G. WOOD.

DUPLICATOR.

APPLICATION FILED MAR. 4, 1910.

998,663.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1

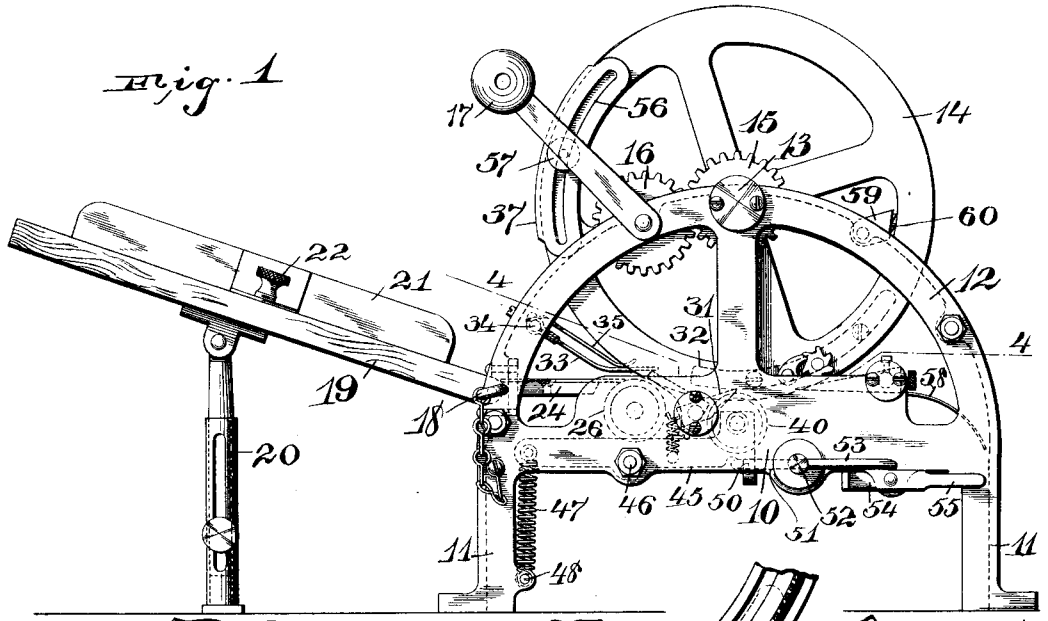


Fig. 2

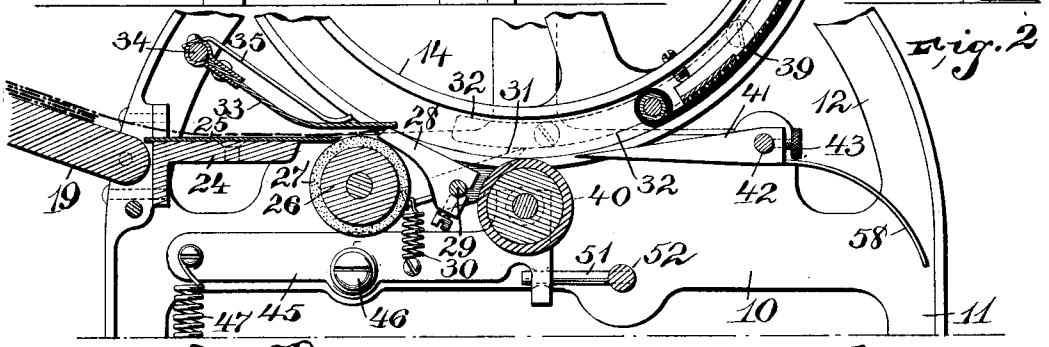
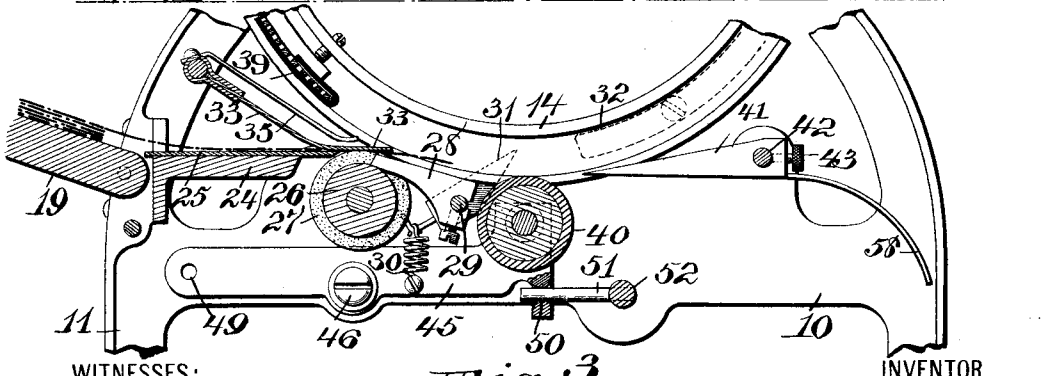


Fig. 3



WITNESSES:

E. A. Pile

M. A. Johnson.

INVENTOR

George Wood,

BY

Mun & Campbell.

ATTORNEYS

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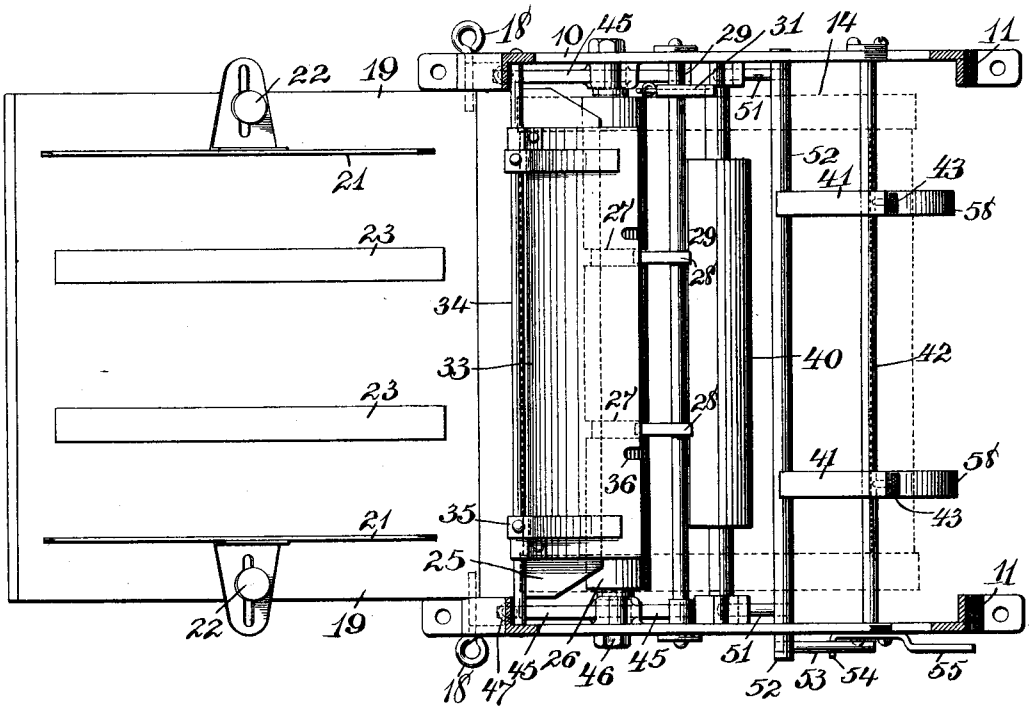

Fig. 4

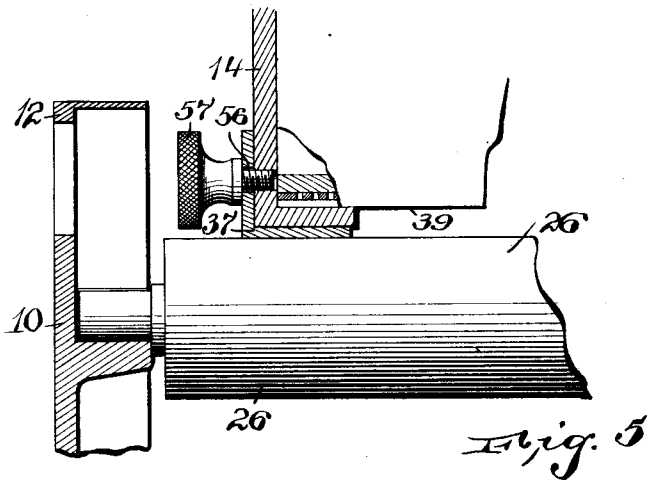

Fig. 5

WITNESSES:

E. A. Peel

M. A. Johnson

INVENTOR

George Wood,

BY

Wm. H. Campfield

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE WOOD, OF NEWARK, NEW JERSEY.

DUPLICATOR.

998,663. Specification of Letters Patent. Patented July 25, 1911.

Application filed March 4, 1910. Serial No. 547,178.

To all whom it may concern:

Be it known that I, GEORGE WOOD, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Duplicators; and I do hereby 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 figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved duplicating apparatus, and is designed to provide a stop for the paper that is fed sheet by sheet into the duplicator, the stop being operative while the duplicating sheet is inoperative, that is, at a point in the rotation where the duplicating roll is not in position to engage the impression roller. The feeding means is designed to provide a mechanism whereby the stop for the paper releases the sheet to be fed, and immediately after this release, feeds the paper through between the impression roller and the duplicating roll, the stop forming no obstruction to the passage of the paper, except when the duplicating roll is inoperative.

A further object of the invention is to provide means for adjusting the feeding of the paper, after it is released from the stops, so that the paper can be fed to bring the impression from the duplicating roll near the top edge of the paper, or it can be so adjusted that the printing will commence at a considerable distance down the sheet from the top.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the duplicator. Fig. 2 is an enlarged sectional view showing the stops in position to retard the sheet being fed. Fig. 3 is a view similar to Fig. 2, showing the stops out of the way of the paper, and illustrating the paper being fed. Fig. 4 is a section on line 4, 4, in Fig. 1 with the duplicating roll removed, and Fig. 5 is a section showing the feed roll and a portion of the duplicating roll and the adjustable means that causes the duplicating roll to operate the feed roll at a desired point in the rotation of the duplicating roll.

The device comprises a standard or support formed with the side plates 10 which are provided with the legs 11 and with the arched portion 12, the arched portion having bearings 13 between which is mounted the duplicating roll 14, the duplicating roll having, on its shaft, a gear-wheel 15 which is in mesh with the driving gear 16 operated by the handle 17, this mechanism being usual in duplicating apparatus, the gears being provided to give the proper rotation to the duplicating roll and still permit the handle to be turned to the right. In the side frames 10, and at one end thereof, are arranged pins 18 which are provided to detachably secure the end of a feeding table 19 which is provided with an adjustable leg 20 and with the gages 21 which are held by the set-screws 22 and are arranged to regulate the feeding of the paper, the whole pile of papers being prevented from slipping down the inclined table 19 by rubber strips 23 which are secured to the table 19.

To receive the top sheet of paper is arranged a shelf 24, which shelf extends from side to side between the side frames 10 and can have its top face finished, or can be provided with a smooth, polished plate 25 which projects with its edge substantially tangential with the periphery of the feed roll 26. The feed roll 26 is provided with grooves 27, shown more particularly in Figs. 2, 3 and 4, and within these grooves are adapted to normally rest the stop fingers 28 which rock on the shaft 29 and which normally lie in the grooves 27, being pulled down by the spring 30 fastened to the end of a latch 31, which latch is operated by a plate 32 fastened to one side of the duplicating roll and so secured that the engagement of the latch 31 takes place after the duplicating sheet on the duplicating roll has passed the feed roll 26. When the latch is engaged by the plate, the fingers 28 are forced up against the under side of a gage 33 which is arranged to swing on a rod 34 extending between the side plates 10, the gage being normally pressed down by springs 35 which are secured to the rod 34. It will thus be seen that when the latch is pressed down and the fingers 28 are pressed up against the gage, a stop between the gage and the fingers is formed so that the top sheet can ride up and rest over the top edge of the feed roll 26, the operator being able to see, through the cut-away portions 36 in the gage 33, that the paper is in place, this being possible because the op-

erator can see through the gap between the ends of the duplicating sheet when the next sheet is to be fed. At this point of the rotation of the duplicating roll the feed roll 26 is not rotated, since the periphery of the duplicating roll does not engage the periphery of the feed roll, but when the feed plate 37 mounted on the duplicating roll 14 comes around in its rotation it frictionally engages the feed roll 26, since it projects beyond the periphery of the duplicating roll as shown in Fig. 5, and the fingers 28 having previously dropped into the grooves 27, by means of the plate 32 passing beyond the latch 31, the paper is fed by the feed roll 26, friction between the feed roll and the paper being supplied by the gage 33 pressing the paper down on the roll, this being caused by the springs 35. The paper is then fed through as shown in Fig. 3, and is engaged by the duplicating sheet 39 and the duplicating roll 14 which presses the paper between itself and the impression roller 40 so that an impression is made on the paper and is fed off as a copy, being insured against following the duplicating sheet around by means of the fingers 41 on the rod 42, these fingers being adjustable by means of the set-screws 43, and are prevented from turning by these set-screws 43 fitting into a groove 44 in the rod 42.

The impression roller 40 is mounted in bearings, each bearing being constructed on the end of a lever 45, each lever being pivoted at 46 and being normally pulled, on one end, by a spring 47 held at 48 to the frame 10, and on the other end being caught into a perforation 49 in the end of the lever 45. Each lever, below the bearing on its end, is provided with a perforation 50, and in each perforation is a rod 51 arranged on a rock shaft 52, which rock shaft has, on the outside, a rod 53 which is operated by one end 54 of a lever 55, when it is desired to manually release the impression roller from the duplicating roll, this being sometimes necessary to remove a mutilated sheet, or when it is desired to rotate the duplicating roll to distribute the ink, or for similar purposes, without making any impression. This release of the impression roller is accomplished by pressing down on the lever 55 which tilts the rod 53 upward and oscillates the rock shaft 52, and the rods 51 then swing the levers 45 against the tension of the springs 47. The feeding plate 37 is slotted as at 56 and is held in place by a set-screw 57, so that the feeding plate can be adjusted and grasp the paper so as to feed it through to cause the paper to be impressed with its top near the top of the sheet, or it can be slid back so as to bring the edge of the imprint a considerable distance from the top of the sheet. The feeding plate 37 is preferably right-angled in cross section and forms a flat face for its engagement with the duplicating roll whereby it receives a substantial bearing and also forms a flat face for frictionally engaging the feed roll.

The gage and the fingers form a positive stop for a sheet to be fed, and when the fingers drop into the grooves on the feed roll 26 and the gage presses the sheet down on the feed roll, then the feeding plate 37 engages the feed roll and makes a positive feed for the sheet of paper and guides it, in conjunction with the top edge of the fingers 28, between the impression roller and duplicating sheet on the duplicating roll. The fenders 58 are secured on the ends of the fingers 41, these fenders being downwardly curved and serving to direct the paper downward after it is printed upon so that it is deposited in a tray which is conveniently placed underneath the machine, these fingers insuring each sheet going downward at the proper time and thus forming a compact pile of printed sheets.

To prevent the rotation in a reverse direction of the duplicating roll, I provide a brake, preferably the construction shown in Fig. 1, consisting of a brake-block 59 which is pivoted at one end to one of the side frames and has the teeth 60 thereon which engage the duplicating roll, if it is operated in the reverse direction, so that it is locked. The brake-block 59 is held in place by gravity, as will be evident.

Having thus described my invention, what I claim is:—

1. A duplicating machine comprising side plates, a duplicating roll mounted between the side plates, means for rotating the duplicating roll, an impression roller, a feed roll, a gage, means for normally forcing the gage in contact with the feeding roll, fingers arranged to rock and adapted to engage the gage, means for operating the fingers from the duplicating roll to cause them to lift the gage and to form, with the gage, a stop, and means for operating the feed roll from the duplicating roll when the fingers are disengaged from the gage.

2. A duplicating machine comprising side plates, a duplicating roll rotatably arranged between the side plates means for rotating the duplicating roll, an impression roller, a feed roll rotatably arranged between the side frames and normally out of contact with the periphery of the duplicating roll, an adjustable feeding plate on the periphery of the duplicating roll and adapted to rotate the feed roll at a predetermined point in the rotation of the duplicating roll, a rocking shaft, fingers on the rocking shaft, means on the duplicating roll for rocking the shaft in one direction, a spring for returning the shaft to its normal position, a gage adapted to swing, and a spring to normally force the gage in engagement with the

feed roll, the gage being adapted to be lifted by the fingers when the shaft is rocked.

3. A duplicating machine comprising side plates, a duplicating roll rotatably mounted between the side plates, means for rotating the duplicating roll, an impression roller, a feed roll, the feed roll being arranged rotatably between the side frames and normally out of contact with the periphery of the duplicating roll, a feeding plate adjustably arranged on the periphery of the duplicating roll, a rod secured to the side frames, a gage arranged to swing on the rod and normally engage the feed roll, a shaft adapted to rock, co-acting means on the shaft and on the duplicating roll for rocking the shaft, and fingers on the shaft adapted to engage the gage to lift it when the feed roll is not rotating.

4. A duplicating machine comprising side plates, a duplicating roll rotatably arranged between the side plates, means for rotating the duplicating roll, a feed roll having grooves therein, a shaft adapted to rock between the side plates, a latch on the shaft, a plate on the duplicating roll adapted to operate the latch to rock the shaft in one direction, a spring to return the shaft to its normal position, fingers on the shaft, said fingers being adapted to enter the grooves in the feed roll, a gage, and means for normally forcing the gage in contact with the feed roll, the gage being adapted to be lifted when the shaft is rocked to withdraw the fingers from the grooves in the feed roll.

5. A duplicating machine comprising side plates, a duplicating roll rotatably arranged between the side plates, means for rotating the duplicating roll, a feed roll having grooves therein, a shaft adapted to rock between the side plates, a latch on the shaft, a plate on the duplicating roll adapted to operate the latch to rock the shaft in one direction, a spring to return the shaft to its normal position, fingers on the shaft, said fingers being adapted to enter the grooves in the feed roll, a gage, means for normally forcing the gage in contact with the feed roll, the gage being adapted to be lifted when the shaft is rocked to withdraw the fingers from the grooves in the feed roll, and an adjustable feeding plate on the duplicating roll adapted to rotate the feed roll at a predetermined point in the rotation of the duplicating roll.

6. A duplicating machine comprising side frames, a duplicating roll rotatably mounted between the side frames, a feed roll having grooves therein, a shaft adapted to rock, fingers normally resting in the grooves in the feed roll, a gage, a shelf to conduct a sheet of paper to the top edge of the feed roll, and co-acting means on the shaft and on the duplicating roll for raising the fingers, the fingers acting to raise the gage whereby the juncture of the fingers and the gage provides a stop for the feeding of the sheet.

7. A duplicating machine comprising side frames, a duplicating roll rotatably mounted between the side frames, a duplicating sheet on the duplicating roll, a bar secured to the side frames, fingers secured to the bar, the fingers being tapered and having their points in proximity to the duplicating sheet, means for securing the fingers on the bar, and downwardly curved fenders on the back of the fingers.

8. A duplicating machine comprising side frames, a duplicating roll rotatably mounted between the side frames, a lever pivotally secured to each side frame, each lever having a bearing in one end, an impression roller mounted in the bearings, springs, each spring having one end secured to one end of one lever and its other end secured to a side frame, each lever being provided with a perforation, a rock shaft, rods secured to the rock shaft and entering the perforations in the levers, an outside rod projecting from the rock shaft, and a lever pivoted to one of the side frames and arranged to engage the outside rod.

In testimony, that I claim the foregoing, I have hereunto set my hand this 1st day of March, 1910.

GEORGE WOOD.

Witnesses:
WM. H. CAMFIELD,
E. A. PELL.