A. H. BATES.

PRINTING MECHANISM.

APPLICATION FILED JAN. 2, 1909.

1,021,858.

Patented Apr. 2, 1912.

2 SHEETS—SHEET 1.

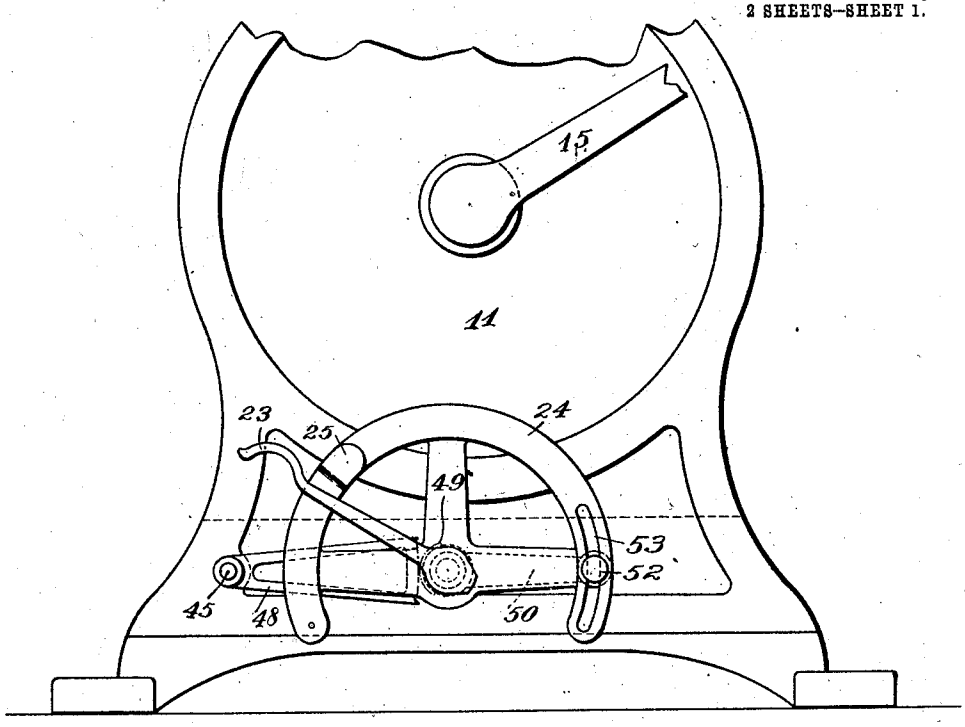

Fig. 1

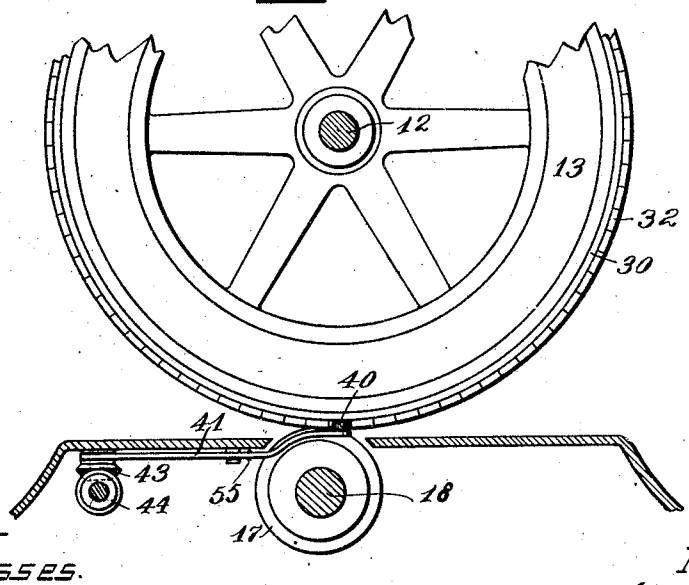

Fig. 2

Witnesses.

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By Baker, Doyle, Mull & Atty's.

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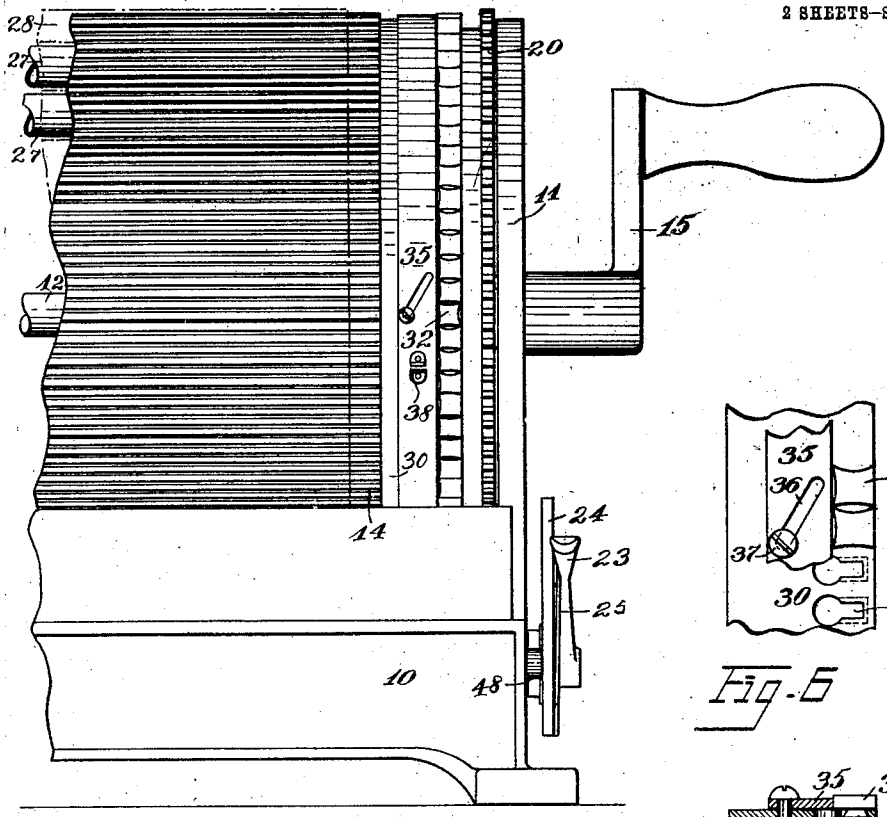

Fig. 3

Fig. 6

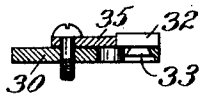

Fig. 7

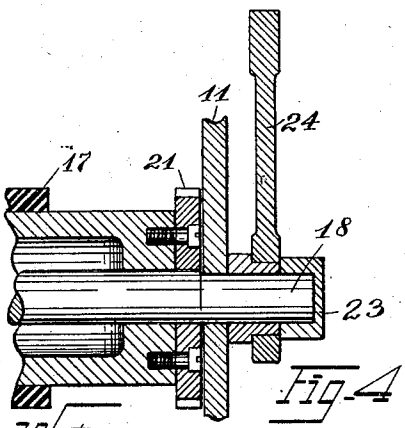

Fig. 4

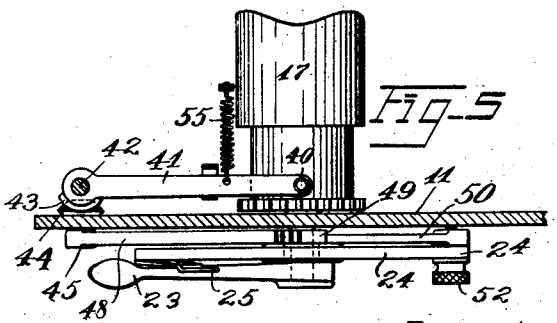

Fig. 5

Witnesses:

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Nathan F. Fretter.

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By Bates, Gould & Hull

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UNITED STATES PATENT OFFICE.

ALBERT H. BATES, OF CLEVELAND, OHIO, ASSIGNOR TO THE AMERICAN MULTIGRAPH COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PRINTING MECHANISM.

1,021,858. Specification of Letters Patent. Patented Apr. 2, 1912.

Application filed January 2, 1909. Serial No. 470,375.

To all whom it may concern:

Be it known that I, ALBERT H. BATES, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Printing Mechanisms, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

In printing machines where there is a rolling impression from one line to another, the pressure on each character in increased for short lines, with the result that such lines appear blacker. This is especially true with machines printing through an inking ribbon, where the pressure is comparatively great and the darkness of the impression is more or less directly proportional to that pressure. In machines of the character of the multigraph, for example, wherein there are lines of individual type carried in longitudinal rows on a rotary drum which cooperates with a rotary platen, this increased impression for short lines is noticeable and becomes more or less troublesome where the machine is producing imitation typewritten work. This inequality of pressure has been remedied in machines wherein the platen surface is coextensive with the printing surface by overlaying or underlaying the platen. It has also been proposed, in stationary flat bed machines, to roll the platen over projections and slightly lift it off the form.

The object of the present invention is to provide a printing machine having a movable type-carrier printing by rolling impression against an unblanketed platen, with means to reduce the pressure for short lines, so that the pressure per unit of area may be maintained substantially constant within allowable limits.

To the above end I have provided means for varying the platen pressure for individual lines of type carried on a movable type-carrier, as a rotary printing drum, the variation in the illustration shown being by four degrees, namely, quarter pressure, half pressure, three quarters pressure, or full pressure. The variation may be still further refined if desired, but I consider this variation sufficient to enable all lines to give a practically uniform impression.

The invention is hereinafter more fully described and its essential characteristics are set out in the claims.

In the drawing, Figure 1 is an end elevation of a portion of a multigraph, or rotary printing machine, to which my invention is applied; Fig. 2 is a vertical section of the same parallel with Fig. 1; Fig. 3 is a partial front elevation; Fig. 4 is a vertical section through the platen shaft; Fig. 5 is a plan above the platen; Fig. 6 is a face view of a portion of my attachment upon the printing drum; Fig. 7 is a transverse section of Fig. 6.

The drawing shows a portion of the machine frame comprising the base 10 and the upright end plate 11. In this plate and in another standard, not shown, is journaled a shaft 12 on which is the printing drum 13, this drum having longitudinal rails 14 adapted to carry individual type in parallel rows, the drum being rotated by suitable means, as, for example, a crank 15 secured on the end of its shaft. Beneath the drum is a suitable platen 17 which is mounted in the end member 11. The printing drum and platen are suitably geared together, as by means of the large gear 20 on the drum and the small gear 21 connected to the end of the platen. The end portion of the shaft 18 which carries the platen is made eccentric, so that by turning this shaft on its axis the platen is adjusted toward and from the printing drum. A suitable handle 23 is provided on the end of the shaft for effecting this adjustment and a suitable arc-shaped plate 24 furnishes means for locking and limiting the movement of the handle, this locking being accomplished by a spring 25 carried by the arc-shaped plate. This much is adjustable so that the pressure may be regulated for different papers or ribbons, while the handle throws the pressure on or entirely off. The type may be inked by a ribbon 28 the ends of which are carried by spools 27 in the drum.

To reduce the pressure for short lines, I provide means on the drum which may be varied according to the lines, and I connect

this means with the arc-shaped plate 24, so that, without interfering with the normal adjustment I am enabled to rock the platen and vary the pressure as desired. This mechanism will now be described.

Secured about the drum I mount a band 30, shown in detail in Fig. 6, which has through it a series of openings 31, each opening having an enlarged and reduced portion, as shown in Fig. 6. Carried on the band by means of these openings are a series of blocks 32, each block having a dovetailed square projection 33 which may hold the block by occupying the reduced portion of the opening 31. These blocks are locked in position by means of the strap 35 which surrounds the stationary band 30 and is movable thereon toward and from the blocks by having an inclined slot 36 in which engages a pin 37 carried by the band 30. Suitable lugs 38 on the strap 35 allow a screwdriver to be inserted between them, for example, to conveniently shift the strap 35 circumferentially, thus moving it toward or from the blocks.

The blocks 32, as shown, have four sides, any of which may be turned toward the crank end of the machine. One of these sides is flat, another is concaved slightly, another is concaved still more, and the final one is concaved greater still. The result is that these blocks may provide an adjustable bearing ring on the drum. Against this ring bears a roller 40 on an arm 41 which is pivoted at 42 and carries a segment of a bevel 43 which meshes with a bevel segment 44 connected on a short shaft 45 in the end member 11. In the outer end of this shaft is a segment 48 which has teeth meshing with a pinion 49 which surrounds the platen shaft 18 and carries an arm 50 adjustably connected with the arc-shaped bar 24. This adjustment is provided by the set screw 52 screwing through a slot 53 in the arc-shaped bar.

From the above described construction it will be apparent that when the flat sides of the blocks 32 are adjacent to the crank end of the drum no variation in the platen pressure takes place as the drum rotates, the mechanism described holding the arcual bar 24 stationary. When, however, a block 32 having a concave surface comes opposite the roller 40, the spring 55 acting on the arm 41 moves that arm to rock the bevel pinions and thereby rock the segment 48 and the arc-shaped bar 24, this rocking being in the direction to decrease the platen pressure.

I have shown the blocks 32 adapted for ordinary double space work, that is, one block for every other type channel provided by the multigraph. If it is desired to use the mechanism for single space work, the result can be conveniently accomplished by duplicating the mechanism shown in Fig. 6, one set of such mechanism being displaced circumferentially for the width of a block from the other one, and blocks of either set operating on the arcual bar 24. By such means the necessity of reducing the blocks to the small size required to present a block for each type channel is avoided, though if desired the blocks could be arranged for each type channel.

Assuming that the machine is using lines in ordinary double space work, it will be seen that there is one block 32 for each. Each line which is full length, or substantially full length, has its block turned with the flat face toward the crank handle. If the length of the line, however, is more nearly three quarters long, the corresponding block 32 is turned with its face of least concavity toward the crank. If the line is approximately half length, the face of middle concavity is used, while if the line is approximately a quarter length, the face of greatest concavity is used. It is very easy to set these blocks, simply slipping back the stop ring 35, shoving the block to the enlargement in the opening 31, turning it around to present the desired face. Fig. 3 shows one of the blocks with its concave face active, the other blocks shown in the figure presenting flat faces. It is to be understood that the total variation in distance between the platen as adjusted for the smallest line and that for the maximum line is very slight, being measured by thousandths of inches, so that the movement required by the roller 40 to effect the desired variation in pressure is not great.

Various changes in my mechanism may be made without departing from the spirit of my invention and I do not wish to be understood as limiting myself to the particular embodiment shown further than the claims and the state of the art require. One of the advantages of substantially this embodiment, however, is its adaptability to the present multigraph, which may be easily varied to accommodate it. The arc-shaped plate 24 instead of being mounted on the end member can be simply made as a spider mounted on the hub of the pinion (as shown) and the normal adjustment can be made by the slot and screw between this spider and the arm 50. Space can be provided on the drum for the blocks and their holding means, and the intermediate mechanism is simple and may be located out of the way.

Having thus described my invention, what I claim is:

1. The combination of a movable member formed with rails to carry individual lines of loosely held type, a rotary impression platen, an eccentric adjustment for such

platen, and mechanism adjustable for different lengths of line to shift such eccentric to change the platen pressure.

2. The combination of a type holding member adapted to carry individual lines of type, a rotary eccentrically mounted platen with mechanism acting for individual lines and adjustable for different lengths thereof to shift such eccentric to change the platen pressure.

3. The combination of a rotary printing member adapted to carry individual lines of type, an impression platen having a surface which is non-coextensive with the printing surface, and multiplying means for varying the pressure on individual lines.

4. The combination of a rotary type carrying drum adapted to carry individual lines of type, a rotary impression platen having a periphery less than that of the drum, and mechanism composed of a set of moving parts for automatically varying the pressure between the drum and platen for varying lengths of line.

5. The combination of a rotary printing drum, a rotary impression platen, an eccentric adjustment for such platen, gearing for swinging such eccentric, a series of blocks carried on the drum adapted to form a variable guide, and a member connecting the gearing with such guide.

6. The combination of a rotary printing drum adapted to carry individual lines, a rotary impression platen, an eccentric mounting for the platen, means for turning the platen in such eccentric mounting to move the platen to idle or active position, and additional means for turning the eccentric mounting to change the platen presentation for individual lines.

7. The combination of a type carrying member, a rotary impression platen, an eccentric mounting for the platen, a lever for turning the mounting to vary the platen pressure, a stop for such lever, said stop being movable, and means mounted on the type carrying member for moving such stop.

8. The combination of a type carrying member adapted to hold parallel lines of type, a series of blocks each having variable faces, said blocks being adapted to be positioned with reference to particular lines, a rotary impression platen, means for pressing the same against the type form, and means for varying such pressure at individual points according to which face of the corresponding block is in active position.

9. The combination of a rotary type holding drum, an impression platen, a band on the drum having a series of openings, blocks having feet engaging such openings, said blocks being shiftable to present varying faces, means for adjusting the platen, and mechanism connected therewith and adapted to engage the face of such blocks as the drum rotates.

10. The combination of a type carrying drum, a band thereon having a series of openings, a series of blocks carried by said openings, a strap engaging the successive blocks to hold them in place, each block having a plurality of faces of varying concavity, an arm carrying a roller adapted to engage the concave edges of such blocks, an impression platen, and means for varying the pressure thereof controlled by said arm.

11. The combination of means adapted to hold a type form of individual lines, a roller impression platen, an eccentric adjustment therefor, and means for automatically changing such adjustment for varying lengths of line.

12. The combination of a printing member adapted to carry a ribbon over the printing surface composed of individual lines, a roller impression platen, and movable mechanism including gearing adapted to change the axis of the platen according to individual lines on the printing member.

13. The combination of a rotary type carrying drum, an inking ribbon carried thereby, a roller impression platen, and an eccentric and gearing for automatically changing the position of the axis of the platen as short lines are presented thereto.

14. The combination of a printing member, a rotary impression platen mounted on a normally stationary axis, and means for turning such axis automatically for short lines.

15. The combination of a rotary type holding drum, a rotary impression platen, means for adjusting the platen by hand, and means for giving it another adjustment dependent upon the lengths of lines of type on the drum.

16. The combination of a rotary type holding drum, a rotary impression platen, a lever for moving the platen to or from active position, and automatic means for moving the platen slightly for short lines.

17. The combination with a movable type carrying member adapted to carry individual lines of type, of a roller impression platen, means for moving the axis of such platen to present the platen to the type carrying member or withdraw it out of engagement therewith, and automatic means for moving the platen a shorter distance according to individual lines on the type carrying member.

18. The combination of a type carrying drum having longitudinal lines of type, a roller impression platen mounted parallel with the drum, means for maintaining pres-

sure between the platen and the drum, and means including movable mechanism mounted off of the drum for automatically relieving such pressure for short lines on the drum.

19. The combination of a rotary drum adapted to hold individual lines, an impression platen, mechanism for changing the presentation of the platen and the drum, means on the drum acting on said mechanism and moving the same at the point of engagement longitudinally of the drum to vary the platen presentation.

20. The combination of a rotary drum adapted to carrying individual lines of type, a rotary coöperative impression platen, eccentrically mounted, and means for automatically swinging such eccentric mounting various amounts during the rotation of the drum, according to the lengths of individual lines.

21. The combination of a rotary type-holding drum, an impression platen, a series of blocks mounted on the drum, mechanism coöperating with said blocks, adapted to be moved thereby various amounts in the direction of the length of the drum, and means moved by said mechanism for adjusting the platen presentation.

22. The combination of a rotary drum adapted to hold individual lines of type, a rotary impression platen, means for throwing the platen into inactive position, movable mechanism for changing the presentation of the platen and drum during the rotation of the drum, and means for operating said movable mechanism various amounts, according to the lines of type on the drum.

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

ALBERT H. BATES.

Witnesses:
CURT B. MUELLER,
BRENNAN B. WEST.