E. G. STAUDE.

COUNTER FOR BOX BLANKS.

APPLICATION FILED OCT. 11, 1909.

1,113,503.

Patented Oct. 13, 1914.

2 SHEETS—SHEET 1.

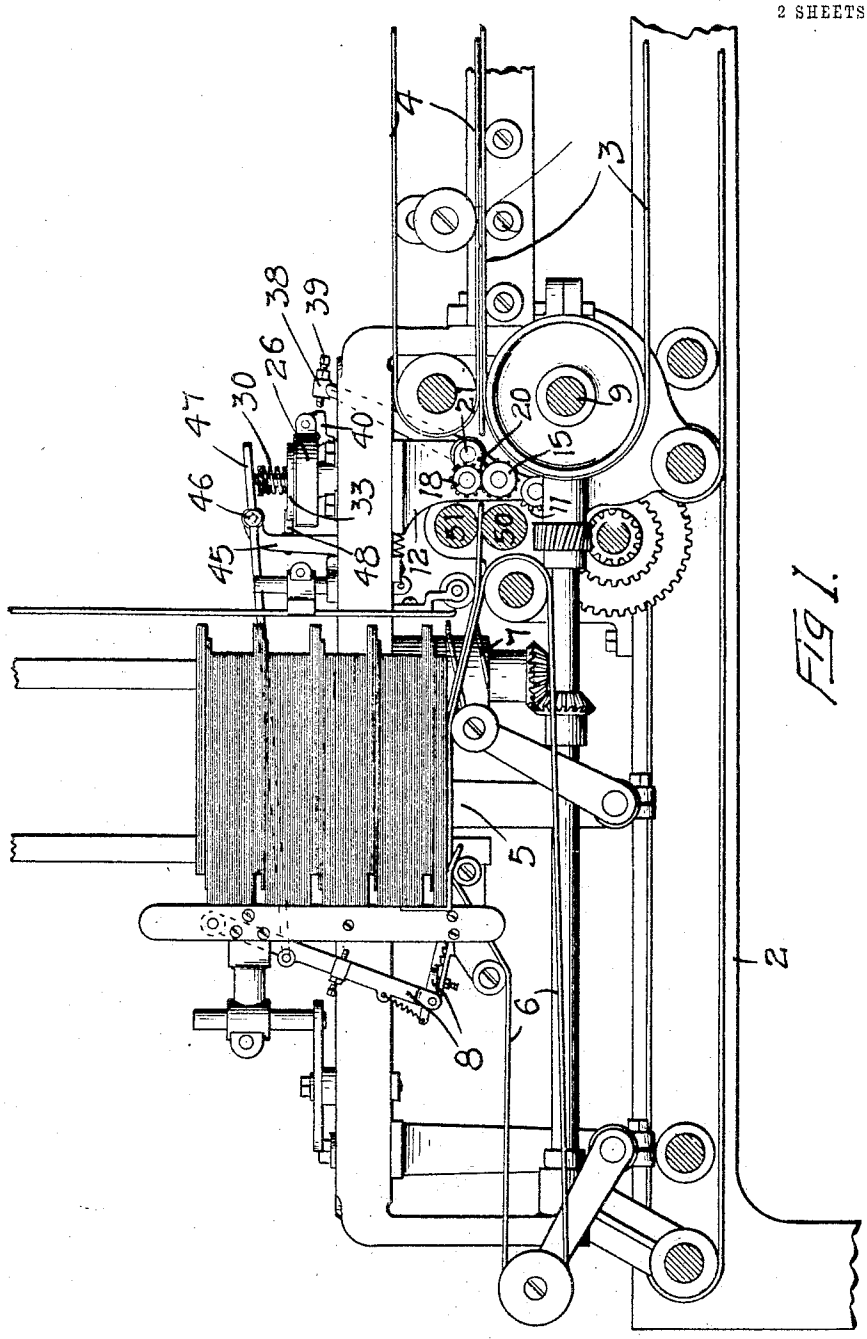


FIG 1.

WITNESSES

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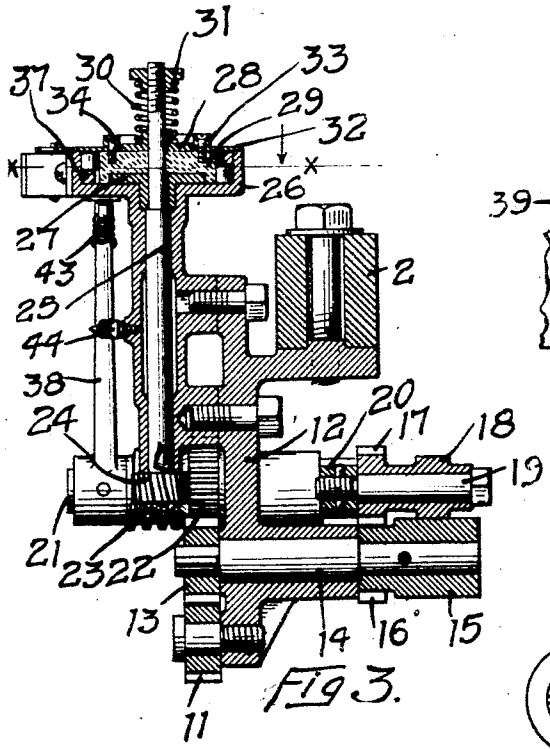


Fig 3.

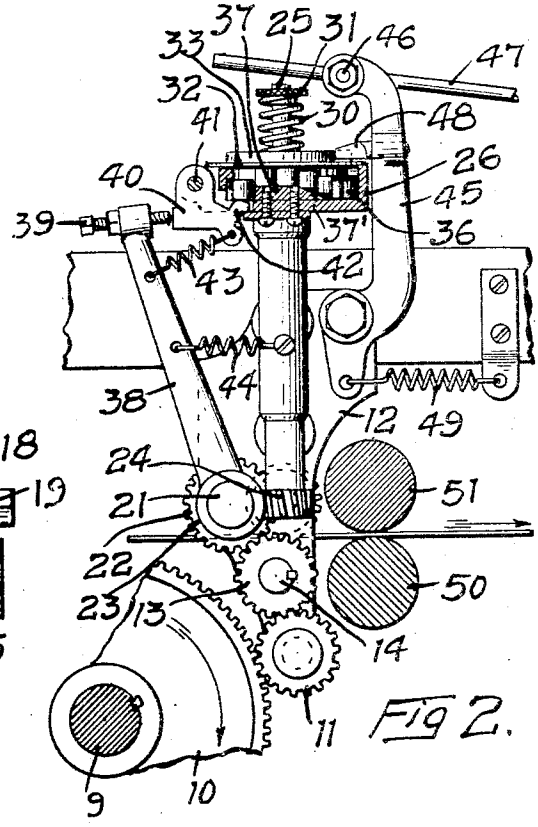


Fig 2.

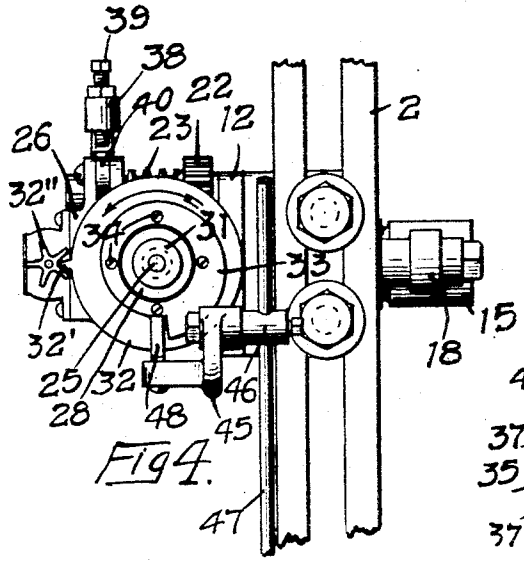


Fig 4.

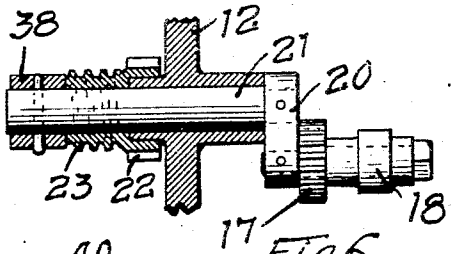


Fig 6.

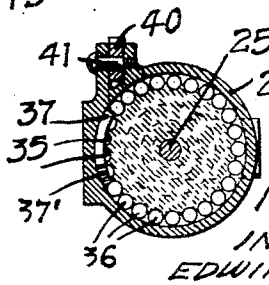


Fig 5. X–X

WITNESSES

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UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF MINNEAPOLIS, MINNESOTA.

COUNTER FOR BOX-BLANKS.

1,113,503. Specification of Letters Patent. Patented Oct. 13, 1914.

Application filed October 11, 1909. Serial No. 522,198.

To all whom it may concern:

Be it known that I, EDWIN G. STAUDE, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Counters for Box-Blanks, of which the following is a specification.

The object of my invention is to provide means for quickly and accurately counting box board or other blanks.

A further object is to provide a mechanism which can be operated accurately at a high speed and will be so extremely sensitive as to register blanks of less than one one-hundredth of an inch in thickness.

A further object is to provide a construction which, though capable of operation at a very high speed, will be extremely durable and will show a minimum of wear in proportion to the period of operation.

A further particular object of my invention is to provide a counting device that is not liable to get out of adjustment.

I have found in actual practice that counting mechanisms as ordinarily constructed are generally inaccurate, counting either too fast or too slow. The first defect is caused by the rapid movement of the actuating pawl on the ratchet, which often permits two articles to be registered when only one should be. This is due to the uneven tension of the brake usually employed to prevent over registration and caused by the variable adhesive qualities of the metals at different temperatures. The under counting is frequently caused by the brake being set a trifle too tight and preventing the pawl from getting on the ratchet the proper distance to permit accurate registration. Owing to high speed and the very limited movement of the actuating arm, it is practically impossible to construct a ratchet sufficiently large to have the necessary bearing surfaces at the wearing points, for the reason that in so doing the disk is so large and heavy that in overcoming its inertia the strain on the short arm of the bell crank will be so great that the stock will be crushed between the operating rolls and be damaged and rendered unfit for commercial purposes. In the construction which I employ, the only function of the operating bell crank is to raise a single roller block out of engagement with the stop provided on the inner circle of the pawl case. The construction and arrangement of my bell crank is such that blanks of different thicknesses can be accurately counted without readjusting the mechanism. I attain this end by utilizing the return stroke of the bell crank for actuating the small trigger, which in turn raises the block. In actual practice I have found that a mechanism of this kind will have more than ten times the life of an ordinary counting mechanism on a high speed machine, and at the same time exert so small a degree of pressure on the blank that it will not in any way damage or disfigure the finest lithographed stock.

My invention consists generally in a counting device including a series of blocks and a driven disk, a stop and means for moving the blocks to clear said stop.

Further the invention consists in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming a part of this specification, Figure 1 is a vertical sectional view through a box blank making machine with my improved counting mechanism applied thereto, Fig. 2 is a side elevation, partially in section, illustrating the counting mechanism, Fig. 3 is a sectional view illustrating the friction device and the means for operating the same, Fig. 4 is a top view of the counting mechanism, Fig. 5 is a sectional view on the line x—x of Fig. 3. Fig. 6 is a detail sectional view showing the shaft and crank from which the trigger operating arm is actuated.

In the drawing, 2 represents the frame of the machine and 3 and 4 feed belts between which the blanks are fed to the counting mechanism.

5 is a hopper having a feed belt 6, a spiral spring 7 by means of which the blanks are elevated into the hopper from the bottom. This feeding mechanism forms the subject matter of a pending application filed Dec. 17, 1906, Serial No. 348,166, and the mechanism for indenting the blanks, which I indicate by reference numeral 8, also forms the subject matter of a pending application No. 461,478, filed Nov. 7, 1908, and does not require detailed description or illustration herein. The counting mechanism which I prefer to employ in this machine is illustrated in detail on Sheet 2 herewith, and has been found to be extremely accurate at high speed and readily adapted for blanks of various sizes and thicknesses of stock, thus making it of universal application.

A transverse shaft 9 of the machine has a gear 10 thereon meshing with a pinion 11 that is carried by a bracket or hanger 12. The pinion 11 meshes with a similar pinion 13, keyed on a shaft 14 that is journaled in the bracket 12 and has a roller 15 secured thereon and provided at one end with a series of teeth 16, meshing with teeth 17 of a narrow faced roller 18 that is carried by a shaft 19 on a crank 20, which, in turn, is secured to a rock shaft 21 journaled in the bracket 12. An idle gear 22 is mounted on the shaft 21 and meshes with the pinion 13 and is driven thereby and the hub of said idle gear has a worm 23 thereon which meshes with a gear 24 secured to the lower end of an upright shaft 25, also having bearings in the bracket 12. The upper end of this shaft projects through a casing 26. A disk 27 is provided within said casing and secured to the shaft 25 and is preferably immovable thereon. A second disk 28 is splined on the shaft 25 and separated from the disk 27 by a friction disk 29. The disk 28 is held in yielding contact with the disk 29 by means of a spring 30 and an adjusting nut 31. The plate 32 carries a cam 33 and is secured to the friction disk 29 by screws 34 or other suitable means. The periphery of the friction disk has a series of transverse vertically arranged grooves 35 therein to receive blocks 36, which are preferably cylindrical in form and are ranged entirely around the periphery of the disk. A stationary stop 37 is provided within the casing 26 in the path of the blocks 36. An arm 38 is secured on the shaft 21 and provided with an adjustable contact screw 39 which engages a trigger 40 pivoted at 41 on the casing 26 and having a lug 42 projecting into said casing in the path of the blocks 36. A spring 43 connects the arm 38 with the trigger 40 and a similar spring 44 normally holds the screw 39 on the said arm, in the path of the trigger. The throw of the trigger may be regulated by the adjustment of the screw 39. A lever 45 is pivoted on the bracket 12 and has an adjustable connection at 46 with one end of a rod 47, the opposite end of which is connected to the indenting mechanism 8, fully described in my application above referred to. The lever 45 carries an arm 48 projecting over the cover plates 32 into the path of the moving cam 33 and a spring 49 normally holds the said arm in engagement with the surface of said cam. Feed rollers 50 and 51 are provided near the rollers 15 and 18, between which the box blanks pass to the hopper feeding belt. The lug 42 in the normal position of the trigger 40 will be in the path of the friction disk blocks and will stop movement of the same and temporarily arrest operation of the counting mechanism, although the shaft 25 and its driving connections may be in operation. As soon as a blank enters between the rollers 15 and 18, the roller 18 will be lifted, oscillating the crank 20 and rocking the shaft 21 to throw the arm 38. This movement of the arm will draw the trigger down to the position indicated in Fig. 2 out of the path of the rollers and permit the frictional engagement of the disk 28 with the disk 29 to start the latter and rotate it until the block contacts with the stop 37. At this time the block will be above the lug 42 and on the return stroke of the arm 38 the trigger will rise and lift the block out of engagement with the stop and permit it by a partial movement of the disk 29 to pass over the stop and the rotation of the friction disk to be continued, to be arrested again when the next block contacts with the lug 42. The lug 42 is smaller in diameter than the block to permit this step by step movement of the disk. If, however, a second blank immediately follows the first one, the lug will be withdrawn again from the path of the block and permit continuous rotation of the friction disk. I have provided twenty-five of the blocks 36 so that a complete revolution of the friction disk will be obtained upon the passage of twenty-five blanks through the rollers, and when the revolution is complete the arm 48, bearing on the edge of the cam 33, will drop off the shoulder thereof allowing the lever 45 to oscillate and move the rod 47 to actuate the mechanism 8 and cause the pile of blanks to be indented in the manner described in my application above referred to. The number of blocks may, of course, be varied according to the desired distances between the indentations of the stack of blanks and the number the operator wishes to arrange in each pile. For convenience of handling, however, I have found the number twenty-five well adapted for machines of this type.

The continuous operation of the rollers 15 and 18 has no effect, it will be understood, on the counting mechanism, because of the idle pinion 22 and the counter will remain inactive until the crank arm 20 is oscillated by the entrance of a blank between the rollers. I have shown small cylindrical blocks in connection with the friction disk and counting mechanism, but the shape of these may be varied and in some instances balls might be used. I prefer, however, the form of blocks shown, as I am able to attain a more accurate counting by such a construction.

The driving mechanism herein shown is susceptible of various changes and modifications, all of which will be within the scope of my present invention, the mechanism shown being preferable on account of its simplicity and durability.

The stop 37 has an inclined surface 37′ at

one end, over which the blocks will easily ride to their normal level. The cover 32 has a projection 32′ thereon to engage a star wheel 32″ and operate a suitable registering device.

I claim as my invention.

1. In a counting mechanism comprising rotatable members one of which has continuous movement and the other intermittent movement, stop-mechanism for holding the intermittently movable member, a pair of continuously revoluble rolls arranged for the passage of a box-blank between them, and mechanism connecting one of said rolls with said stop-mechanism to actuate the latter to release the intermittently movable member, substantially as described.

2. In a counting mechanism comprising rotatable members one of which has continuous movement and the other intermittent movement, stop-mechanism including an oscillating lever for holding the intermittently moving member, a pair of continuously revoluble rolls arranged for the passage of a box-blank between them, and means operatively associated with said rolls for oscillating said lever to release the intermittently moving member on a blank passing between said rolls, substantially as described.

3. In a counting mechanism comprising rotatable members one of which has continuous movement and the other intermittent movement, stop-mechanism for holding the intermittently moving member, a pair of continuously revoluble rolls arranged for the passage of a box-blank between them, mechanism connecting one of said rolls with said stop-mechanism to actuate the latter to release the intermittently movable member, a lever connected with a device to off-set certain blanks in a stack of blanks, and means connecting said lever with one of the movable members to actuate the lever upon the completion of a pre-determined number of stops made by the intermittent moving member, substantially as described.

4. In a counting mechanism comprising rotatable members one of which has continuous movement and the other intermittent movement, stop-mechanism for holding one of said members from continuous movement, parallel shafts each carrying a revoluble roll, one of said shafts being a crank-shaft and connected with the stop-mechanism, a pinion and worm mounted on said shaft, and an upright shaft connected with said rotatable members and provided with a worm-gear meshing with the worm of the crank-shaft, substantially as described.

5. In a counting mechanism comprising rotatable members, stop-mechanism for holding one of said members from continuous movement, parallel shafts each carrying a revoluble roll, one of which is smaller in diameter than the other, one of said shafts being a crank-shaft, a pinion and worm mounted on said shaft, an upright shaft connected with said rotatable members and provided with a worm-gear meshing with the worm of the crank-shaft, and a lever connecting the crank-shaft, and co-acting with parts of the stop-mechanism to release the member held from continuous movement, substantially as described.

6. In a counting mechanism a revolving disk, peripheral locking means therefor, a trigger arranged to engage and trip said locking means successively as said disk revolves, rolls between which a box blank is fed and means operatively connected with said rolls and actuated by the separation of said rolls during the passage of a blank for moving said trigger to release said disk.

7. In a counting mechanism, a friction driven disk, peripheral locking means therefor, a trigger arranged to trip said locking means, a rock shaft, an arm thereon for actuating said trigger, a crank secured to said rock shaft, and rolls between which a box blank is fed, one of said rolls being carried by said crank, whereby the separation of said rolls during the passage of a blank will be multiplied to operate said arm and trigger.

In witness whereof, I have hereunto set my hand this 8th day of October 1909.

EDWIN G. STAUDE.

Witnesses:

RICHARD PAUL,

J. A. BYINGTON.