No. 852,788. PATENTED MAY 7, 1907.

E. ILCH.

MACHINE FOR PRODUCING WATER MARK EFFECTS ON PAPER.

APPLICATION FILED SEPT. 16, 1904.

2 SHEETS—SHEET 1.

Fig. 1

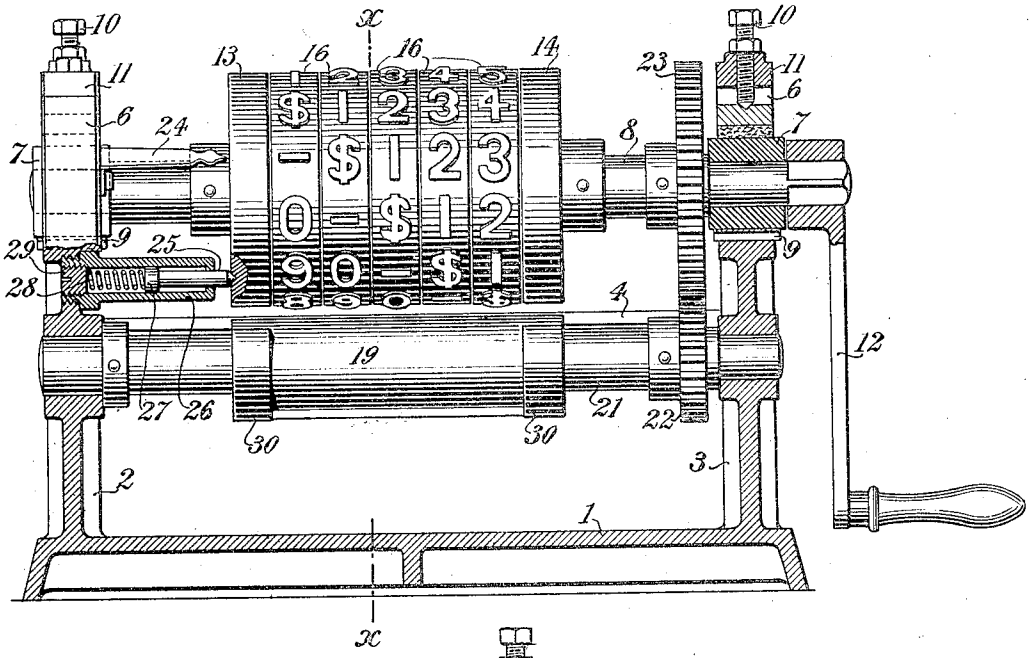
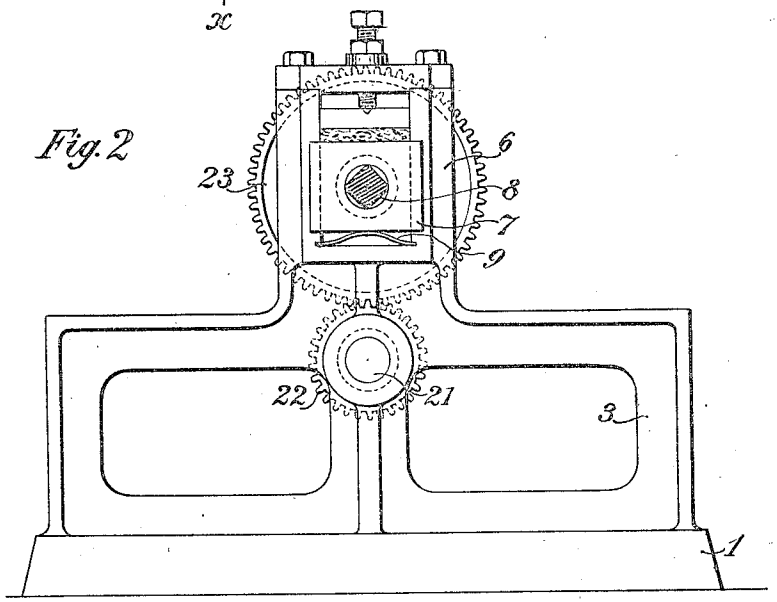


Fig. 2



Witnesses
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by Kerr, Page & Cooper, Attys

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Fig. 3

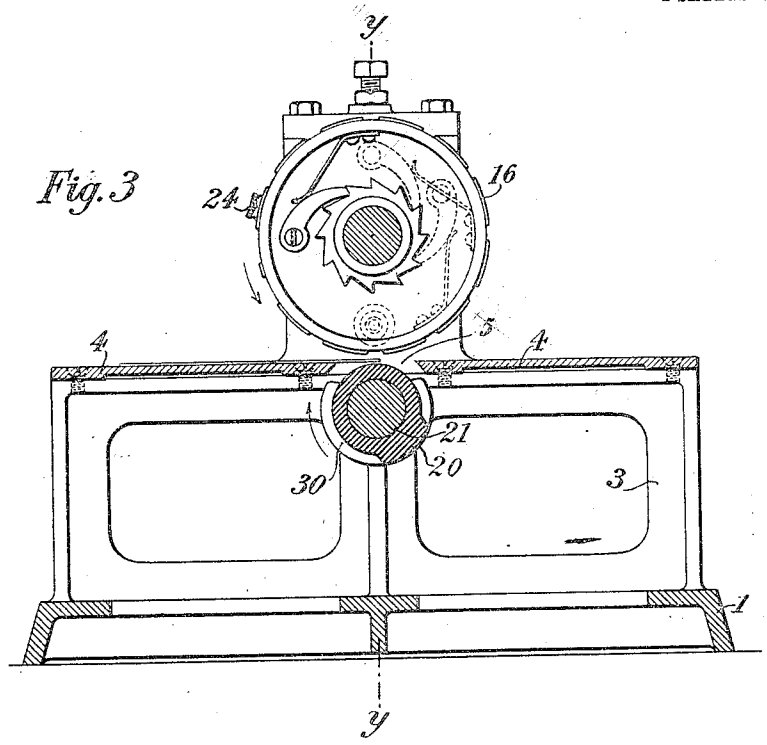


Fig. 4

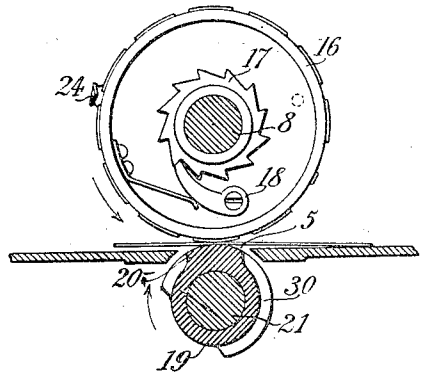
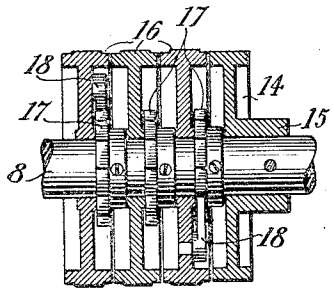


Fig. 5



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UNITED STATES PATENT OFFICE.

EDWARD ILCH, OF NEW YORK, N. Y.

MACHINE FOR PRODUCING WATER-MARK EFFECTS ON PAPER.

No. 852,738. Specification of Letters Patent. Patented May 7, 1907.

Application filed September 16, 1904. Serial No. 224,659.

To all whom it may concern:

Be it known that I, EDWARD ILCH, a citizen of the United States, residing at Elmhurst, in the city of New York, county of Queens, and State of New York, have invented certain new and useful Improvements in Machines for Producing Water-Mark Effects on Paper, of which the following is a specification, reference being had to the drawings accompanying and forming part of the same.

My invention relates to apparatus for protecting bills of exchange, checks, promissory notes, insurance policies, stocks, bonds, bank-notes, and paper or parchment writings of all kinds, by forming thereon by mechanical means characters indicating the value of the paper or the amount for which it is drawn; and the object of the invention is to produce an apparatus highly efficient for this purpose, as well as simple in construction and operation, durable, and of low cost to manufacture.

The gist of my invention resides in the contrivance of an apparatus whereby the desired characters are impressed by means of types or dies upon the thin, hard, dry paper or the like usually employed for commercial purposes, with such great force as to render the paper translucent, the impressions so produced resembling watermarks. The apparatus may be constructed to enable any desired number or amount to be so impressed, to agree with the different face values of individual notes, checks, or other writings. Marks of the kind described cannot be altered or erased, and any attempt to do so leaves unmistakable evidence of tampering. The apparatus is moreover so contrived that a smooth writing surface is left on the paper, so that it may, after having been impressed by my machine, be written over as freely as if the paper were entirely in its original blank condition. In addition, the characters so impressed may be of heroic dimensions, so as to occupy the body of the check or similar paper, and hence to be more or less covered by the written and printed characters thereupon, thus furnishing even greater security, since any attempt to obliterate the translucent characters would necessarily damage the inked characters thereon.

The invention itself consists of the novel features of construction, arrangement of parts, and combinations of elements hereinafter described, and more particularly pointed out in the claims. A convenient embodiment is illustrated in the drawings, in which

Figure 1 is an elevation, partly in section, showing the impression devices and the mechanism for actuating the same. Fig. 2 is a side elevation, at right angles to Fig. 1. Fig. 3 is a section on line x—x, Fig. 1. Fig. 4 is a sectional detail view, showing the operation of the impression devices. Fig. 5 is a section of several of the impression wheels, on a plane corresponding to the line y—y, Fig. 3.

The base of the machine, indicated by 1, is preferably a casting, and is provided with convenient side pieces or standards, as 2, 3, supporting a plate or table 4, the latter being provided with a transverse opening 5, as shown in Fig. 3. In the uprights 6, on the side pieces, are bearings 7, for the shaft 8. The bearings may be of any suitable construction, but are preferably made so as to be adjusted vertically. For such purpose they are, in the embodiment illustrated, fitted to the uprights so as to slide thereon, and are yieldingly supported by springs 9. The adjustment is effected by means of the screws 10, working in the top plates 11, as will be readily understood.

On one end of the shaft is a crank 12, or other means for rotating the same, and on its central part, between the side pieces, the shaft carries a pair of fixed disks, 13, 14, secured thereto by means of hubs, as 15, Fig. 5. Between the disks are the impression wheels, 16, five being shown in the drawing, but obviously a greater or less number may be used, as desired. The impression wheels or die-bearing disks are mounted to rotate on the shaft, but only in the direction contrary to that in which they move in the printing operation. For this purpose there is provided on the shaft a ratchet, as 17, for each, and on the disks are spring-pressed pawls, as 18, engaging the ratchets. From an inspection of Fig. 4 it will be seen that by this construction the disk may be revolved counter clockwise on the shaft, but must turn with the shaft when the latter is rotated in the printing direction indicated by the arrow in Fig. 3. On the periphery of each disk is a series of raised types or dies, as shown, made to withstand heavy pressures. The types or dies represent the numerals, 1 to 0, and each series contains also a dollar sign and a dash.

Journaled in the side pieces 2, 3, below the

die-bearing disks, is a shaft 21, carrying a platen 19 having a raised part 20 extending lengthwise thereof, and about equal, in width circumferentially of the platen, to the height of one of the types or dies on the disks 16. The raised part or impression surface 20, coacts with the types or dies, so that when the two are revolved upon each other the interposed paper will be subjected to great pressure. The dies are thereby impressed on the paper with such force as to leave a translucent impression on the paper, resembling a water mark.

For the purpose of revolving the platen, its shaft is provided with a gear 22 meshing with a gear 23 on the shaft 8, the two gears being so constructed that the disks 16 and platen 19 rotate with the same peripheral speed.

Secured to any suitable part of the machine, as for example to the side piece 2, is a pointer or index 24, so located with reference to the type disks 16 that when the latter are revolved by turning the shaft 8 in the direction of the arrow, Fig. 4, the row of characters opposite the pointer will arrive at the printing opening 5 simultaneously with the raised impression surface 20 on the platen 19. It will therefore be seen that the machine may be set to print any desired combination of the numerals by turning the disks 16 on the shaft one after another until the desired combination is formed in line with the index or pointer. For the purpose of holding the shaft stationary during this manipulation of the die disks, a yielding stop 25 is provided. This is mounted loosely in a tubular carrier 26, and is provided with a head 27 abutting against a coil spring 28, which in turn abuts against the removable closure 29. The other end of the stop is conical in form, and fits into a recess in the disk 13. The shaft 8 is thereby held by the stop with sufficient firmness to prevent its rotating with the type wheels when they are rotated to bring certain characters into the printing line, but the disk 13 is easily and instantly disengaged when the crank 12 is revolved to effect the printing.

For the purpose of seizing the paper and carrying it between the type wheels and the platen, so that the impression will be made near the middle of the check, or note, etc., the platen is provided at its ends with friction devices or ribs 30, which coact with the disks 13, 14, and carry the interposed paper forward as described. These coacting parts may be of such relative diameters that they merely grasp the paper with sufficient firmness to carry it forward, or they may be large enough to bear on the paper with sufficient pressure to produce an impression, in the same manner as the typewheels, which serves to indicate on the paper the termination of the number expressing the denomination or face value thereof, and to prevent "raising" the same by adding additional figures. The ribs and end disks may thus produce translucent bands, one at each end of the row of characters, across the check or other paper; or one or both of the said disks may be provided with a die in the form of an arbitrary character or mark, as shown in Fig. 1, so that the latter will be impressed at the end of the line. In general none will be needed in front of the row, as the dollar mark serves the same purpose there. If no terminal impression is provided for at all by means of the end disks, such impression or numbers of three digits or less may be made by utilizing the dollar mark or the dash on the right hand type wheel or one of the typewheels preceding the latter. It will be noted that in any case the dashes may be used as blanks where the number of digits in the number to be impressed is less than the number of type wheels.

From the foregoing the operation of the device will be readily understood. The shaft 8 being rotated until the recess in the disk 13 engages the stop 25, the type wheels 16 are turned on the shaft until the desired number is formed on the line opposite the index 24. The paper is then placed in position, face down if the types read in their natural order as in Fig. 1, and the shaft 8 rotated, carrying the paper between the disks and the platen. When the impression surface of the latter strikes the paper the index line of characters also reaches the printing position and the types or dies are then pressed upon the paper with enormous force, leaving the paper translucent wherever the dies have touched it. It is essential that the dies on the die wheels be as smooth as possible on their impression surfaces, that is, that they be devoid of projections or other roughness which would have the effect of cutting, embossing or injuring the surface of the paper, in any way, as my invention is not intended to emboss or alter the surface thereof. Its object is to compress the fibers and so produce translucence, resembling somewhat in appearance a grease mark. The impression so formed is absolutely permanent, and any attempt to erase or alter it leaves unmistakable evidence of the attempt. Moreover the paper is not injured, but the surface remains as before, and may be written over in the same way as if the translucent characters had not been impressed.

The apparatus herein shown and described is of course only one embodiment of my invention, which may be embodied in a variety of forms without departure from its proper scope.

What I claim is:

1. In an apparatus for producing watermark-like effects on paper, the combination of a revoluble shaft, one or more die wheels adjustable to bring selected dies to a given

position, a platen having an impression surface, coacting with the die wheels, an index device indicating the position of adjustment of the die wheels relative to the printing position, a yielding stop arranged to hold the shaft in a given position relative to the index and the impression surface on the platen, and means for rotating the shaft against the yielding stop, as set forth.

2. In an apparatus for producing watermark-like effects on paper, the combination of a shaft, one or more die wheels adjustable thereon in one direction only, to bring selected dies to a given position relative to the impression point, means for rotating the shaft in the opposite direction, a revoluble platen having an impression surface to coact with the dies on the die wheels, and actuating devices connecting the platen and the die wheel shaft whereby the impression surface on the platen and the selected dies on the die wheels will reach the impression position simultaneously, as set forth.

3. In an apparatus for producing watermark-like effects on paper, the combination of a revoluble shaft, a pair of disks rigidly mounted thereon, one or more die wheels on the shaft between the disks, said die wheels being adjustable to bring selected dies to a given position, a yielding stop engaging one of the disks to hold the shaft stationary during the adjustment of the die wheels, a platen coacting with the die wheels, and means for rotating the shaft against the stop to bring the selected dies on the die wheels to the impression position, as set forth.

4. In an apparatus for producing watermark-like impressions on paper, the combination of a shaft, a pair of spaced disks rigidly mounted on the shaft, one or more die wheels rotatably mounted on the shaft, means for permitting rotation of the die wheels in only one direction on the shaft, whereby the said die wheels rotate with the shaft in the other direction, a yielding stop engaging one of the disks to hold the shaft yieldingly against rotation, an index or pointer indicating the line of adjustment of the die wheels to bring the desired characters to the impression position, a revoluble platen having an impression surface arranged to reach the impression position simultaneously with the line of characters on the die wheels indicated by the index or pointer, adjustable devices enabling the pressure between the die wheels and the platen to be varied, and means for rotating the die wheel shaft and the platen, as set forth.

5. In a machine for producing watermark-like effects on paper, the combination of one or more revoluble die wheels bearing dies capable of withstanding heavy pressures repeatedly exerted, and having smooth surfaces; a revoluble platen having a raised impression surface the width of which is less than the circumference of the platen and substantially equal to the height of individual dies on the die wheel or wheels, said surface being smooth and incapable of indentation by the dies; said platen and die wheels being arranged in close proximity so as to exert heavy pressure on paper fed between them, whereby the paper under the dies will be highly compressed and translucent characters formed in the paper without injury to the surface thereof; and means for connecting the die wheel or wheels and the platen whereby the impression surface on the latter and the die or dies from which the impression is to be made will coincide at the impression point, as set forth.

6. In a machine for producing watermark-like effects on paper, the combination of a shaft; one or more die wheels adjustable thereon to bring a selected die or dies to a given position relative to the impression point, said dies having smooth surfaces capable of withstanding heavy pressures repeatedly exerted; a co-operating platen having a smooth, rigid, unyielding surface incapable of indentation by the dies, said platen and die wheel or wheels being arranged in close proximity so as to exert heavy pressure on paper fed between them, whereby the paper under the dies will be highly compressed and translucent characters formed in the paper without injury to the surface thereof; and means for holding the die wheel or wheels rigidly on the shaft during the cooperation of the wheel or wheels and the platen to produce the impressions; as set forth.

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Witnesses:
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