R. H. & W. J. ARNEY.

MACHINE FOR CUTTING AND PRINTING BANK NOTES.

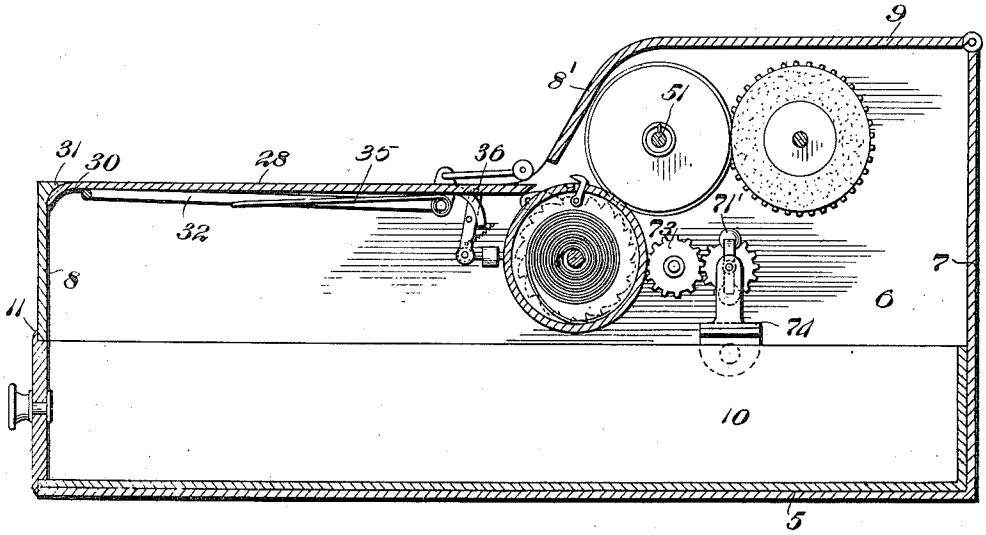
APPLICATION FILED FEB. 8, 1911.

1,036,774.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



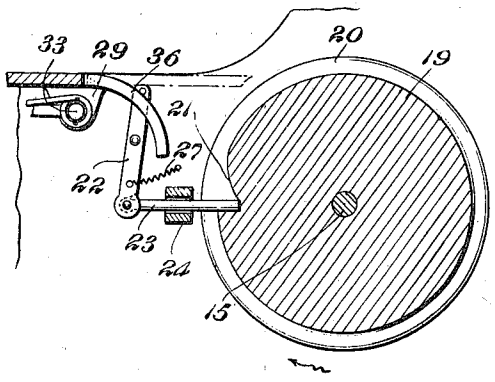


Fig. 4.

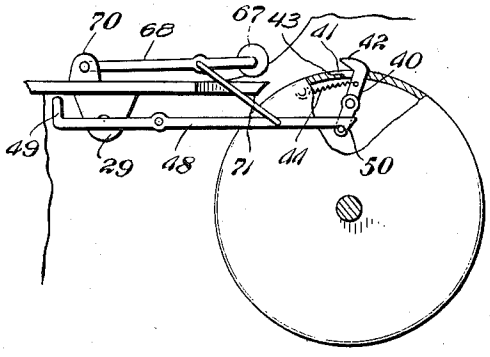


Fig. 5.

Witnesses

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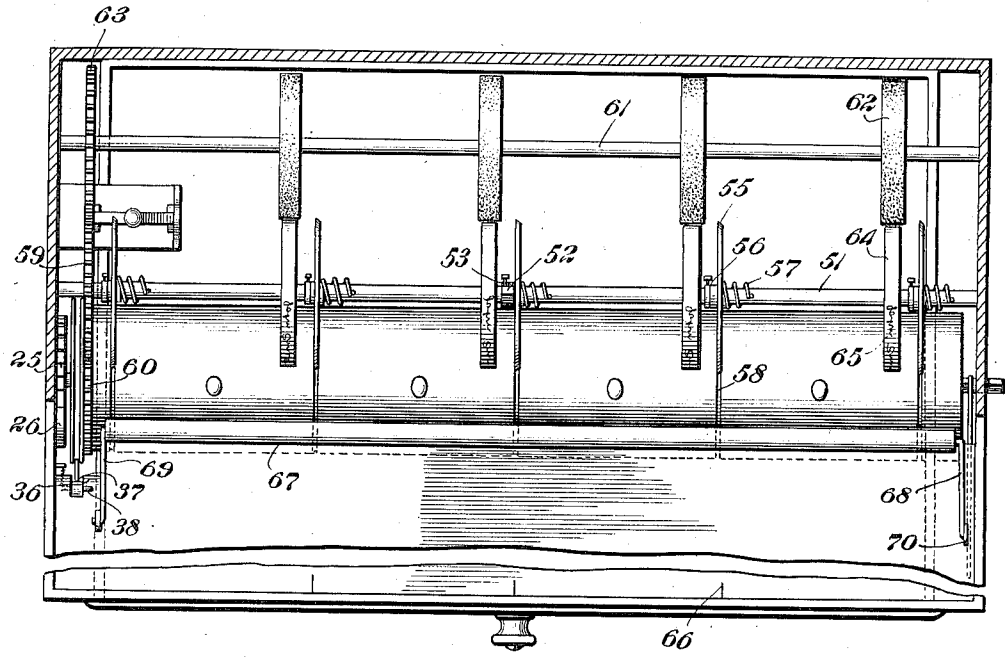
2 SHEETS—SHEET 2.

Fig. 2.



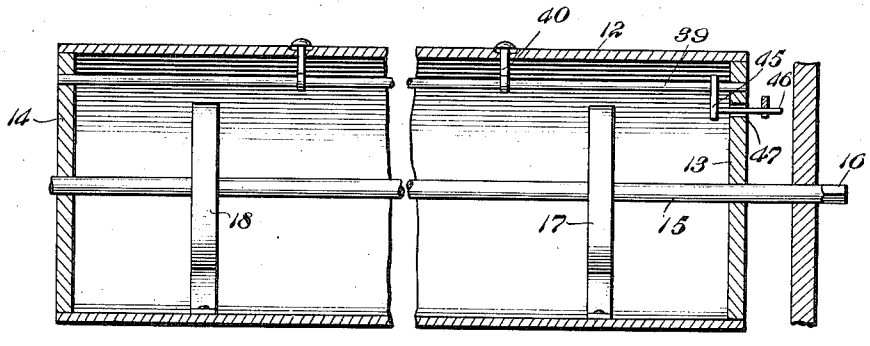


Fig. 3.

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MACHINE FOR CUTTING AND PRINTING BANK-NOTES.

1,036,774. Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed February 8, 1911. Serial No. 607,350.

To all whom it may concern:

Be it known that we, ROBERT H. ARNEY and WILLIAM J. ARNEY, citizens of the United States, and residents of Toms River, Ocean county, State of New Jersey, and Potts Grove, Northumberland county, State of Pennsylvania, respectively, have invented certain new and useful Improvements in Machines for Cutting and Printing Bank-Notes, of which the following is a specification.

This invention relates broadly to devices for printing and cutting paper and has specific relation to machines of that type adapted to operate on sheets of bank notes.

One object of the invention is the provision of a device adapted to simultaneously divide a sheet of bank notes and print thereon the signatures of the officers of the bank.

The above and other objects will appear and be better understood from the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a vertical longitudinal sectional view. Fig. 2 is a plan view partly in section. Fig. 3 is an enlarged longitudinal section of the carrier and a portion of its support also showing the gripping mechanism and the means for actuating the carrier. Fig. 4 is an enlarged detail partly in section of the mechanism for holding the carrier against movement. Fig. 5 is an enlarged end view of the carrier partly broken and also showing one of the grippers and the mechanism for releasing and setting the same.

The carrier, printing and cutting devices are arranged in a suitable casing which comprises a bottom 5, side walls 6 and end walls 7 and 8. The end walls 7 and 8 are unequal in height and are secured in the ordinary manner to the opposite end portions of the side walls 6. A portion of the upper side of each of the side walls 6 is cut away so as to conform to the height of the shorter end wall 8. A cover 9 is hinged to the upper end of the higher end wall 7, the free end portion of the cover being curved downwardly as shown at 8′ so as to substantially cover the end of the space between the uncut side portions of the side walls 6. The opposite sides of the cover 9 are adapted to bear on the upper edge portions of the side walls 6 when the cover is lowered as shown in Fig. 1. An opening is formed in the lower portion of the lower end wall 8, the said opening being somewhat less in length than the length of the said end wall and receives a drawer or receptacle 10. The inner end of the drawer 10 bears on the end wall 7, and the opposite side portions of the outer end are rabbeted as shown at 11 to engage the upper side of the opening in the end wall 8 and end portion of the bottom 5.

The carrier comprises a hollow cylindrical body 12 provided at its opposite ends with heads 13 and 14. The heads 13 and 14 are provided with alining central openings which loosely receive the opposite end portions of a shaft 15. The ends of the shaft 15 are journaled in openings in the side walls 6, the said openings being located substantially in vertical alinement with the free end portion of the cover 9 when the latter is lowered as shown in Fig. 1. One end of the shaft 15 extends through one of the side walls 6 and is squared as shown at 16 to receive a key or other suitable tool for turning the shaft. Coiled around the shaft 15 and located in the cylinder are coil springs 17 and 18. The inner ends of said springs are secured to the shaft 15 and the outer ends to the inner surface of the cylinder 12. Secured to the shaft 15 and arranged between the end wall 14 of the carrier and adjacent side wall of the casing is a sheave 19, the peripheral groove 20 of which acts as a guide. Formed in the groove 20 is a socket having a beveled side wall 21. A lever 22 is pivoted at its intermediate portion to the side wall of the casing and pivoted to the lower end of the lever 22 is one end of a keeper 23 which extends through a guide 24 arranged on the inner surface of the side wall of the casing,

the free end of the keeper extends into the socket 21 as shown in Fig. 4. Secured to the shaft 15 between the side wall of the casing and sheave 19 is a ratchet 25, the teeth of which engage a pawl 26 secured to the side wall of the casing. With this construction it will be seen when the springs are tensioned by turning the shaft 15, the pawl and keeper 23 will coöperate to prevent turning movement of the carrier, the keeper being yieldingly held in engagement with the socket by means of a helical spring 27, the ends of which are secured to the side wall and lever 22.

A plate 28 is arranged between the side walls 6 and below the downturned portion 8′ of the cover. The plate adjacent to one end is provided with depending lugs 29 which are pivoted to the opposed inner faces of the side walls 6. The opposite end portion of the plate or that adjacent to the end wall 8 is curved downwardly as shown at 30 and engages with a lateral shoulder 31 on the upper end portion of the end wall 8, the shoulder 31 serving to limit upward and outward movement of the curved end portion 30 of the plate. The plate is normally maintained in horizontal position as shown in Fig. 1 by means of a yoke 32, the opposite end portions of which are provided with eyes which loosely receive the pivot pins 33 for the lugs 29. Helical springs 34 are coiled around the pivot pins 33, one end portion of the said springs being suitably secured to the pins and the opposite end portions 35 are extended along a straight line and bear on the sides of the yoke.

Referring now to Fig. 2 it will be seen that a corner portion of the table 28 is curved downwardly as shown at 36. A slot 37 is formed in the curved portion 36 and receives the upper end portion of the lever 22. The upper end portion of the lever is provided with a laterally extending pin 38 which bears on the convex surface of the downturned portion 36 as shown in Fig. 1. Alining eccentric openings are formed in the ends 13 and 14 of the carrier and journaled in these openings are the opposite ends of a shaft 39. Secured to the shaft 39 are the inner ends of the shanks 40 of grippers. As shown in Fig. 2 four of these grippers are employed to correspond to the number of notes on a sheet. It will be understood, however, that a greater or less number may be employed as occasion may require. The shanks 40 extend through oblong openings 41 formed in the side wall 12 of the carrier and terminate in laterally extending fingers or engaging ends 42. The engaging ends 42 are received in seats 43 formed on the outer surface of the cylinder 12 and on one side of the openings 41.

As shown in Fig. 5 suitable retractile springs 44 are employed for moving the engaging ends into the seats 43, the said springs have their opposite ends secured to the shanks 40 and the inner surface of the cylinder 12. Secured to the shaft 39 and adjacent to one end thereof is a crank 45 provided with a handle 46 which extends through an arcuate opening 47 formed in the end 13 of the carrier. A lever 48 is pivoted to the side wall opposite to that to which the lever 22 is secured. One end portion of the lever 48 is bent upwardly as shown at 49 and extends to a point adjacent to the lower surface of the table 28. The opposite end portion of the lever 48 is provided on its lower side with a lug 50 to engage the crank handle 46. It might here be stated that when the keeper 23 engages with the sheave as shown in Fig. 4, the shaft 39 will be turned through the engagement between the handle 46 and lug 50 sufficiently to rock the grippers so that the engaging ends 42 thereof will move out of the seats 43. Journaled in the side walls 6 and at points above and to the rear of the shaft 15 are the opposite ends of a shaft 51. The shaft 51 is provided at spaced intervals with squared portions 52. The squared portions 52 are provided at one end with flanges 53. Cutter disks 55 are centrally provided with hubs 56 having squared openings for the reception of the squared portions 52 and of less diameter than the flanges 53. The disks 55 are pressed toward the flanges 53 by means of helical springs 57 each of which surrounds the shaft 51 and has one terminal secured thereto and its opposite terminal bearing on the adjacent faces of the disks. The cylindrical wall 12 of the carrier is exteriorly provided with a plurality of spaced circular grooves 58 which coöperate with the cutting edge portions of the disks to form a shear. Connection between the shafts 15 and 51 is established by means of gears 59 and 60 secured to the shafts 51 and 15 respectively, the gear 60 being positioned between the end 14 and sheave 19. Journaled in the side walls 6 and extending parallel with the shaft 51 is a shaft 61 provided at spaced intervals with disks 62 formed of felt or other suitable absorbent material adapted to hold ink. One end of the shaft 61 is provided with a gear 63, the teeth of which mesh with the crown gear 59. The number of teeth in the gear 63 will slightly exceed those in the gear 59 so that the shaft 61 will rotate at a slower rate of speed than the shaft 51. Secured to the shaft 51 are a plurality of metallic disks 64. The disks 64 are in alinement with the ink-holding disks 62 and are provided on their peripheries with type 65 which are inked by the disks 62. It will be understood

that the letters on the disks 64 will correspond to those in the names of the officers of the bank.

In the operation of the device thus far described the usual sized sheet which contains four bank notes is placed upon the plate 28. It might here be stated that these sheets usually contain four bank notes and there is a considerable margin at the opposite ends of the sheet or beyond the outer notes. The cutter disks 55 and grooves 58 are spaced apart so that they correspond with the longitudinal edges of the notes, whereby the intermediate disks 55, three in number, serve to quarter the sheet and the outer disks serve to remove a portion of the aforesaid wide margin at the opposite sides of the sheet. The sheet is moved toward the carrier and is properly registered by bringing the middle portions of the spaces between the notes into alinement with the grooves 58 on the carrier and with gage marks 66 at the front end portion of the table as shown in Fig. 2. When the sheet is so positioned the front end portion of the table is slightly depressed whereupon the lower surface of the table will contact with the upturned end portion 49 of the lever moving the same downwardly, and the opposite or lugged end of the lever will be moved upwardly and out of engagement with the handle 46. As soon as disengagement is effected between the handle and lug the engaging ends of the grippers will move forwardly and into the seats 43, it being understood that prior to this the adjacent end portion of the sheet has been moved to a position over the said seats. When the grippers enter the seats 43 the end of the sheet will be securely clamped to the carrier. After the grippers engage the sheet the forward end of the plate 28 is further depressed, whereupon the inner end of the plate will move farther upward and as it does so the downturned corner portion which engages with the pin 38 will cam the upper end of the lever 22 rearwardly until the keeper 23 moves from engagement with the socket in the sheave 19. It being understood that the springs 17 and 18 have been tensioned before hand it is obvious when disengagement between the keeper and sheave has been effected, that the action of the springs will rotate the carrier and the shafts 51 and 61 through their connection with the shaft 15 and the parts connected to the said shafts 51 and 61 will be likewise rotated. As the carrier rotates, the sheet will therefore be drawn from the table, divided by the cutter disks and stamped by the type on the disks 65. It will of course be understood that the circumference of the carrier will be so proportioned to the length of the sheet that by the time the carrier has completed substantially three-fourths of a full revolution the free end of the sheet will have been operated upon by the cutter disks so that as the carrier is about to move to the position shown in Fig. 1 the free end of the sheet will have fallen into the receptacle or drawer 10. It will be further understood that the diameters of the printing disks and carrier will be so proportioned that the names of the bank officers will be stamped on the proper portions of the notes. After the keeper has been moved from engagement with the sheave 19 the plate 28 is released and the forward end portion thereof moves upwardly under the action of the springs 35, whereupon the free end of the keeper will contact with the floor of the groove 20 as the sheave rotates. It will be understood at this time the spring 27 will be tensioned and the sheave rotating in the direction of the arrow as shown in Fig. 4 so that when the beveled side portion 21 of the socket moves into alinement with the keeper the spring 27 will move the free end portion of the keeper inwardly until the abrupt side of the carrier engages with the keeper, whereupon turning movement of the carrier will be prevented. Prior to the action of the keeper just described the handle 46 as the carrier rotates will engage the lug 50 on the lever 48, whereupon the shaft 39 will be moved relatively to the carrier and the grippers rocked so that the engaging ends thereof will move from the seats 43 and also from engagement with the notes. It will be remembered that the free end portions of the notes prior to the disengagement of the grippers, are in the receptacle 10 so that when the grippers have been disengaged in the manner just described the upper end portions of the notes will slide downwardly through the space between the rear end of the plate and adjacent surface of the follower and into the receptacle 10. When the sheets of bank notes are received at the bank they are usually folded upon themselves at their middles whereby a well defined crease is formed in each note. We have found that by virtue of this creasing there is a tendency of the note to buckle as it is drawn by the carrier.

In order that the note may be guided and held against lateral movement during the turning movement of the carrier we have provided a roll 67. This member corresponds approximately in length to the width of the plate 28 and is journaled at its opposite ends on arms 68 and 69. The arms 68 and 69 have their free end portions turned outwardly and laterally, such laterally and outwardly turned portions being loosely received by openings in lugs 70 at the opposite sides of the plate 28 and adjacent to the rear end portion thereof. The roll 67 is normally held in spaced relation to the up-

per surface of the table by means of a link 71, the opposite ends of which are pivotally connected to the lever 48 and the arm 68. By maintaining the roll 67 in spaced relation to the plate 28 the end portion of the sheet may be inserted through the space between the adjacent surfaces of the plate and roll when first positioning the sheet on the carrier. After the grippers have been released in the manner before described and the keeper disengaged from the socket in the sheave the forward end portion of the table, as before stated moves upwardly under the action of its spring and in contact with the shoulder 31, whereupon the lugged end of the lever will gravitate carrying the roll 67 into contact with the paper on the table 25.

In Fig. 1 we have shown a suitable form of centrifugal governor 71′ connected by a train of gearing 73 with the gear 60 on the shaft 15. The governor bracket 74 is secured to the inner surface of one of the side walls 6 of the casing.

Having thus described the invention what we claim as new is:

1. In a device of the class described, the combination with a support, of a power driven rotary carrier associated therewith, means for holding the carrier against movement, a movable sheet holding platform associated with the support and adapted to release the carrier holding means, and means on the carrier adapted to grip the sheet when the carrier is released and withdraw the sheet from said platform.

2. In a device of the class described, the combination with a support, of a power driven carrier associated therewith, means for holding the carrier against movement, a gripper, means for holding the gripper out of engagement with the carrier, and a movable sheet holding platform associated with the support and adapted to release the carrier and gripper holding means.

3. In a device of the class described, the combination with a support, of a power driven carrier associated therewith, and provided with a gripper, means for holding the gripper in open position, means for holding the carrier against movement, and a movable sheet holding platform associated with the carrier and adapted to release successively the gripper and carrier holding means.

4. In a device of the class described, the combination with a support, of a carrier associated therewith, a gripper associated with the carrier, means for holding the engaging end of the gripper out of engagement with the carrier, and a movable sheet holding platform associated with the support and adapted to release the gripper holding means.

5. In a device of the class described, the combination with a support, of a movable carrier associated therewith, a movable sheet holding platform associated with the support, a movable sheet guide associated with the platform and adapted to bear upon the platform while the carrier is in motion, and means for moving the sheet guide away from the platform when the carrier comes to rest.

6. In a device of the class described, the combination with a support, of a movable carrier associated therewith, a movable sheet holding platform associated with the support, a movable sheet guide associated with the platform and adapted to bear upon the platform while the carrier is in motion, and means actuated by the carrier for moving the sheet guide away from the platform when the carrier comes to rest.

7. In a device of the class described the combination with a support; of a carrier arranged thereon, means for moving the carrier, a latch for holding the carrier against movement, a gripper supported by the carrier and having an engaging end yieldingly held in contact with the carrier, means for holding the engaging end of the gripper out of contact with the carrier, and movable means for releasing the gripper holding means and the latch.

8. In a device of the class described the combination with a support; of a carrier arranged thereon, means for moving the carrier, a latch for holding the carrier against movement, a gripper supported by the carrier and having an engaging end yieldingly held in contact with the carrier, means for holding the engaging end of the gripper out of contact with the carrier, and a plate pivoted on the support and adapted to release the gripper holding means in advance of the latch.

9. In a device of the class described the combination with a support; of a carrier arranged thereon, a movable gripper on the carrier, means for holding the gripper in inoperative position, a plate pivoted on the support and adapted when moved to release the gripper holding means, a roller supported in spaced relation to the plate and connected to the gripper holding means, and movable by the latter into contact with the plate after the gripper is released.

10. In a device of the class described, a casing open at one end, a carrier located in the casing, means for holding the carrier against movement and a manually operable sheet holding plate yieldingly supported in the open end of the casing and adapted when moved to effect disengagement between the carrier holding means and the carrier.

11. In a device of the class described, the combination with a support; of a carrier arranged thereon, a spring acting gripper associated with the carrier, a marking device

coöperating with the carrier, means for moving the carrier, means for holding the carrier against the action of its moving means, means for disengaging the carrier holding means from the carrier, a lever connected to the support and adapted to hold the engaging end of the gripper from contact with the carrier, said lever being adapted to be operated by the means for releasing the carrier holding means, to release the gripper to engage with the carrier and further adapted to engage the gripper and move the same from engagement with the carrier while the latter is moving.

In testimony whereof we affix our signatures each in presence of two witnesses.

ROBERT H. ARNEY.
WILLIAM J. ARNEY.

Witnesses as to the signature of Robert H. Arney:

HENRY A. LOW,
WILLIAM J. GRULER.

Witnesses as to the signature of William J. Arney:

H. H. HOFFMAN,
U. S. BUBB.