

L. H. COLBURN & F. F. CLARKE.
CURRENCY CUTTING MACHINE.
APPLICATION FILED APR. 2, 1912.

1,044,990.

Patented Nov. 19, 1912.

5 SHEETS—SHEET 1.

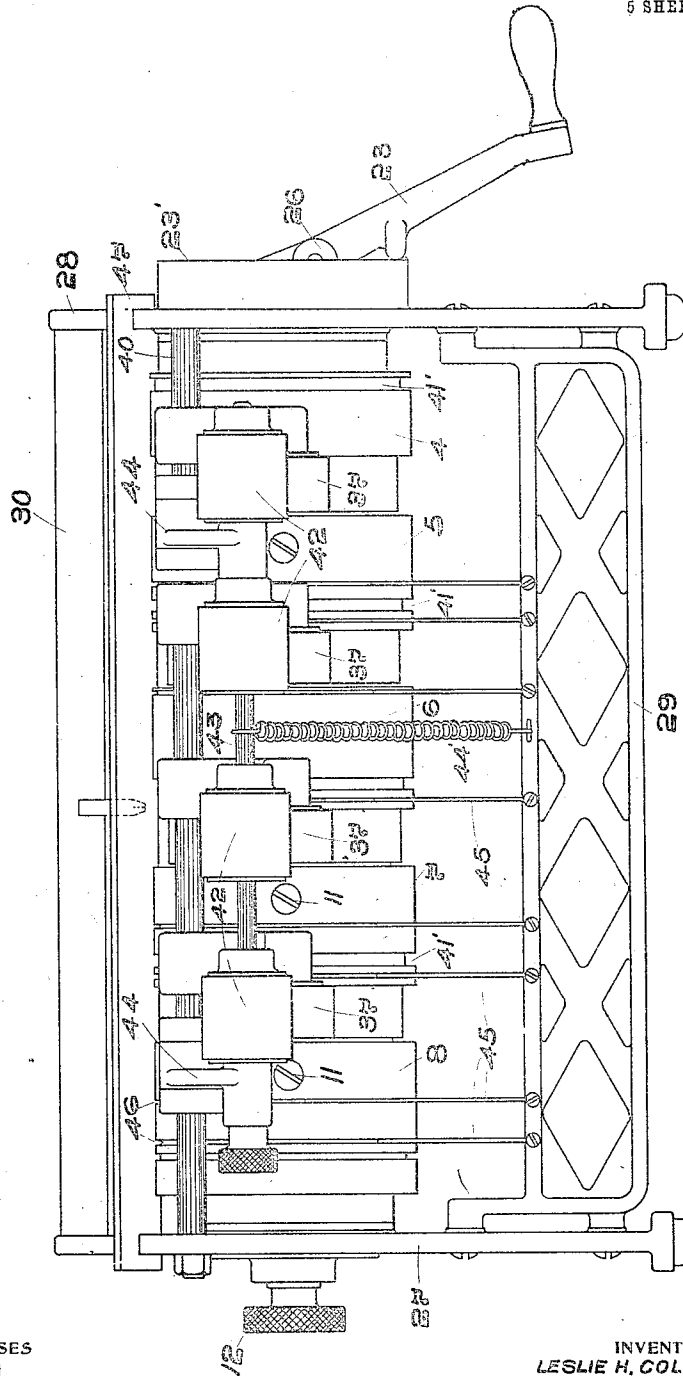


FIG. 1

WITNESSES

W. W. Davidson
H. J. Johnson

INVENTOR
LESLIE H. COLBURN &
FREDERICK F. CLARKE

Edward W. Luman
ATTORNEY

L. H. COLBURN & F. F. CLARKE.
CURRENCY CUTTING MACHINE.
APPLICATION FILED APR. 2, 1912.

1,044,990.

Patented Nov. 19, 1912.

5 SHEETS—SHEET 2.

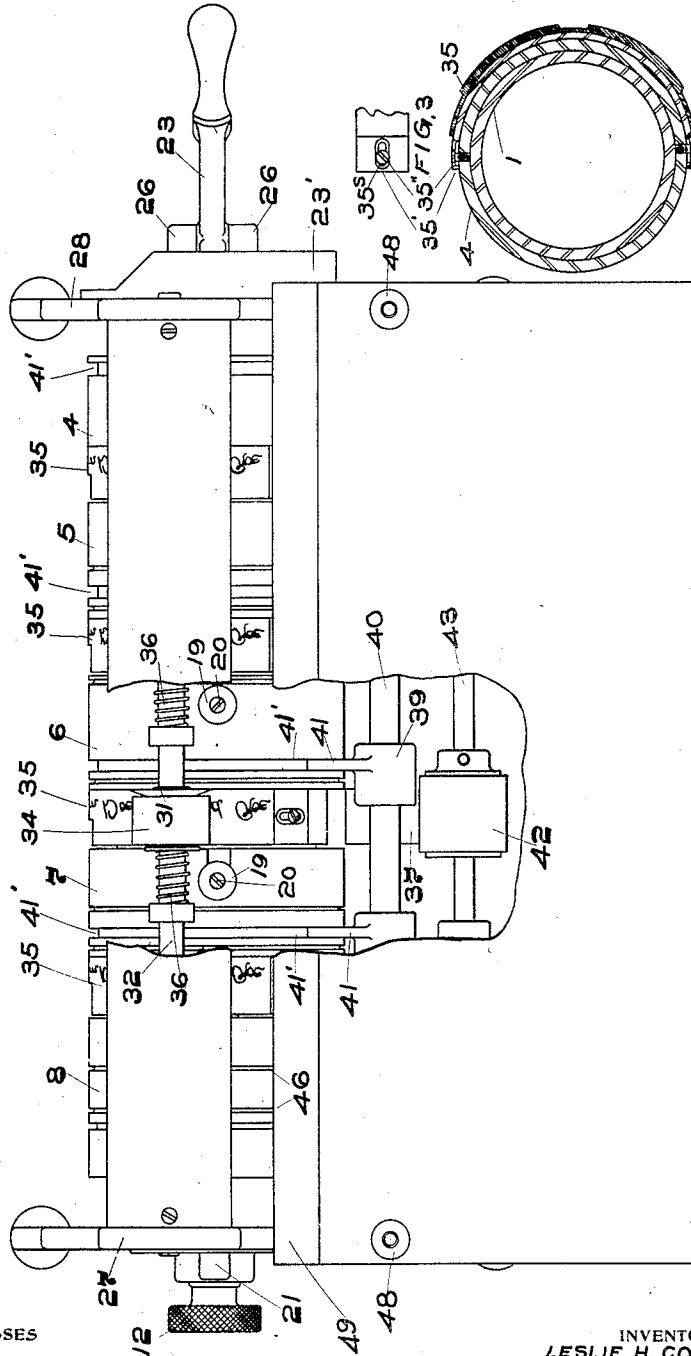


FIG. 4.

FIG. 2.

WITNESSES

W. C. Dawson
H. G. Johnson

INVENTOR
LESLIE H. COLBURN
FREDERICK F. CLARKE
BY *Edward P. Inman*
ATTORNEY

L. H. COLBURN & F. F. CLARKE.
CURRENCY CUTTING MACHINE.
APPLICATION FILED APR. 2, 1912.

1,044,990.

Patented Nov. 19, 1912.

5 SHEETS—SHEET 3.

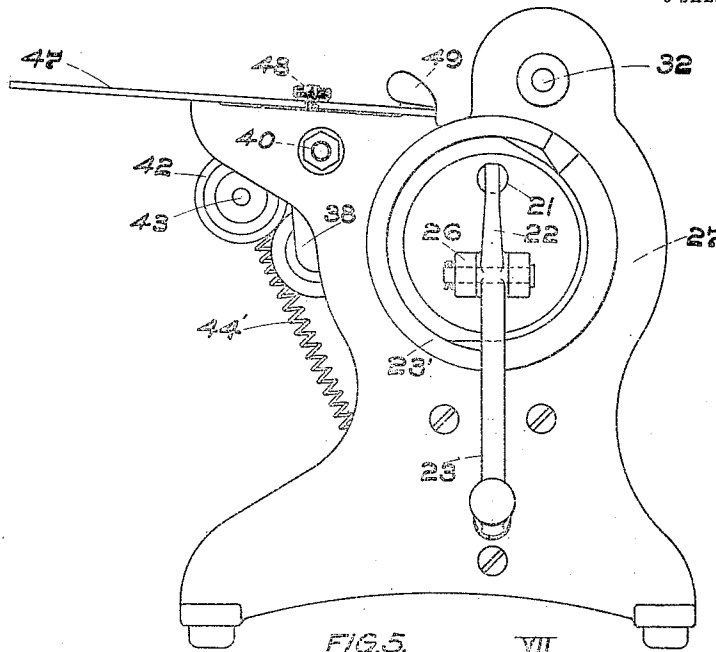


FIG. 5.

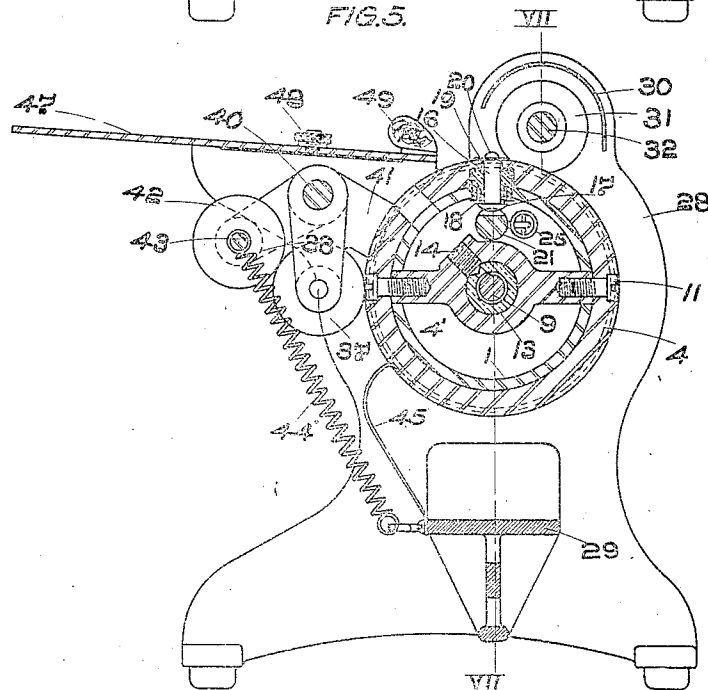


FIG. 6.

WITNESSES

W. C. Davidson
H. G. Johnson

INVENTORS

LESLIE H. COLBURN &
FREDERICK F. CLARKE

BY *Edward R. Inman*
ATTORNEY

L. H. COLBURN & F. F. CLARKE.
CURRENCY CUTTING MACHINE.
APPLICATION FILED APR. 2, 1912.

1,044,990.

Patented Nov. 19, 1912.

5 SHEETS—SHEET 4.

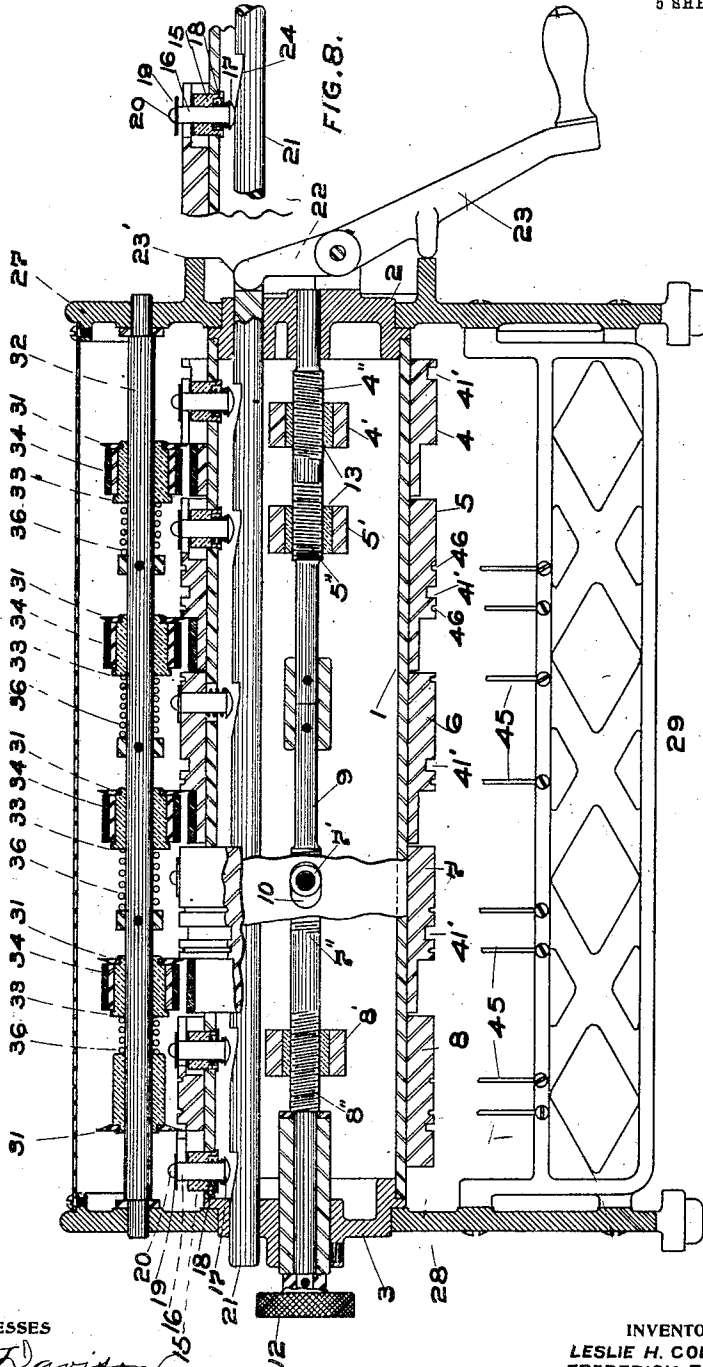


FIG. 7.

WITNESSES

W. W. Davidson
H. G. Johnson

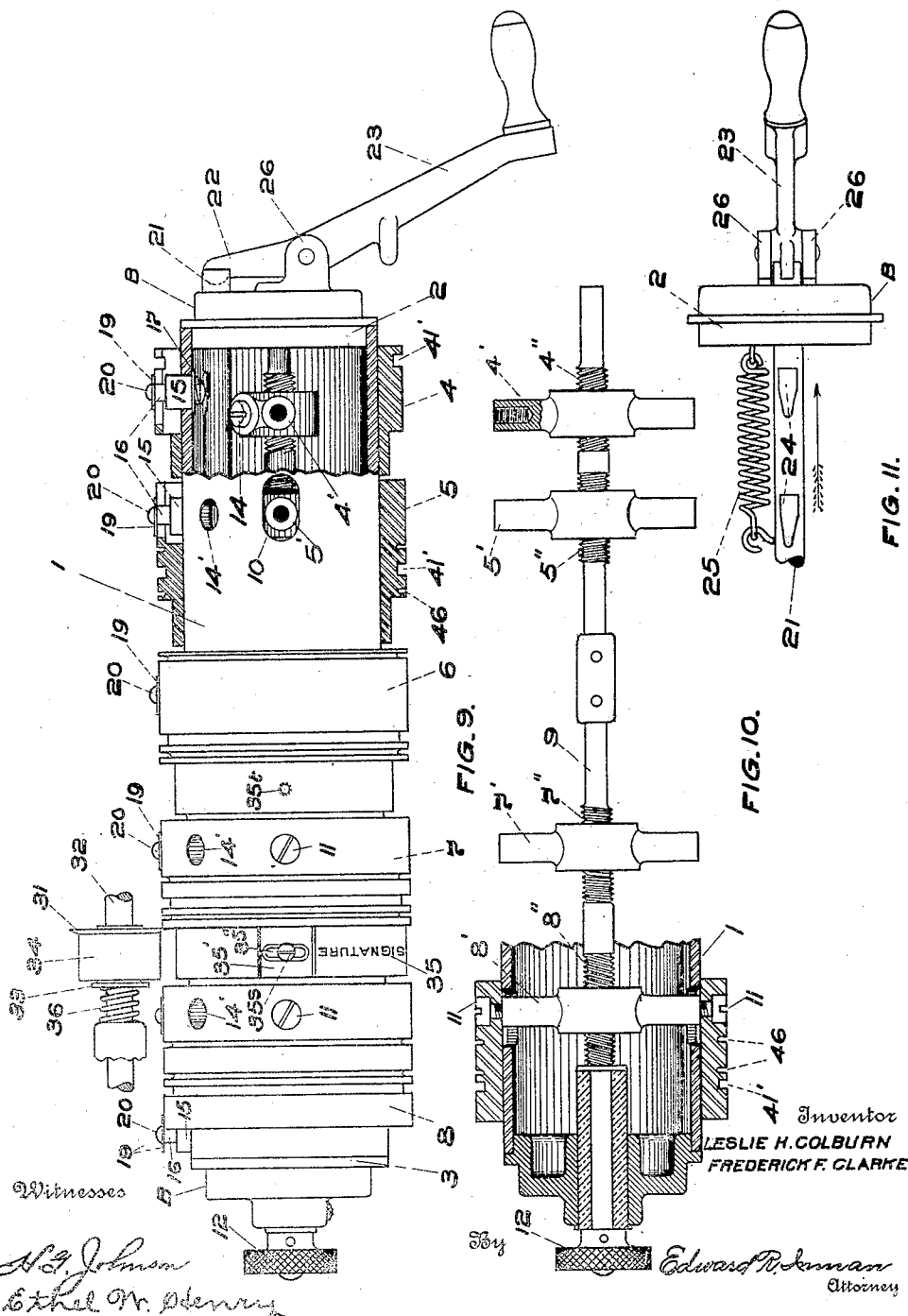
INVENTORS
LESLIE H. COLBURN &
FREDERICK F. CLARKE
BY *Edward D. Johnson*
ATTORNEY

L. H. COLBURN & F. F. CLARKE.
CURRENCY CUTTING MACHINE.
APPLICATION FILED APR. 2, 1912.

1,044,990.

Patented Nov. 19, 1912.

5 SHEETS-SHEET 5.



UNITED STATES PATENT OFFICE.

LESLIE H. COLBURN AND FREDERICK F. CLARKE, OF FRANKLIN, PENNSYLVANIA.

CURRENCY-CUTTING MACHINE.

1,044,990.

Specification of Letters Patent.

Patented Nov. 19, 1912.

Application filed April 2, 1912. Serial No. 688,090.

To all whom it may concern:

Be it known that we, LESLIE H. COLBURN and FREDERICK F. CLARKE, citizens of the United States, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Currency-Cutting Machines, of which the following is a specification.

The object, construction and operation of our invention are herein set forth with sufficient clearness to enable those skilled in the art to which it appertains, to make and use the same.

The object of our invention is, to provide a machine for use in banks, whereby bank notes, as they come in sheets from the Bureau of Engraving and Printing, may be cut into the individual notes or bills, and at the same time printed with a facsimile of the signature of the proper officials of the issuing bank, upon said bills.

The construction of our improved currency-cutting and signature-printing machine, is herein fully described, reference being had to the accompanying drawings, which form a part hereof,—the various figures of which are as follows:—

Figure 1 is a front elevation of our complete machine. Fig. 2 is a plan view of same, with portions broken away to show the construction more clearly. Figs. 3 and 4 are details of the printing mechanism. Fig. 5 is an end elevation. Fig. 6 is a vertical section on line VI VI of Fig. 7. Fig. 7 is a central vertical section on line VII VII of Fig. 6. Fig. 8 is a detail of the paper-clamping device. Fig. 9 shows the cylinder removed from the frame, two of the collars being shown in section, and a portion of the barrel-wall broken away at one end for the purpose of giving a clear idea of certain of the related mechanism. Fig. 10 shows a small portion of one end of the barrel, also a collar in section, together with the mechanism whereby the collars are adjusted longitudinally upon the cylinders. Fig. 11 is a detail.

The same reference characters are applied to identical parts in all the views.

Before entering into a detailed description of the construction and operation of our improved currency-cutting and signature-printing machine, it is believed that such description will be more readily understood, if

the construction is first set forth in general terms.

As currency or bank notes are received by the issuing banks, from the Bureau of Engraving and Printing, they are in sheets comprising four bills each; these must be cut into the individual notes and signed by the proper officials of said issuing bank, before they are issued. Our machine is designed for this purpose, so that it will cut the four bills all at one operation and trim the outside edges of the same, also print in the proper place a facsimile of said signatures, if desired.

The essential feature of our machine consists of a revoluble cylinder, composed of a barrel upon which five rings or collars are mounted, all of which, with the exception of the central one, are adjustable longitudinally of said barrel, for the purpose of adapting our machine to certain variations of width of bills, which appear to exist between bills of various denominations. Co-operating with said collars, are five edged disks or knives, which sever the bills as they are carried around by said cylinder.—suitable clamping devices being provided for this purpose, upon the periphery of said cylinder, which clamp the bills thereto. Said cylinder is revolubly mounted in a suitable frame, and provided with means for manually revolving same. Inking devices are provided for automatically inking the signature-type; also suitable means for adjusting said collars.

In detail, the construction here shown is as follows:—A cylinder, which is the main element of our machine—see Fig. 9, consists of a barrel 1, composed preferably of a suitable piece of pipe or tubing, and in each end of this, is rigidly secured a head 2, 3 respectively. Upon the outside of said barrel are placed a number of collars 4, 5, 6, 7, 8, all of which, with the exception of 6, are longitudinally adjustable upon barrel 1. The means whereby said collars are adjusted is clearly shown in Figs. 9 and 10, and consists of the following details: A rod 9 passes centrally through the cylinder, and at suitable points, corresponding to the positions of collars 4, 5, 7, 8, said rod is screw-threaded, and upon each of the screw-threaded portions is mounted a two-armed spider 4', 5', 7' and 8'. The extremity of each arm of said spider projects into a slot 10 in the barrel 1, and

said extremities are each provided with a tapped hole for the reception of a screw 11, by means of which the various collars 4, 5, 7, and 8 are attached to their respective spiders, and by means of which said collars are adapted to be adjusted longitudinally upon the barrel 1. Collar 6 is not longitudinally adjustable, but is stationary upon said barrel; the collars 4, 5, 7, 8 are adjustable toward collar 6. Twice as much adjustment is provided for collars 4 and 8 as is given to collars 5 and 7, for reasons which will be presently set forth, and said differential adjustment is provided for by making the lead of threads 4" and 8" twice that of threads 5" and 7". Threads 4", 5" are the reverse of threads 7", 8"—that is, if threads 4" and 5" are right-hand threads, 7" and 8" should be left-hand threads. Rod 9 is provided upon one end with a knurled knob 12, for the purpose of revolving said rod, when adjustments of said collars are to be made.

By a reference to Fig. 7, it will be noted that each spider is provided with a bushing 13, through which rod 9 passes, and it is this bushing which is threaded to cooperate with the threads upon said rod 9. Each spider is also adjustable upon its respective bushing, and when the desired relative adjustment has been secured between these two elements, a set-screw 14, Fig. 9,—which passes through the hub of the spider, and is arranged to bear upon said bushing,—is tightened up, and said adjustment is thereby made permanent and need not again be disturbed. A hole 14' is provided through the collars and the barrel, for the purpose of inserting a screw-driver to operate said screw 14.

Several clamps are provided upon the cylinder, for the purpose of engaging the edges of the sheets which are to be cut. Said clamps and the mechanism for actuating same, are as follows, reference being had to either Fig. 7, 8 or 9:—Inasmuch as all of said clamps are substantially identical in construction, a description of one may be read upon any of them. A boss 15 is rigidly and firmly inserted through the barrel 1, and a pin 16 passes loosely through said boss. Said pin 16 is provided upon its inner end with a head 17, against which one end of a spiral spring 18 rests. To the outer end of pin 16 is secured a disk or washer 19, by means of a screw 20. Said washer is adapted to seat upon the periphery of one of the collars 4, 5, 6, etc., and the normal action of spring 18 is, to hold said washer firmly in contact with said periphery. For the purpose of actuating said clips, I provide a cam-rod 21, which passes longitudinally through the cylinder, and is movable endwise therein, with its respective ends projecting through the heads 2 and 3; one end of said rod being arranged to engage the lever 22 of the crank 23, which serves to re-

volve the cylinder. Rod 21 is provided with a number of inclined cam-notches 24, one of which is located beneath each clamp. A spiral spring 25 is attached at one end to rod 21 and at the other end to head 2, and the normal pull or action of said spring upon said rod, is toward head 2, or in the direction indicated by the arrow; said rod 21 is moved in the opposite direction by the crank-lever 22, which is pivoted between the lugs 26. The operation of said clamping devices is as follows:—When the lower end of said handle 23 is moved outward,—as shown especially in Figs. 7 or 9, it causes said rod to move in the direction opposite to that indicated by the arrow in Fig. 11; the notch 24 moves beneath pin 16, and the action of spring 18 moves pin 16 downward until the washer 19 bears firmly upon the periphery of its respective ring, which periphery preferably is slightly flattened at this point, to form a suitable seat for said washer and insure a proper clamping action between the juxtaposed faces of said ring and washer. When the crank-arm 23 moves inward, a movement of rod 21 in the direction indicated by the arrow in Fig. 11 is caused by the spring 25, and the inclined face of a notch 24 impinges upon the juxtaposed end or head 17 of pin 16 and lifts the same from contact with its respective collar, as shown in Fig. 8, thus releasing the engagement of the clamp from the paper.

Upon the frame end 27, a circular rib or cam 23' (see Fig. 5) of somewhat more than a half-circle in extent, is provided, upon the outer face of which crank-lever 23 impinges or travels as it is turned. Said travel of the crank-lever upon said cam begins as soon as the cylinder starts to revolve, and continues until the cutting of the bills is complete, at which point, or soon thereafter, said impingement discontinues. Said cam is for the purpose of locking rod 21 in the position shown in Fig. 7, and against the action of spring 25, while the cutting is being done, as otherwise the operator might accidentally let the crank-handle slip from his hand and the clamps would then rise and release the sheet before the operation was complete.

Each head 2, 3 is suitably formed into a bearing at 8, so that the cylinder may be revolvably mounted in the end pieces 27, 28 of a suitably constructed frame, which end pieces are secured together by means of a cross-piece 29 and the piece 30 at the top, which piece 30 also serves another purpose, that will presently be set forth.

Above the cylinder are mounted a number of edged cutting-disks 31, each so arranged that it cooperates with a lateral edge of one of the collars, to produce a shearing action, and together these two elements cooperate to cut the sheet of currency into

bills, as the sheet is carried around with the cylinder. Said disks 31 are revolubly mounted upon the shaft 32 and said shaft 32 is, in turn, revolubly mounted in the end pieces 27 and 28. Each disk, with one exception, (which will be readily noted), is continued at one side into a hub or roller 33, which is provided with a rubber periphery or face 34, so that the same will form a suitable platen, against which the currency is pressed by the printing-type 35, when the facsimile signature is being printed. Each disk 31 is pressed and retained firmly against said lateral face of its respective cooperating collar, by means of a spiral spring 36 and through this arrangement, said disks are caused to revolve by friction alone, no other means being employed to cause their revolution.

In order to insure the proper release of the cut notes from their respective collars 5, 6, 7 and 8, or to prevent, for any reason, their adhesion thereto, so that they might be accidentally carried up into contact with or beneath the ink-roller 37, and thus become soiled with ink, we provide suitable guards or release-fingers, consisting of wires 45, the lower end of each of which is attached to the cross-piece 29, from whence it extends upward, and is then formed into an arch or return-bend, which causes the free end to extend somewhat downward, and it then enters a narrow groove 46, one or more of which are formed in each of the collars of the cylinder, and being so positioned, it is impossible for the ends of the bills to pass by said guards. It should be here stated that, at the time the forward end of the bill reaches the guards 45, the cutting and printing has been completed and the clamps have automatically released their hold.

A suitable table 47 is attached to the frame of the machine, and its front edge is positioned in close proximity to the cylinder, as shown in Figs. 2, 5 and 6. Said table is secured to the end pieces 27 and 28, of the frame, by means of the thumb-nuts 48, and by removing these, the table may be readily removed for the purpose of ready access to the parts beneath the same, and the cylinder. To the front edge of said table is secured strip 49, beneath which the sheet passes as it is operated upon; said strip is so positioned that there is but a narrow space between its lower face and table 47. Said strip is for the purpose of causing the sheet to lie flat and to pass through the machine without buckling or wrinkling, thus insuring uniformity and accuracy in the width of the respective bills. Strip 49 acts also to guide the sheet squarely under the clamps and flattens it out so that it will lie true upon the cylinder.

While we have here shown a currency-cutting and signature-printing machine, we

do not wish it to be understood that we desire at all times to confine ourselves to this precise combination, as the signature-type and the inking-equipment therefor could be omitted, without departing from our inventive idea.

The operation of our machine is as follows: A sheet of bank notes is placed upon the table 47 and moved forward until its forward edge passes under the washers or disks 19, and comes in contact with the pins 16, said washers and pins being in the position shown in Fig. 8. Crank-lever 23 is then moved outward to the position shown in Fig. 7 and this causes said disks 19 to descend to the position shown in said Fig. 7, and bear firmly upon the sheet of notes and clamp the same between said disks and the peripheries of the collars 4, 5, 6, 7, 8; the crank is then turned, causing the cylinder to revolve and carry the sheet with it, and as the sheet passes under the knives 31, it is cut into the individual notes or bills, and the edges of the two outside bills are also trimmed. At the same time, the signatures are printed upon the bills.

Shortly after the cutting and printing operation, is completed, the crank-lever passes off from the circular cam 23', and spring 25 is allowed to act, and draw rod 21 in the direction indicated by the arrow. This causes the clamps 19 to raise and release the bills, and if there is any tendency to adhere to the cylinder, they are removed therefrom by the guards 45. When it is desired to adjust the collars 4, 5, 7, 8 to cut bills of a slightly different width, a turn of the knob 12 in the desired direction will cause said collars to move longitudinally of the barrel 1, until the desired adjustment is secured, and the springs 36 will cause the cutting-disks 31 to remain firmly in contact with its cooperating edge of the collar, regardless of the direction of adjustment.

It has been found that bills of different denominations vary about one sixteenth of an inch in width, and should it become necessary to make the maximum amount of adjustment which such variation would require, this would necessitate the movement of collars 5 and 7 toward collar 6, to the extent of one sixteenth of an inch, and the movement of collars 4 and 8 in the same directions, to the extent of one eighth of an inch, and this differential movement is provided for in the lead of the threads upon rod 9.

We claim, in a currency-cutting machine, which may or may not be provided with signature-printing equipment, the following:—

1. In a currency cutting machine, the combination with a suitable frame, of a cylinder revolubly mounted in said frame, said cylinder consisting of a barrel, a plurality of collars upon said barrel, a portion of

which are longitudinally and differentially adjustable thereon, for the purpose set forth, means positioned within said barrel, connected to said collars and arranged to adjust the same simultaneously and differentially, means for revolving said cylinder, paper-clamping means carried by said cylinder, consisting of a plurality of radially-movable pins projecting through said collars and provided upon the outer end with a disk adapted to clamp the paper between the same and the periphery of said collars, said pins being spring-held in the inward clamping position, means actuated by said cylinder, revolving-means arranged to automatically move said pins outward to a non-clamping position, and rotary cutters revolvably mounted in said frame, cooperating with and frictionally driven by said collars, for the purpose of severing a sheet of currency into the several bills of which it is composed.

2. In a currency cutting machine, the combination with a suitable frame of a cylinder revolvably mounted in said frame, said cylinder consisting of a barrel, a plurality of collars mounted upon said barrel, all but one of which are longitudinally and differentially adjustable upon said barrel, for the purpose set forth, means positioned within said barrel, connected to said collars, and arranged to adjust the same simultaneously and differentially, a crank arranged to revolve said cylinder, paper-clamping means carried by said cylinder and arranged to be automatically actuated by means connected to said crank, a cutting-disk arranged to cooperate with each of said collars and adapted to be frictionally driven thereby, and means automatically causing each of said disks to conform to the adjustment of its respective collar.

3. In a currency cutting machine, the combination with a suitable frame of a cylinder revolvably mounted in said frame and consisting of a barrel having bearings at either end thereof, within said frame, means for revolving said cylinder, five collars mounted upon said barrel, one of said collars being positioned centrally of said barrel and rigidly affixed thereto, the other of said collars being positioned, two upon either side of said central collar and differentially adjustable toward the same, means positioned within said barrel and arranged to simultaneously effect such adjustment of said adjustable collars, means carried by said cylinder for engaging one edge of a sheet of bank notes, said engaging means being normally spring-held in the engaging position and automatically moved to the non-engaging position by means actuated by said cylinder-revolving means, and means cooperating with said collars, frictionally

driven thereby for severing said sheet into its respective notes.

4. In a currency cutting machine, the combination with a suitable frame, of a cylinder revolvably mounted in said frame, consisting of a barrel having bearings at either end thereof within said frame, five collars mounted upon said barrel, one of said collars being positioned centrally of said barrel and rigidly affixed thereto, said other collars being positioned, two upon either side of said central collar and differentially adjustable toward the same, means positioned within said barrel arranged to simultaneously cause such adjustment of all of said adjustable collars, means for revolving said cylinder, means carried by said cylinder for engaging one edge of a sheet of bank notes, said engaging means being normally spring-held in the engaging position and automatically moved to the non-engaging position by means actuated by said cylinder-revolving means, revolvable disks cooperating with said collars and frictionally driven thereby, for severing said sheet into its respective notes, and means causing the removal of said notes from said collars after the release of same by said engaging means.

5. In a currency cutting machine, the combination with a suitable frame, of a cylinder revolvably mounted in said frame, consisting of a barrel having bearings at either end thereof within said frame, a plurality of collars mounted upon said barrel, one of said collars being positioned centrally of said barrel and rigidly affixed thereto, the others of said collars being positioned upon either side of said central collar and differentially adjustable toward the same, means positioned within said barrel, arranged to simultaneously cause such adjustment of all of said adjustable collars, means for revolving said cylinder, revolvable disks cooperating with said collars and frictionally driven thereby, for severing said sheet into its respective notes, means carried by said cylinder for engaging one edge of a sheet of bank notes and for causing the same to move with said cylinder during said severing operation, means actuated by said cylinder-revolving means for causing the release of said engaging means, at the completion of said severing operation, a table attached to said frame having one edge thereof positioned in proximity to said cylinder, and from which said sheets are fed to said cylinder, means upon said table for preventing the buckling of said sheets as they are carried forward upon said cylinder, and means removing the several notes from said cylinder, after the completion of the severing operation.

6. An element of a currency-cutting machine consisting of the combination of a bar-

rel adapted to be revolubly mounted within the frame of such machine, with collars mounted upon said barrel, a portion of which are longitudinally adjustable thereon, adjusting means positioned within said barrel and connected to said adjustable collars arranged to adjust the same simultaneously, and means operable to actuate said adjusting means.

10 7. An element of a currency cutting machine consisting of the combination of a barrel adapted to be revolubly mounted within the frame of such machine, with collars mounted upon said barrel, a portion of
15 which are longitudinally adjustable thereon, adjusting means positioned within said barrel and connected to said adjustable collars arranged to adjust the same simultaneously and manipulating means positioned
20 exteriorly to said barrel, operable to actuate said adjusting means.

8. As an element of a currency-cutting machine, a cylinder consisting of a barrel adapted to be revolubly mounted within the
25 frame of such machine, collars mounted upon said barrel, a portion of which are longitudinally adjustable thereon, a plurality of spiders positioned within said barrel, each attached to one of said adjustable col-

lars, and adjusting means operably and adjustably connected to said spiders operable to adjust said adjustable collars.

9. In a currency-cutting machine, the combination with a frame, of a cylinder consisting of a barrel revolubly mounted within
35 said frame, collars mounted upon said barrel a portion of which are longitudinally adjustable thereon for the purpose set forth, a spider attached to each of said adjustable
40 collars, means passing through said cylinder operably engaging each of said spiders, and operable to adjust said adjustable collars, means for revolving said cylinder, means actuated by said cylinder-revolving means
45 arranged to clamp one edge of a sheet of bank-notes to the periphery of said cylinder during the severing operation and to automatically release same at the completion of
said operation and means coöperating with
and driven by said collars operating to sever
50 a sheet of bank-notes into its component bills.

LESLIE H. COLBURN.
FREDERICK F. CLARKE.

Witnesses:

WM. B. GRIFFEN,
RAY S. CLARKE.