Nov. 9, 1937. P. G. KRIPPNER ET AL 2,098,872

ELECTRICALLY CONTROLLED COUNTING MECHANISM

Filed Oct. 16, 1933 3 Sheets-Sheet 1

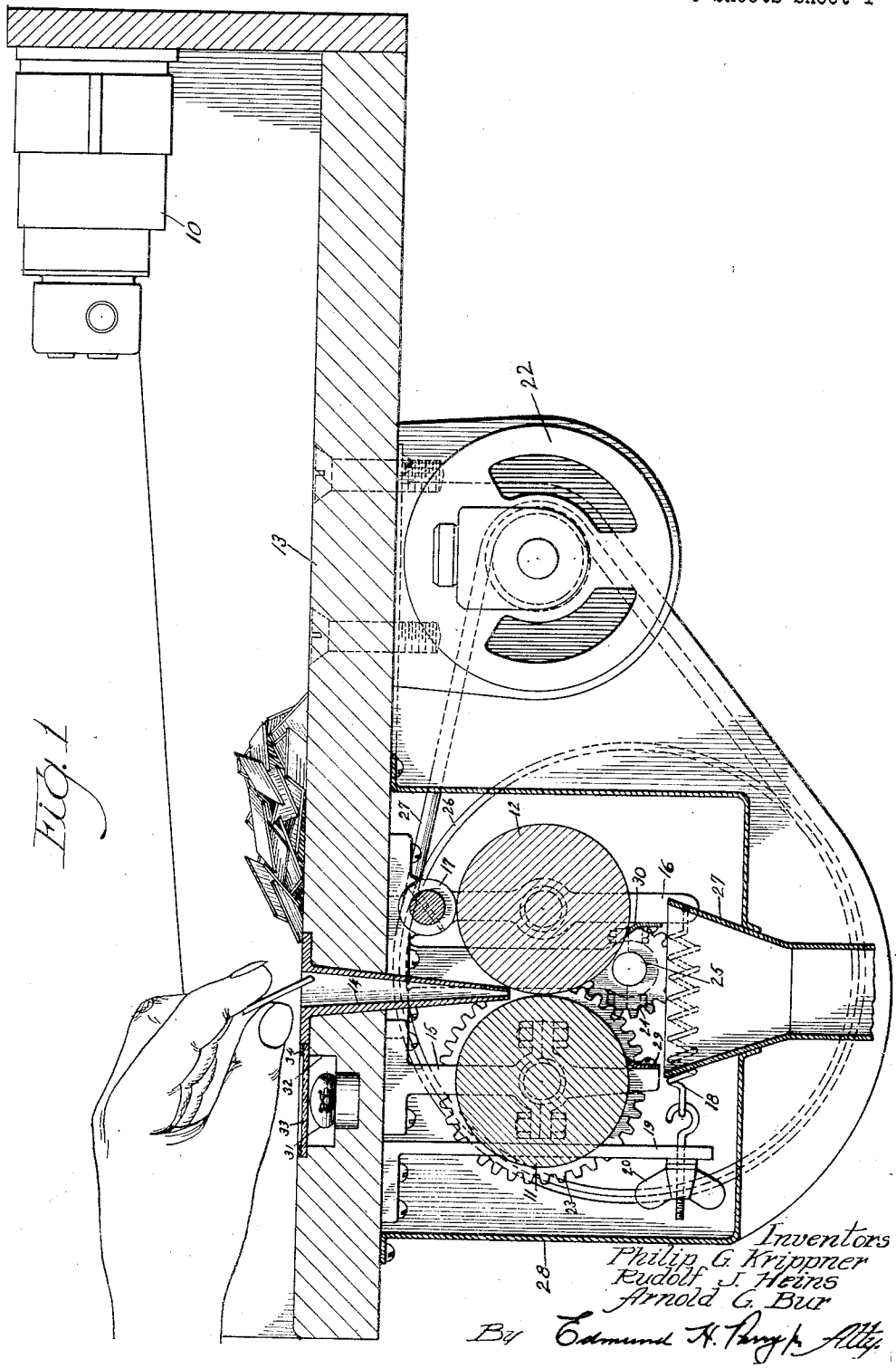


Fig. 1

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Filed Oct. 16, 1933 3 Sheets-Sheet 2

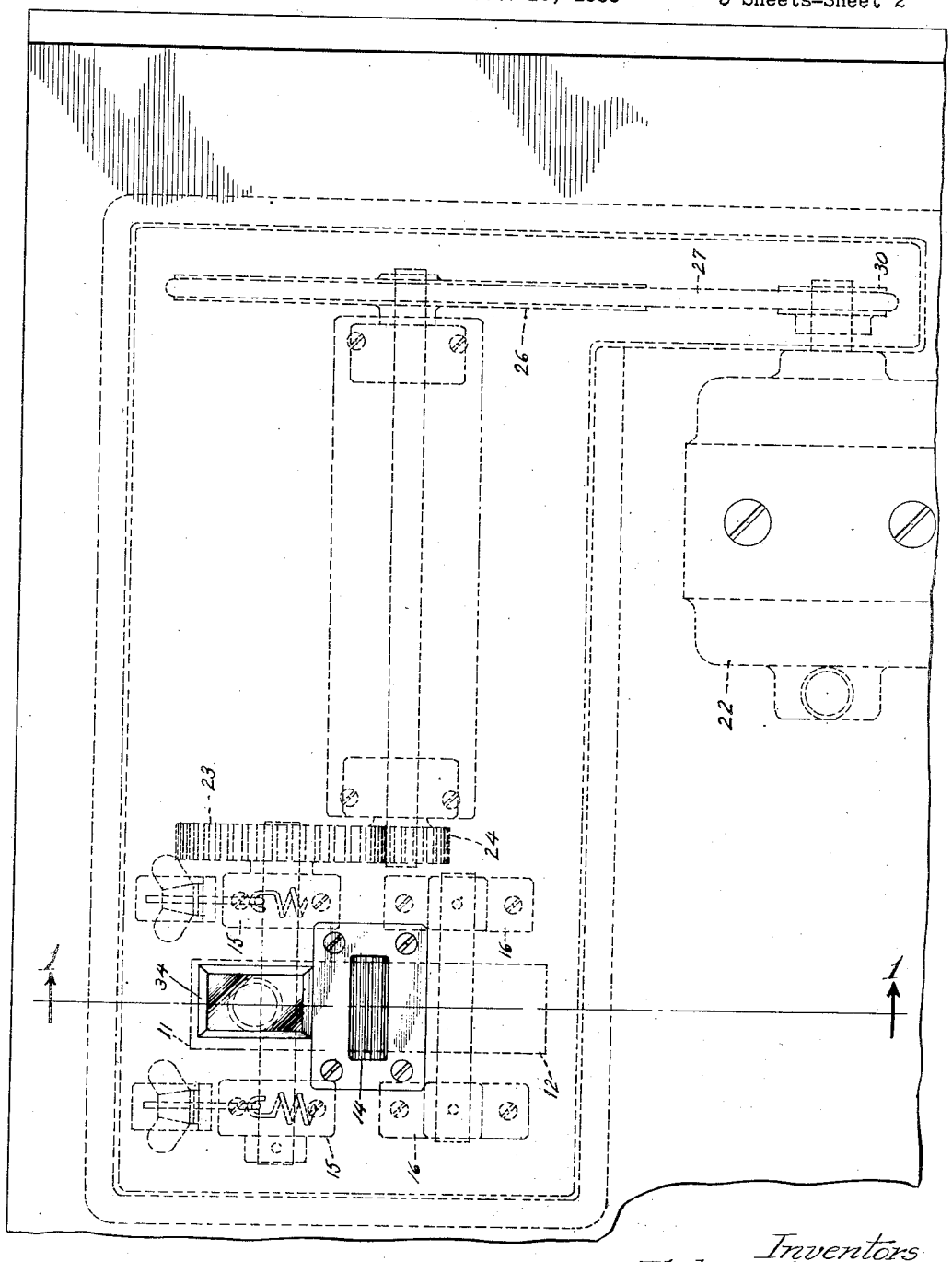


Fig. 2

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Filed Oct. 16, 1933 3 Sheets-Sheet 3

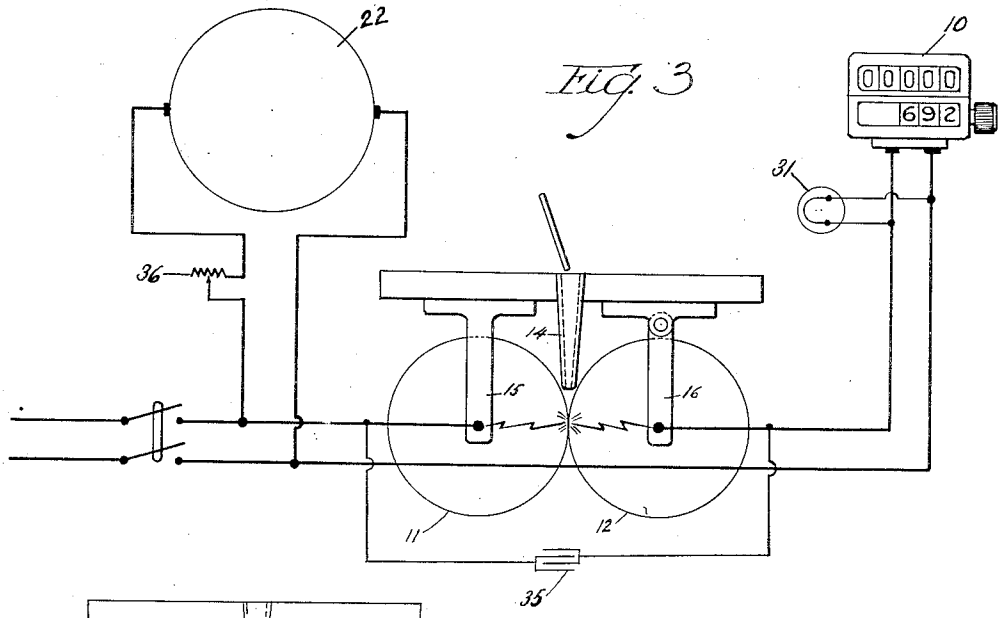


Fig. 3

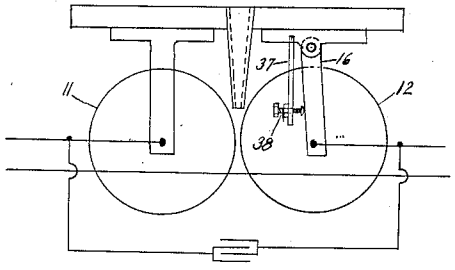


Fig. 4

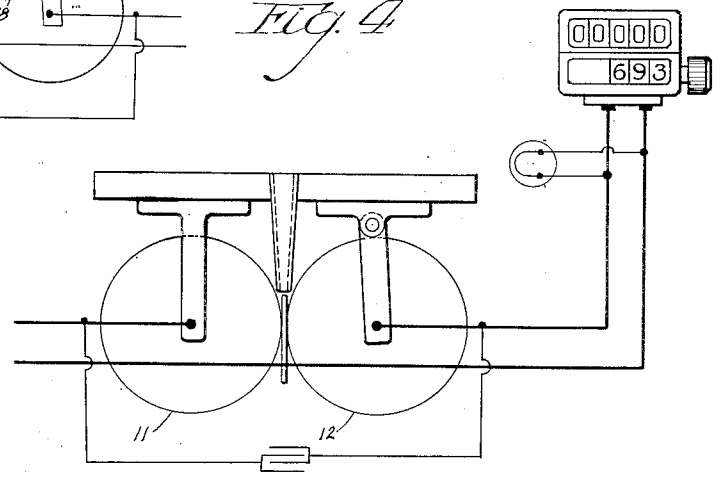


Fig 5

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UNITED STATES PATENT OFFICE

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ELECTRICALLY CONTROLLED COUNTING MECHANISM

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3 Claims. (Cl. 235—98)

This invention relates to counting mechanisms, and concerns particularly a device of such character involving an electrical contact arranged to be opened and closed under actuation of the articles to be counted as they pass through the device. In its preferred application the invention may be employed to count articles of a flat electrically non-conductive character such as tickets, paper money and the like, and in fact any flat sheet articles. It may also be used to count coins and other articles which are electrically conductive.

We prefer to employ a pair of metallic rolls between which the articles to be counted are passed. If the articles are electrically non-conductive the rolls will normally be arranged to contact each other but permit of separation as the articles pass between. When metallic articles are to be counted the rolls will be disposed in slightly spaced relation and an electrical connection will be provided therebetween each time an article passes through. The rolls will be disposed in an electrical circuit which either directly or indirectly operates a registering mechanism and constitutes a circuit maker and breaker under control of the articles to be counted.

One particular feature of the invention concerns the construction and arrangement of the rolls so as to operate efficiently for articles of varying thickness and at all times provide a good electrical conductor.

A further particular feature of the invention involves a simple arrangement of the various parts of the device such that the articles may be counted rapidly and with a minimum of effort to the operator.

Other features and advantages of the invention will be apparent by reference to the following description and the embodiments illustrated in the accompanying drawings wherein:

Fig. 1 is a longitudinal vertical sectional view of a counting device constructed in accordance with a preferred embodiment of the invention taken on the line 1—1 of Fig. 2;

Fig. 2 is a top plan view;

Fig. 3 is a diagrammatic view of the embodiment of Fig. 1, showing particularly the electrical operating circuit;

Fig. 4 is a diagrammatic view similar to Fig. 3 but showing an article passing between the rolls and breaking the circuit; and

Fig. 5 is a diagrammatic view of a modification of the invention adapted to the counting of electrically conductive articles wherein means are provided for spacing the rolls so that the circuit will be normally open.

A registering counter 10 is employed, and an actuation thereof is directly or indirectly determined by a pair of electrically conductive rolls 11 and 12. Said rolls are disposed in opposing relation so that the articles to be counted may be fed therebetween. One of the rolls is yieldingly mounted with respect to the other so as to permit the passage of an article, and an electrical circuit is provided in which the rolls are interposed to provide a circuit maker or breaker. The circuit, which will be more fully hereafter discussed, will energize and de-energize the registering counter each time an article passes between the rolls.

Preferably, in order to facilitate the use of the device and permit the operator to work with facility and speed, a horizontal platform or table top 13 is provided on which the articles to be counted can be placed. The two rolls 11 and 12 are mounted side by side beneath such platform and directly above the same an opening is cut in the platform. To feed the articles between the rolls a funnel-like member 14 is mounted in the opening, the same being transversely elongated and tapering to a lower end of restricted size so that only one article may be fed to the rolls at one time.

One of the rolls may be journaled on a pair of fixed arms 15 secured to the under side of a platform. In order to allow the rolls to separate upon the passage of articles therebetween the second roll must be yieldingly mounted with regard to the first roll. To this end the roll 12 is journaled on a pair of pivotally mounted arms 16 which may be also secured to the under side of the platform. In the embodiment shown in Fig. 1 the arms 16 have a pivoted point at 17. In order to normally maintain the pivotally supported roll 12 in proximity to the roll 11 a spring 18 is provided connecting with the free end of the arm 16 at one end and secured at its other end to a fixed point which may be on a bracket 19. In order to adjust the tension between the rolls a screw and wing nut connection 20 may be provided in association with one end of the spring. It may be desirable to provide such a spring arrangement at each end of the movably mounted roll 12 so as to definitely preserve the surfaces of the two rolls in alignment. Under such circumstances a second spring device will be provided with the second of the pair of pivoted arms 16, as indicated in Fig. 2.

In alignment with the feed member 14 and

below the rolls is provided a second funnel 21 into which the articles pass after being counted to be conducted to any desired collecting receptacle.

To positively feed the articles from the feed member 14 through the rolls, at least one of the rolls is positively driven. For this purpose an electric motor 22 may be provided secured at some convenient point to the under side of the platform 13. A gear 23 is provided in association with the fixedly supported roll 11 meshing with a gear 24 rotatably mounted on a shaft 25 with a pulley 26. By means of a belt 27 the pulley is driven by the motor and through the gearing just described and the roll 11 is caused to rotate.

The pair of rolls together with the supporting arms and the upper end of the discharge funnel 21 may, if desired, be encased in a metallic or other housing 28.

Since the rolls 11 and 12 constitute a circuit maker and breaker as previously pointed out, it is important that the surfaces thereof should be kept clean at all times and be free from the accumulation of dirt or other foreign matter which may be transferred thereto from the articles as they pass between the rolls. It is therefore proposed to provide in association with the respective rolls 11 and 12 scrapers, or doctor blades, 29 and 30. As shown in Fig. 1, such elements may be mounted upon the roller supporting arms 15 and 16 with their edges in contact with the surface of the rolls. By this means any foreign matter will be continually scraped off the rolls as they rotate.

For the purpose of counting flat sheet articles of electrically non-conductive material such as paper tickets or money, and the like, the embodiment of the invention particularly illustrated in Fig. 1 is employed. In such arrangement the rolls 11 and 12 will be maintained normally in contact with each other through the spring 18 thereby maintaining an electrical connection from one roll to the other. By reason of the positive drive of one of the rolls, as heretofore described, a ticket dropped through the feed funnel 14 is drawn between the rolls to force the same apart and break the electrical connection. The thickness of the articles to be counted may vary without affecting the operation of the device by reason of the fact that the roll 12 is yieldingly supported with respect to the roll 11 on pivotally mounted arms. Therefore, whether the tickets to be counted are of thick or thin material is of no consequence, and both types may be counted without necessitating any adjustment of the device. The electrical connections for the embodiment of Fig. 1 are shown in Fig. 3, in connection with which is to be considered Fig. 4. The power line is shown which transmits current to the driving motor 22, and beyond the motor connections the rollers 15 and 16 are interposed in one side of the power line. When the rolls are in contact the circuit will be completed, and as each successive article to be counted passes between the rolls the circuit will be momentarily broken.

The counter may as shown in Figure 3 be of an electrical type adapted to be energized and de-energized directly from the electrical circuit. Under such circumstances, each time an article passes between the rolls to break the circuit a new number will be rung up on the counter, all as will be evident from a comparison of Figs. 3 and 4. When the article has completely passed through the rolls contact will be re-established preparatory to the reception of an additional article.

In addition to the registering counter 10 it may also be desirable to insert in the electrical circuit at some point beyond the rolls a signal light 31. Such light will serve not only to flash a signal each time an article passes between the rolls, but will further serve to show that the mechanism is working properly. The light can, of course, be mounted at any convenient point. In Fig. 1 it is shown as being set in a recess 32 in the platform 13 and covered by a sheet of colored glass 33, the latter being held in place by a plate 34.

In order to prevent injury to the surface of the rolls by the constant making and breaking of the electrical circuit therebetween a condenser 35 is desirably shunted across the rolls for the purpose or avoiding or minimizing arcing.

It is, of course, important where an electrically energized counter is used that the speed with which the tickets are fed between the rolls be controlled. If a low speed registering counter is employed it is necessary to provide means to control the speed of the motor. It is therefore desirable to provide resistance at suitable places in the line which feeds the motor. In Fig. 3 of the drawings a control rheostat 36 is indicated in one branch of the power circuit which feeds the motor 22.

Where it is desirable to employ the invention for counting electrically conductive articles such as metallic money it is only necessary to make a slight modification in the adjustment of the rolls 11 and 12. Whereas in the case of non-conducting articles the rolls are disposed normally in contact so as to separate the rolls and break the electric circuit as an article passes through, for present purposes the rolls are disposed in slightly spaced relation so that as a metallic article passes therebetween the electrical circuit will be completed through the medium of the article. To maintain the rolls in slightly spaced relation, an adjustable stop may be provided as shown in Fig. 5 adapted to bear against the pivotally supported arm 16 which carries the roll 12. The stop will have a fixed support such as an arm 37 and comprise an adjustable screw 38. Such stops may be provided in association with one or both of the pair of pivoted arms 16. If the metallic articles to be counted are relatively thin the adjustment of the stops should be such as to space the roll 12 only a slight distance from roll 11. At all events the adjustment of the stops will depend primarily upon the thickness of the articles to be counted, it being obvious of course, that the space between the rolls should be slightly less under any circumstances than the thickness of the article so that the article will be pressed against the surface of both rolls and insure a proper electrical connection. For the present purpose, if an electrical counter is employed it should be of a type which will register each time the circuit is closed.

It will be evident that we have provided an effective counting mechanism of very simple construction which may be used for counting a variety of articles of flat form. Only a minimum of working parts are employed, and the arrangement thereof is such that there is little likelihood of the device getting out of order. It is believed also that the arrangement of the controlling mechanism in association with the horizontal platform makes the device suitable for the rapid

counting of articles with but slight exertion on the part of the operator.

It will be obvious to those skilled in the art that the invention is capable of some modification and equivalency, so that we do not intend to be limited in the practice thereof beyond the scope of the appended claims.

What we claim is:

1. In a machine for counting flat articles, a counter, an electrical circuit controlling said counter, an article receiving platform, a pair of electrically conductive rolls mounted side by side in opposing relation beneath the platform, said rolls being interposed in the electrical circuit and yieldingly mounted with respect to each other to permit the passage of articles therebetween, a funnel-shaped conduit projecting through the platform in vertical alignment with said rolls having a restricted orifice and adapted to feed articles by gravity one by one to the rolls, and driving means connecting with one of the rolls to draw the articles between the rolls to alternately open and close the electrical circuit.

2. In a machine for counting flat articles, a counter, a pair of horizontally disposed rolls lying in opposing relation, a pair of pivotally mounted arms supporting one of said rolls in yielding relation to the other roll so as to permit the passage of articles therebetween, tensioning means connected to at least one of the pivoted arms to yieldingly resist separation of the rolls, and means comprising a funnel shaped article feeder having a restricted outlet disposed above the rolls and lying in the plane of the rolls and adapted to feed articles singly and successively between the rolls, and means for actuating the counter upon the passage of articles between the rolls.

3. In a machine for counting flat articles, a counter, a pair of horizontally exposed rolls lying side by side in opposing relation, a funnel shaped article feeder disposed above said rolls and lying in the plane of the rolls, said feeder having a restricted orifice adapted to feed articles singly and successively between the rolls, said rolls being yieldingly mounted with respect to each other so as to permit the passage of articles between the rolls, and means for actuating the counter upon the passage of articles between the rolls.

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