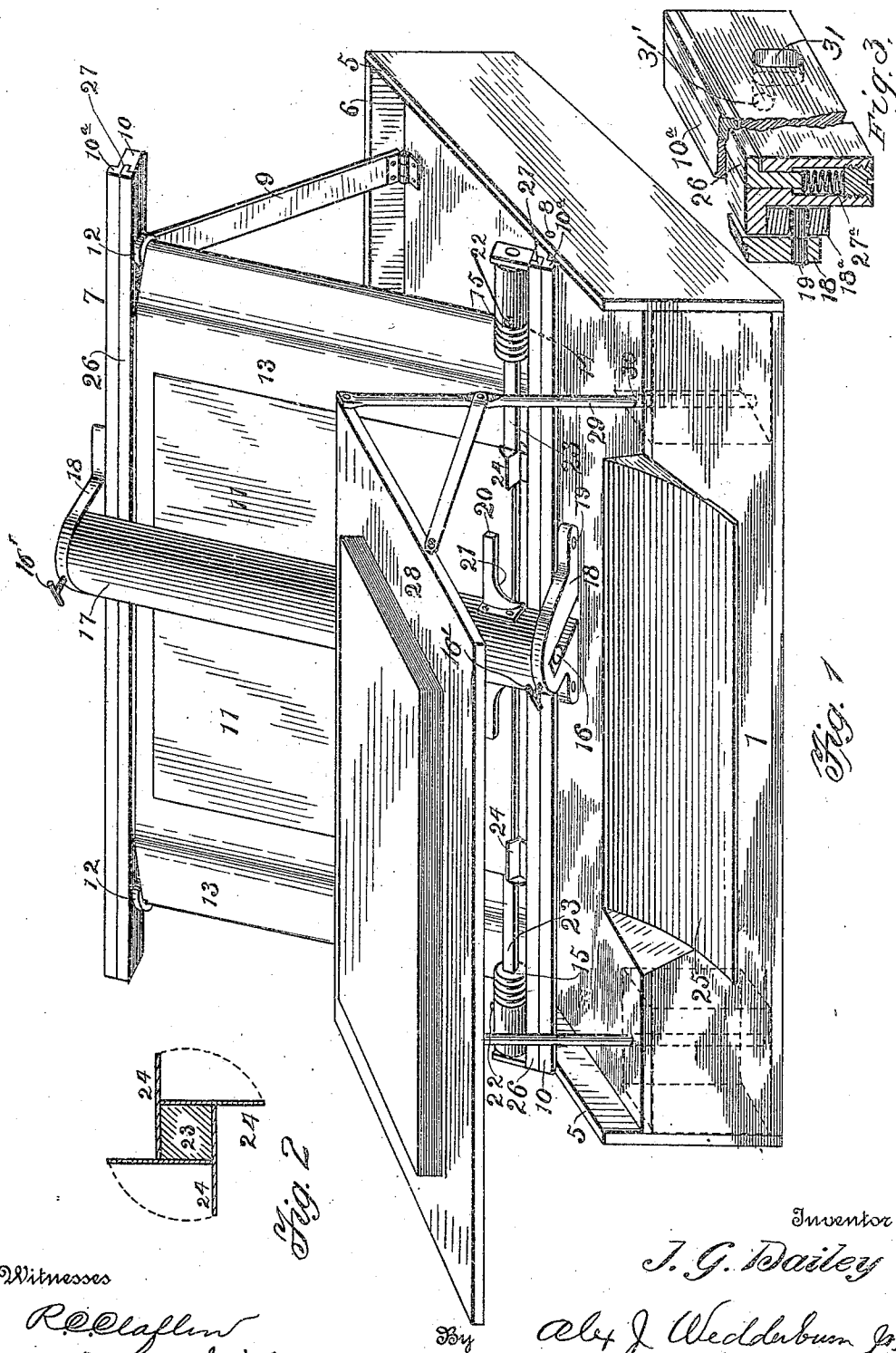


958,098.

J. G. DAILEY.
 DUPLICATING MACHINE.
 APPLICATION FILED JUNE 25, 1909.

Patented May 17, 1910.

3 SHEETS—SHEET 1.



Witnesses

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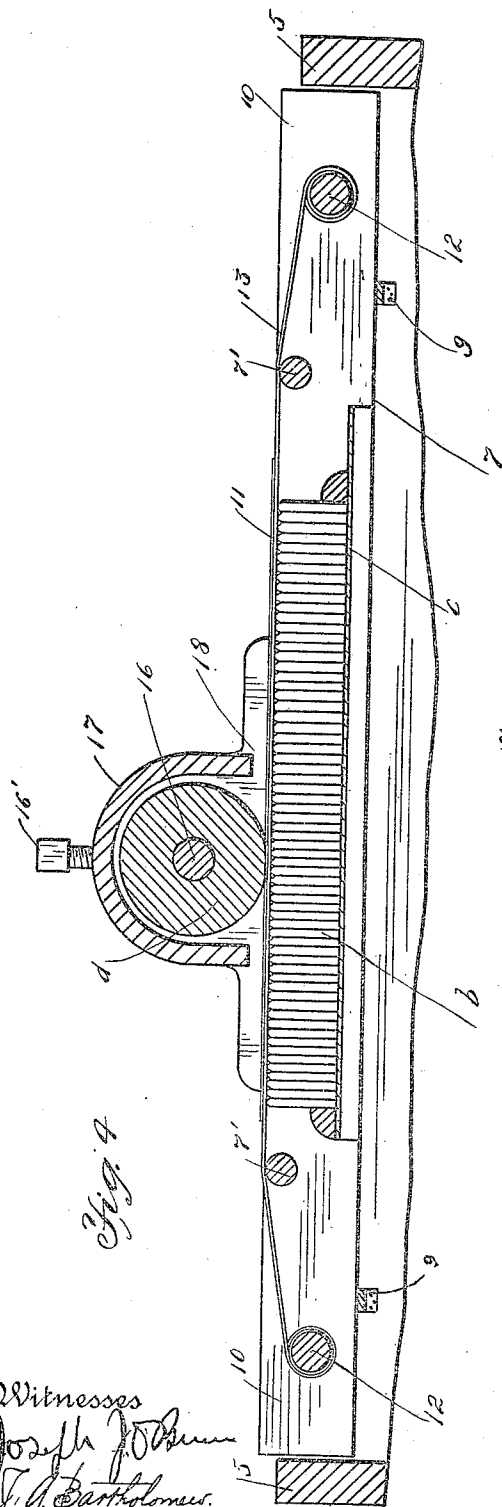


Fig. 4

Witnesses
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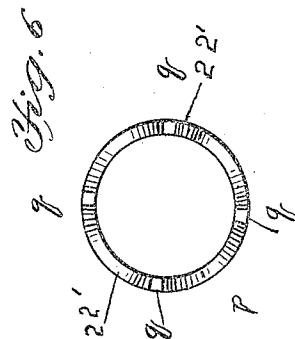


Fig. 6

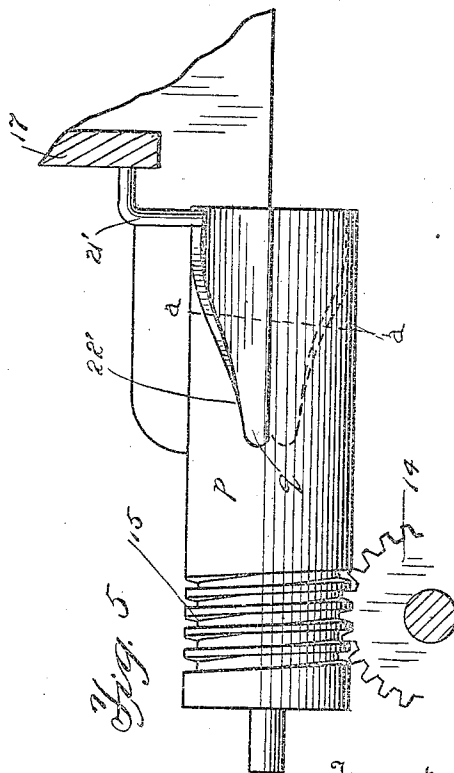


Fig. 5

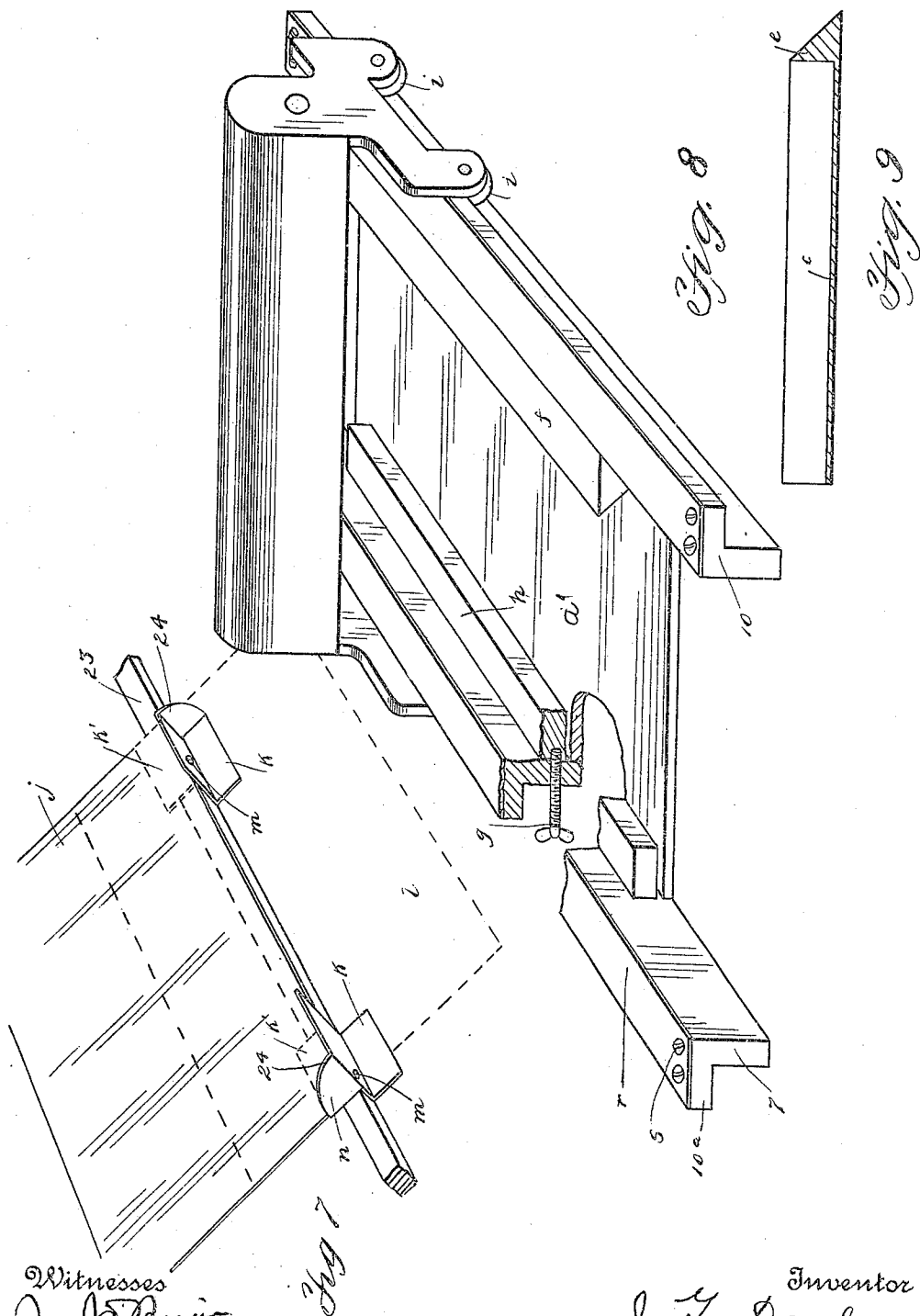
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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DUPLICATING-MACHINE.

958,098.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed June 25, 1909. Serial No. 504,364.

To all whom it may concern:

Be it known that I, JAMES GERALD DAILEY, citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Duplicating-Machines, of which the following is a specification.

My invention relates to improvements in duplicators such as are used for making manifold printed copies from type, inked by means of a cloth or ribbon which dispenses the ink.

The objects of my invention are, 1—to provide a duplicator by which any number of prints may be obtained. 2—to provide a duplicator by which the best quality of printing may be obtained. 3—to provide a duplicator which automatically disposes of the printed sheets, piling them in correct relation to each other. 4—to provide a duplicator in which there is no lost motion as every trip of the carriage in either direction produces a printed copy. I attain these objects by the mechanism illustrated in the accompanying drawings, in which,

Figure 1 is a perspective view of my improved duplicator, Fig. 2 is a sectional view of the tumbling rod and rests, Fig. 3 is a perspective of a duplex bearing for the ribbon spools. Fig. 4 is a longitudinal sectional view of duplicator. Fig. 5 shows a detail view of the ribbon mechanism, also a modified form of the means for operating the tumbling rod. Fig. 6 is a sectional view of Fig. 5 taken on line *a-a*. Fig. 7 is a detail view of the tumbling rod showing the paper rests in two positions, one in dotted lines. Fig. 8 shows a bed plate in connection with a modified form of track beams, with a roller mounted thereon. Fig. 9 shows a sectional view of a galley.

Suitable characters designate similar parts throughout the drawings, in which,

1 is the basal member, comprising a cabinet having drawers in the rear, the top drawer being for the purpose of containing printer's furniture, tools, etc., and the two lower drawers or type cases for type.

The sides 5 and the back 6 of the cabinet, extend upward forming a ledge, bounding three sides of the top surface of the cabinet.

A printing frame 7 is pivoted to the ledges 5 at 8 and connected to the ledge 6 by the braces 9 which are hinged to and

adapted for folding under the frame, which is adapted to be let down into the recess which is bounded by the ledges 5 and 6 for convenience in packing and carrying.

The frame 7 comprises the track beams 10, rigidly spaced apart by rods 7' and united with a bed plate *d'* which is located centrally in the frame, under the paper 11. Journaled near each end of the frame are spools 12, on which an inked ribbon 13 is disposed, extending over the bed plate and resting upon the face of the type *b* in a galley *c* placed thereon. The spools 12 are provided with a worm or other gear 14, which engage worms or cogs 15, for rotating the spools 12, thereby winding the ribbon from one spool to the other and shifting its position with relation to the type on the bed plate.

The galley *c* is provided on one side with an angular extension *e* which is adapted to engage with a corresponding angular incline *f* on one side of the bed plate. The upper track beam 10 is provided with set screws *g* which engage a stick *h* for locking type in the galley *c*.

The spools 12 are designed for optional engagement and disengagement of the worm or other gears by means of the duplex bearings 31, as shown in detail at Fig. 3, comprising an oblong hole 31 extending in the direction of the spool's axis, the breadth of the hole being equal to the diameter of the journal of the spool, and the length of the hole approximately double the breadth.

The ends of the hole at 31' are made deeper than at the other end and adapted to snugly receive the spool journals which when contained therein hold the gears 14 in engagement with the worms 15, but when released therefrom by placing the journal in the shallower end of the oblong hole, the teeth of the worm are disengaged. By engaging the gears at one end and disengaging them at the other, it is obvious that the spools may be caused to rotate to right or to left at will of the operator, the threads of one pair of gears being rights and the other pair lefts.

The paper 11, which is to receive the print is placed upon the ribbon over the type upon the bed plate and held in place as herein-after described.

A rubber covered pressure roller or platen *d* journaled at 16' is placed under a casing

17, which together with the plates 18 and the guide rollers *i* on roller bearings being journaled on the ends 19, constitute a carriage for the impression roller. The impression of the pressure roller is regulated by set screws 16'. The wear of the rollers is taken up by these set screws. The carriage is adapted to traverse the printing frame by means of direct hand or foot power and to travel along the track beams 10, having flanges 10^a under which the rollers on the studs 19 are engaged for holding the impression roller in contact with the paper and for guiding the carriage when caused to move along the track rails.

One side of the printing frame is pivoted to the case, the other side when being operated is raised to a suitable angle and supported by props as shown in the drawings. This position of the printing frame causes the paper to slide therefrom at each $\frac{1}{4}$ turn of the tumbling rod, the action of the one-fourth turn of the tumbling rod on the paper is illustrated in Fig. 7, the sheet of paper in full lines *j* is shown on the paper rests in dotted lines *k'*. After a one-fourth turn of the tumbling rod the paper rests $\frac{1}{2}$ have released the paper, which is shown in dotted lines passing therefrom as at 1.

24 are combined paper rests and paper guides and may be readily adjusted on the tumbling rod by means of the set screws *m*. The side pieces *n* on these rests form the sidewise guides for the paper. This angular position of the printing frame with feed table 28 exactly in front also makes the feeding of the paper with each hand much easier and quicker.

The feed table 28 is supported in front of the printing frame by means of an arm 29, which is located in a socket 30 on the cabinet 1.

Rigidly secured to each side of the casing 17, is an arm 20, having a curved edge 21, adapted for engagement with the studs 22, for rotating the tumbling rod 23, which carries the worm 15 and also carries paper rests or guides 24, of which there are two, one at each lower corner of the paper, movably disposed upon the tumbling rod 23, and adapted for adjustment according to the length of the paper being printed, thereby securing perfect registration.

Each sheet of paper is held by two opposing paper rests or guides while the roller is crossing and the paper being printed, and when the arms 20, engage the studs 22, the tumbling rod is rotated sufficiently to allow the rests to assume a position parallel with the paper. The paper is caused to slide from the bed plate into the chute 25 and thence to a position in front of the duplicator. Instant with the releasing of a sheet of paper, another pair of paper rests or guides are thrown into position to support

another sheet, each sheet being released automatically after being printed as above explained.

I do not limit my invention to the exact mechanism here shown for rotating the tumbling rod, but I here describe a modification for performing the same function, viz.—A cylindrical body *p* Fig. 5 rigidly secured to the tumbling rod near its end and having a multiplicity of notches *q* in its perimeter nearest the carriage, each notch having a curved side 22' for engagement with a stud 21' on the carriage, which stud by sliding engagement with the curved side of the notch causes a partial rotation of the tumbling rod.

It is important that the impression roller be rotating when it comes in contact with the paper and when it breaks contact therewith, and provision for this feature is made by the use of a pair of contact bars, movably seated in the slots 27 in the track rails and provided with springs, 27^a, seated in cavities to hold the bars in contact with the impression roller, and by friction thereon when the roller is being moved cause the roller to rotate. Another method of producing friction for the purpose of rotating this impression roller before it comes in contact with the type is to secure a strip of soft rubber or like material *r* along the upper surface of the track rails and secured thereto by screws *s* or otherwise as shown in Fig. 8.

I claim and desire to secure by Letters Patent:—

1. A duplicator consisting of a cabinet, a printing frame angularly disposed on said cabinet, an impression roller operating on said printing frame, paper rests for holding paper on said angular printing frame, means for rotating said paper rests, and thereby automatically releasing paper from said frame as shown and specified.

2. A duplicator consisting of a printing frame placed in an angular position, rotating means for holding paper thereon and for releasing said paper, in combination with a chute for directing the course of said paper after leaving said frame for the purpose shown and described.

3. The combination in a duplicator, of a printing frame comprising the track beams and the bed plate, a carriage mounted thereon, a roller mounted on said carriage, grooves in said track beams containing contact bars held in contact with the roller by means of springs under the contact bars, a tumbling rod parallel with one of said track beams, spools journaled in the track beams and carrying an inked ribbon, said spools having a geared connection with said tumbling rod, means for automatically rotating the tumbling rod by engagement with said carriage which is fitted with guide rollers engaging flanges on the track beams, paper rests mov-

ably seated upon the tumbling rod, means for engaging and disengaging the gears on the spools and tumbling rod, all substantially as shown and described.

5 4. The combination in a duplicator, of a printing frame pivotally mounted upon a cabinet, track beams having grooves therein mounted on either side of said printing frame, contact members adapted to fit said
10 grooves, a traveling roller carried by a carriage and adapted to contact with said contact members, ribbon spools positioned at the ends of the printing frame, gears on said spools, a tumbling rod positioned longitudinally with respect to one of said track beams, said tumbling rod geared to said spools, and means carried by said carriage for automatically operating said tumbling rod.

20 5. The combination in a duplicating machine having a printing frame mounted upon a cabinet, of track beams with grooves therein on said frame, contact bars mounted in the grooves in said track beams, springs
25 positioned under said contact bars, a carriage mounted on said frame, a traveling roller carried by said carriage and adapted to contact said contact bars, spools positioned at the ends of said printing frame,
30 journals for said spools in the ends of said track beams, a tumbling rod having gears for engagement with said spools mounted on said printing frame and means carried by said carriage for automatically rotating said
35 rod.

6. A duplicator consisting of a cabinet, a printing frame angularly disposed on said cabinet, an impression roller operating on said frame, means for regulating the pressure of said impression roller and friction
40 means for rotating said roller, a tumbling rod with gears thereon mounted on said frame, ribbon spools located at the ends of said printing frame, gears on said ribbon spools, duplex bearings for said ribbon spools located in the lower side of said printing frame, said duplex bearings adapted to hold the gears on said spools in or out

of engagement with the gears on said tumbling rod, paper rests for holding paper on
50 said angular printing frame, means for automatically releasing paper from said frame, a chute for guiding paper after being released from said printing frame and means for locking type within said printing frame. 55

7. The combination in a duplicator of a printing frame including a bed plate having track beams thereon, flanges on said track beams, a carriage mounted on said track beams, a roller mounted on said carriage, 60 guide rollers mounted on said carriage, said guide rollers engaging said flanges, grooves in said track beams, contact bars mounted in said grooves, springs under said contact bars, a tumbling rod mounted parallel with one
65 of said track beams, gears on said tumbling rod, spools journaled in said track beams and carrying an inked ribbon, gears on said spools, said spools having a geared connection with said tumbling rod, arms secured
70 to said carriage through the medium of which said tumbling rod is automatically rotated, paper rests seated upon said tumbling rod, means for engaging and disengaging said gears on said spools, said printing
75 frame pivotally mounted on a cabinet, a paper guide on said cabinet and means on said cabinet for holding said printing frame in an angular position when in operation.

8. A duplicator consisting of a cabinet, a
80 printing frame angularly disposed thereon, a bed plate forming a part of said frame, an angle bar on the lower end of said bed plate, a locking stick movably secured to said frame and an impression roller mounted
85 thereon, a tumbling rod secured to said frame, paper rests and guides slidably disposed on said tumbling rod and means for operating said tumbling rod for the purpose shown and described. 90

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

JAMES GERALD DAILEY.

Witnesses:

FREDERICK BECHT,

THOMAS P. MCGARVEY.