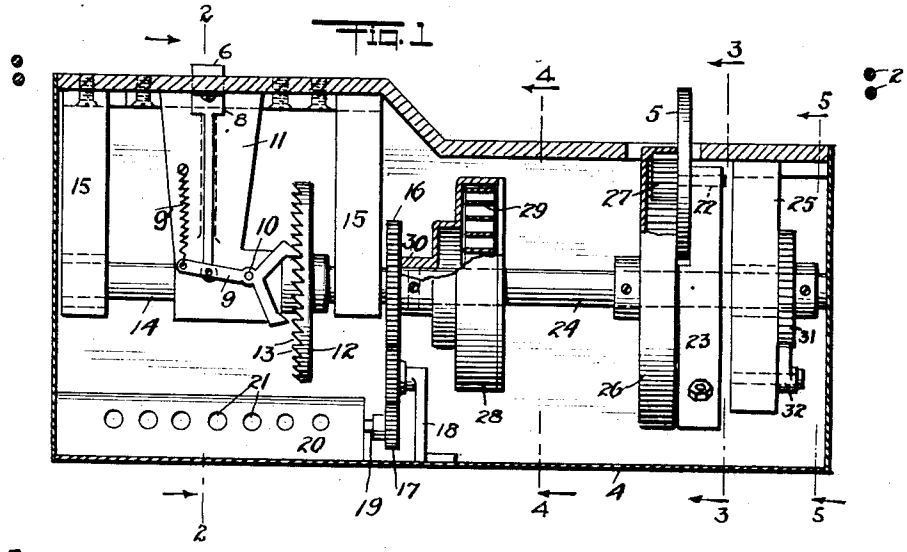


FIG. 6

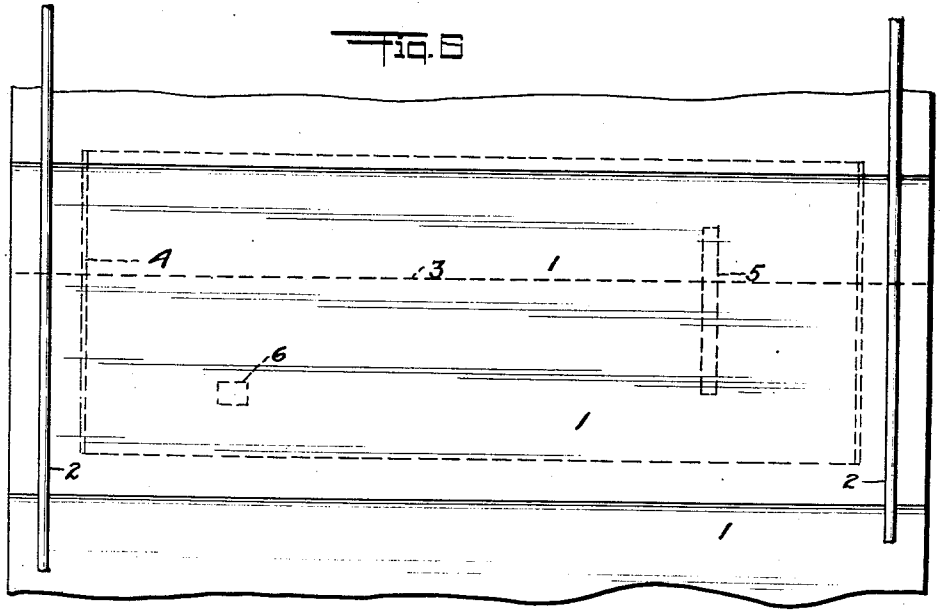
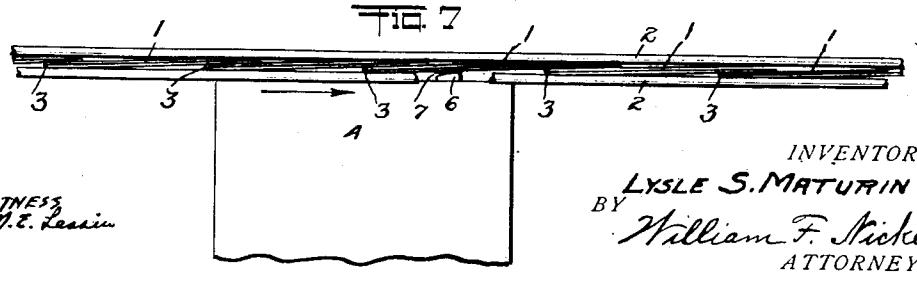


FIG. 7



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2 SHEETS—SHEET 2.

Fig. 2

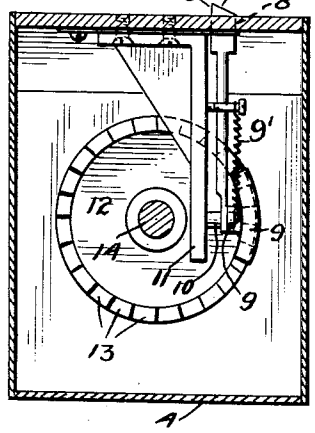


Fig. 3

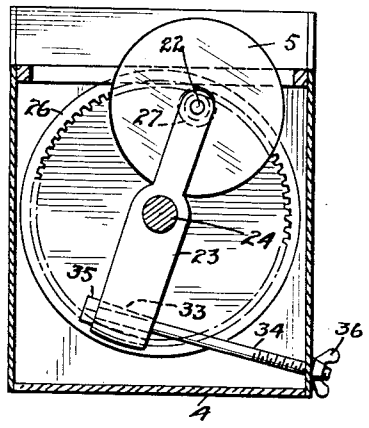


Fig. 4

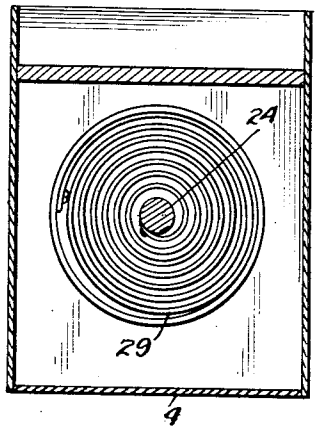
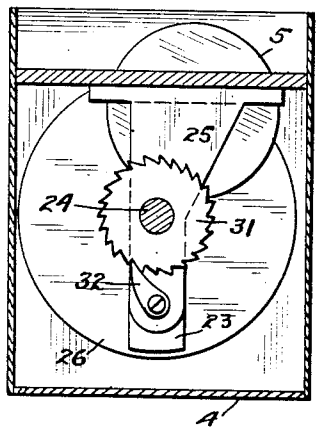


Fig. 5



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UNITED STATES PATENT OFFICE.

LYSLE S. MATURIN, OF BROOKLYN, NEW YORK.

COUNTING DEVICE.

1,403,182. Specification of Letters Patent. Patented Jan. 10, 1922.

Application filed December 27, 1920. Serial No. 433,449.

To all whom it may concern:

Be it known that I, LYSLE S. MATURIN, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Counting Devices, of which the following is a specification.

This invention relates to an improved counting device; particularly a counting device for indicating the number of newspapers delivered by a printing press after the press has printed and folded the papers.

The general object of this invention is to provide a counting device which will serve the purpose mentioned and which is mechanically operated; consisting of but few parts, and being simple in construction, not liable to get out of order, and easy to mount so as to be caused to function as required. A further object of this invention is to provide a counting device capable of being actuated mechanically to record the number of newspapers printed; and designed to receive and store the energy consumed by it; whereby the device is self-contained and complete, both as to structure and mode of operation; and never runs down when in use, but on the contrary always remains in operative condition and in readiness for instant and continuous service.

Other objects and advantages of this invention are set forth in the following description, taken with the accompanying drawings; and the novel features of the invention are defined in the appended claims. This disclosure, however, is illustrative only and sets forth merely the best embodiment of my invention now known to me; and I may vary what is actually shown herein; especially as to shape, size and arrangement of parts, without departing from the nature and scope of the invention as the same is delineated by the broad meanings of the terms in which the claims are expressed.

On the drawings:—

Figure 1 is a side view showing the mechanism of a counting device according to my invention; the said mechanism being mounted in a suitable casing or box;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 1;

Figure 5 is a section on the line 5—5 of Figure 1;

Figure 6 is a top plan of the casing for the counting device showing how the counting device is mounted when in service, with respect to the newspapers to be counted by it; and

Figure 7 is a view, more or less diagrammatic, showing, in end elevation, substantially what appears in Figure 6.

The same numerals identify the same characters throughout.

As is well known, the presses employed in news establishments not only print the papers but also fold them; and after being printed and folded the newspapers are caused to move from the press to a point where they are collected for distribution. In Figures 6 and 7, I indicate at 1 a number of folded newspapers arranged one behind the other and traveling in guides 2. These papers may consist of any number of sheets or pages; the sheets or pages of each paper being one on top of the other and each copy of the paper being then folded across the middle in the usual way, the upper half of the page thus being laid down upon the lower half and the guides 2 engaging each copy along the edges thereof at each side. The numeral 3 indicates the line along which the newspapers are folded across the middle in the manner specified, this line being the transverse center line of each copy, and, as the copies are disposed in the guides 2 to be moved away from the press, this line also indicates the rear edge of each of the copies which follow each other in succession; and the forward edge of each copy will overlap the rear edge 3 of the one ahead of it. Hence the lower face of the line of papers, by reason of the well defined rear edges 3, presents a transversely ribbed or stepped appearance, which is utilized in the practice of my invention in a fashion that is described fully hereinafter. The printing press is not shown and the guides 2 may simply be wires arranged in pairs, one at each side of the moving line of newspapers, the members of each pair being one above the other so that the lateral edges of the successive papers are engaged between the wires of each pair at each side of the line, one wire being above and the other below the papers. For the purpose of this invention the wires may be either in motion or stationary, but in any event it is essential that the line of papers be kept moving for-

ward in the direction in which the guides 2 extend, with the front edge of each newspaper overlapping the rear edge 3 of the one ahead of it. My counting device is placed beneath the line of newspapers; and the motion of the papers acts to store power to operate the device; and a certain part or member thereof is especially actuated as each of the rear edges 3 passes it to cause a recording instrument mounted in the counting device to give the desired result.

The mechanism of the counting device is arranged in a casing or supporting framework 4, and comprises a friction wheel 5, and a plunger 6. Both the wheel 5 and the plunger 6 project above the top of the casing or framework 4 and the device is placed beneath the line of newspapers and beneath the guides 2 and it is held in such wise that both the wheel 5 and the part or member 6 will be in contact with the lower face of the newspapers. The dog or plunger 6 has its upper end 7, beveled in the direction from which the papers move and will slide up and down in a hole 8 in the top of the framework 4. The engagement of the papers will suffice to turn the wheel 5 and store up power in the counting device to keep it working; while as the rear edge of each folded copy slips past the beveled end 7 of the dog 6, this dog will be permitted to move in an upward direction, and the successive upward motions so control the various parts of the mechanism of the counting device that an exact count will be effected. To this end the dog 6 is caused to extend downward into the casing or framework 4, a suitable distance and at its lower end it is pinned to a double escapement pawl 9 pivoted at 10 upon a bracket 11; this bracket depending from the top of the framework or the casing and terminating at is lower end near a ratchet wheel 12 having a number of escapement teeth 13, on one face in position to cooperate with the pawl 9. This ratchet wheel 13 is rigidly mounted upon a shaft 14, mounted in bearings 15 secured to the framework or the casing 4; and a spring 9′ is affixed to both the pawl 9 and the bracket 11 so that it acts normally to impel the dog 6 upward and lift the adjacent end of the pawl 9. On the shaft 14 is a gear wheel 16 which turns a gear 17 either directly or through an intermediate gear mounted in a bracket 18. The gear 17 actuates a spindle 19 in a small housing 20 which contains a register. The housing 20 may have openings 21 in the side thereof through which numbers can be shown and from this recorder a reading can be taken at any time to ascertain the number of papers which the press has printed and folded and delivered.

The operation of the counting device will now be clear because when it is set beneath the line of moving papers so that the papers slide along in contact with the beveled end 7 of the dog 6, whenever one of the transverse rear edges 3 of each of the papers passes this dog 6, the spring 9′ can impel the dog upward for a slight distance. In consequence the pawl 9 will be turned through a slight angle and the lower tooth thereon will release one of the teeth 13 of the gear 12, which will turn a distance of one tooth before this ratchet gear is engaged by the upper tooth of the pawl 9, and temporarily arrested. Then the dog 6 is depressed slightly against the tension of the spring 9′, whereby the upper tooth of the pawl 9 will release the gear 12 and the lower tooth of the pawl 9 will re-engage with this gear. When the rear edge 3 of the next copy slips behind the beveled end 7 of the dog 6, the spring 9′ is again able to impel the dog upward, slightly, moving the pawl 9 with the same effect as before. Through the gearing 16 and 17 the movement of the ratchet gear 12 is communicated to the spindle 19 of the recorder 20; and if the ratchet gear 12 has 50 teeth for example, every time this gear turns once, 50 papers will have passed in and the number "50" will then appear at one of the openings 21 on the recorder 20 so that a reading can be taken. Of course any suitable recorder may be employed.

As stated previously this counting device is actuated by power supplied by the motion of the newspapers themselves through the friction of the papers upon the wheel 5. This wheel is mounted on a spindle 22 carried by a suitable arm 23 which is supported by another shaft 24 arranged in line with the shaft 14. This shaft is mounted at one end in a bearing 25 secured to the framework or casing 4 and it has secured thereon an internal gear 26 which meshes with a small pinion 27 secured on the spindle 22. The friction of the papers against the rim of the wheel 5 will rotate the gear 27 and gear 26 and thus turn the shaft 24. The revolution of the shaft 24 is stored up as energy in a drum 28; the latter containing a spiral spring 29. As indicated in Figure 1 the shaft 24 extends into the drum 28; and as will be understood one end of the spring 29 will be attached to the shaft 24 and the other to the inside of drum 28. The shaft 24 extends into a hub 30 on the drum and terminates short of the adjacent extremity of the shaft 14. I of course make the hub 30 of the drum 28 rigid with the gear 16 and shaft 14, but the shaft 24 which extends into the hub 30, can turn in this hub, which serves as a bearing for the shaft 24. Hence as the friction of the lower faces of the newspapers against the wheel 5 turns this

wheel and transmits motion through the gears 26 and 27 to the shaft 24, the spring 29 will be wound up and the force of this spring will rotate the shaft 14 and gear 12 whenever the teeth 13 are released by the pawl 9. At the opposite end of the shaft 24 I secure a rigid ratchet wheel 31 which cooperates with a spring pawl 32 secured adjacent the lower end of the bearing 25. This pawl and ratchet permit the shaft 24 to be turned in one direction only, which is the direction given by the forward movement of the papers 1. Since the shaft 24 can never turn backward, the force of the spring 29 must always be exerted through the drum 28 to turn the shaft 14 so as to actuate the gear 12 and operate the recorder 20.

I am able to adjust the arm 23 by making a hole 33 through the lower extremity thereof to receive a bolt 34. This bolt has a head 35 which will engage one side of the arm at one end of the hole 33 and from this end the bolt passes into the hole 33 and out through the side of the casing 4 where it is to receive a nut 36. By turning this nut 36 the arm can be caused to swing in a counter-clockwise direction so as to hold the wheel 5 as tightly as is necessary against the lower surfaces of the papers to make them drive this wheel and keep the spring 29 under tension. Of course the head 35 of the bolt will be too large to pass through the hole 33 which must be large enough to clear the outside surface of the bolt passing through it.

With this construction I can keep the count of any number of newspapers delivered by a printing press merely by installing the counting device below the guides 2 in position to make the wheel 5 and dog 6 be frictionally engaged with the lower surface of the papers 1. The force of the spring 29 furnishes the power and in operation the device is so accurate that it keeps an exact tally of all the newspapers passing above it; and the mode of operation is certain and positive and the parts are relatively so few that the liability of the device getting out of order is practically eliminated. At the same time the device keeps itself in constant readiness for service because it gets the power needed to drive it from the motion of the newspapers above it. Hence no special arrangement to install the counting device is needed. It does not depend for its utility or operation from anything except the parts comprised in it.

In the practice of my invention the guides 2 may be vertical and the papers may travel either upward or downward. In either case the casing or framework 4 will be so disposed that the part 6 and the element 5 will press against the face of the line of papers showing the edges 3. Also the guides 2 may be horizontal and in this case the counting device will be placed below the line of papers.

For the purpose of illustration and for the sake of clearness only, I illustrate the papers as being engaged by only two pairs of guides 2. In practice however, more than two pairs of guides will be employed as some presses have as many as four and six pairs of guides, so that the copies are engaged not only along the opposite edges but also between these edges. However, to show more than two pairs of guides on the drawings is not thought to be necessary because the operation of my invention is the same regardless of the number of guides 2 which are employed. Usually these guides are in the form of endless loops of spring wire, or perhaps other material which passes over pulleys and are kept in motion thereby, so as to feed forward the copies of newspapers between the members of each pair of these guides, as will be readily understood.

When the newspapers move horizontally the openings 21 in the housing 20 will be in the side of this housing as shown in Figure 1; but when the papers move vertically up or down these openings may be in the bottom of the housing.

Of course, while I have just described my invention in connection with the counting of newspapers, it is of course, not limited to this particular mode of utilization, as I may also employ it for the counting of other articles as well.

Under certain conditions, other means than the element 5 which receives energy from the papers and stores it in the spring 29, may be employed to furnish the motive power to operate the device. In any case the function thereof is positive and accurate through the operation of the ratchet 12 and pawl 9 connected to the plunger 6, which is controlled by the articles to be counted.

Having described my invention, what I believe to be new and desire to secure and protect by Letters Patent of the United States, is:—

1. A counting device comprising a register to indicate the number of articles counted and an element operated by said articles to receive and store energy imparted to it by said articles to enable the register to be actuated.

2. A counting device comprising a part controlled by the articles to be counted, a register, connections between said part and the register to enable the recorder to act in unison with said part when said part is operated to indicate the number of said articles counted, and an element to receive and store energy imparted to it by said article, to enable the register to be actuated.

3. A counting device comprising a register to indicate the number of articles moving past a given point, and an element oper-

ated by the movement of said articles to receive and store energy imparted to it by said articles to enable the register to be actuated.

4. A counting device comprising a part controlled by the movement of the articles to be counted, a register, connections between said part and the register to enable the register to act in unison with said part when said part is operated to indicate the number of articles passing a given point, and an element operated by the movement of said articles to receive and store energy imparted by said articles to enable the register to be actuated.

5. A counting device comprising a register to indicate the number of articles counted, a spring to enable the register to be operated, and an element actuated by the articles counted to stress said spring.

6. A counting device comprising a plunger to be controlled by the articles to be counted, a register, an escapement pawl connected to the plunger, and a ratchet wheel engaged by the pawl to actuate the register.

7. A counting device comprising a plunger to be controlled by the movement of the articles to be counted, an escapement pawl connected to the plunger, a ratchet wheel to be engaged by the pawl, a register connected to the ratchet wheel to be driven thereby, a friction element to be engaged by the articles and receive energy therefrom, and a spring to be wound up by said element and to take effect by actuating the register.

8. A counting device comprising an adjustable friction wheel to be revolved by engagement with articles in motion to be counted, a shaft, gears connecting said wheel and said shaft, a drum rotatably mounted relative to said shaft, a spring connecting the shaft and the drum, a pawl and ratchet to enable the shaft to rotate in only one direction to wind the spring, a plunger to be controlled by the articles to be counted, an escapement pawl connected to said plunger, a second ratchet to be engaged by the pawl, said second ratchet being fixed with respect to said drum, and a register to be actuated by the movement of said last named ratchet.

In witness whereof, I have signed my name to this specification this 17th day of December, 1920.

LYSLE S. MATURIN.