Nov. 21, 1967 P. M. LOWELL ET AL 3,353,480

PRINT WHEEL SETTING CONTROL IN POSTAGE METERS

Filed March 14, 1966 3 Sheets-Sheet 1

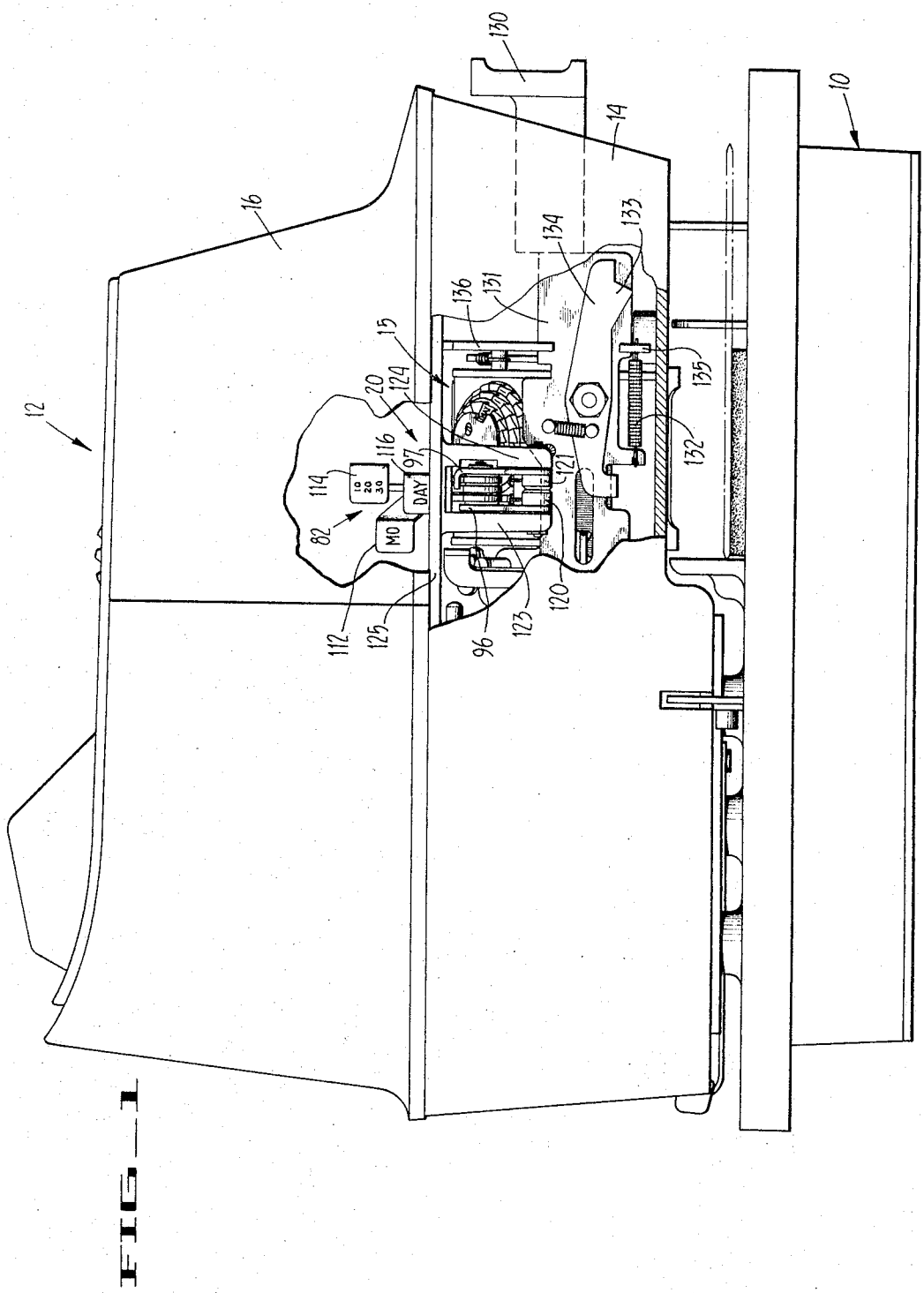


FIG_1

PRINT WHEEL SETTING CONTROL IN POSTAGE METERS

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FIG_2

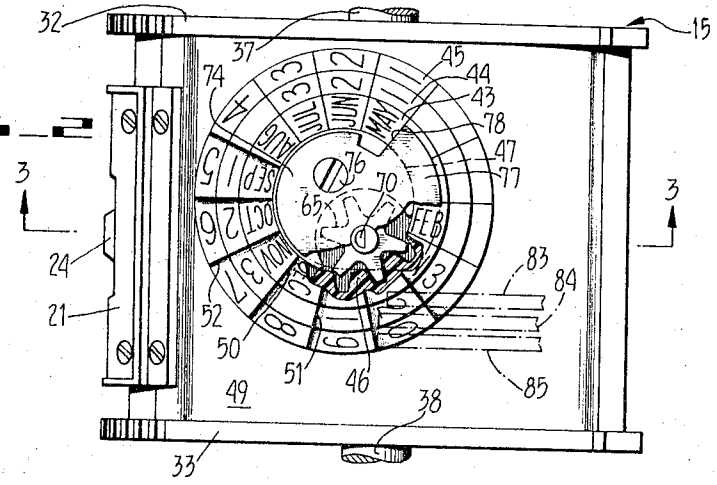


FIG_3

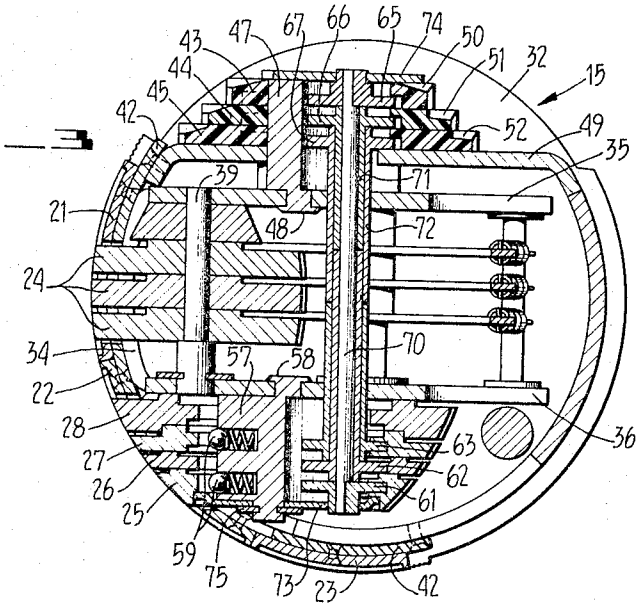
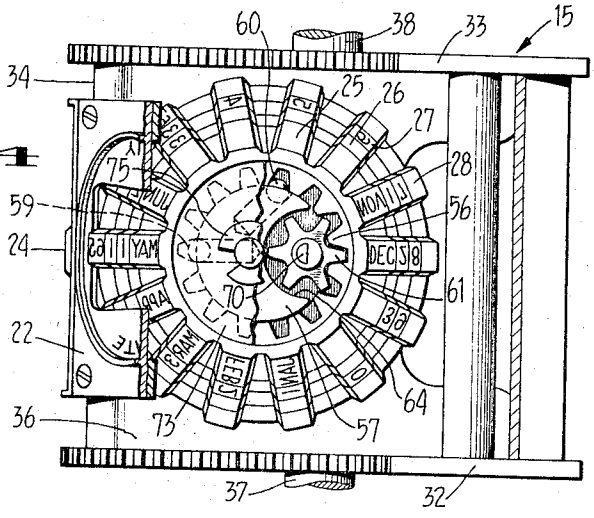


FIG_4



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PRINT WHEEL SETTING CONTROL IN POSTAGE METERS

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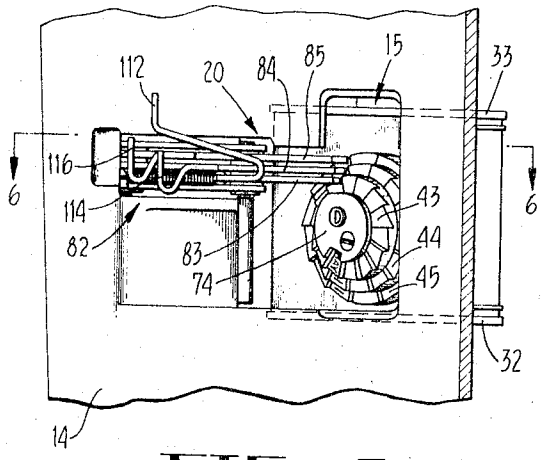


FIG_5

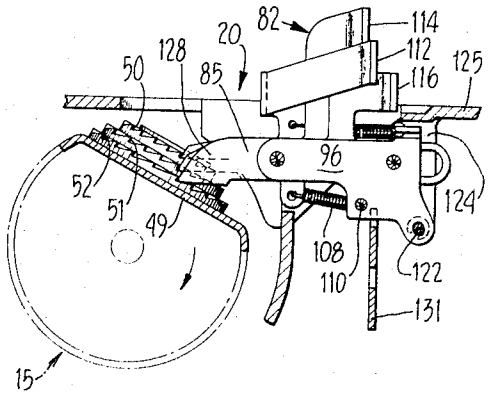


FIG_6

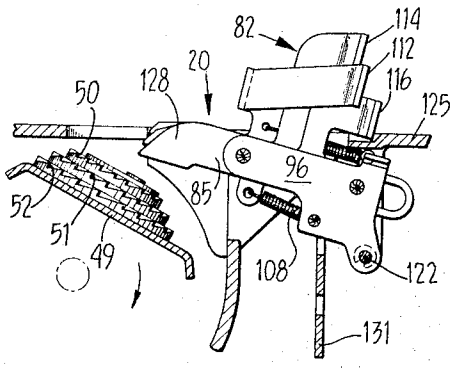


FIG_7

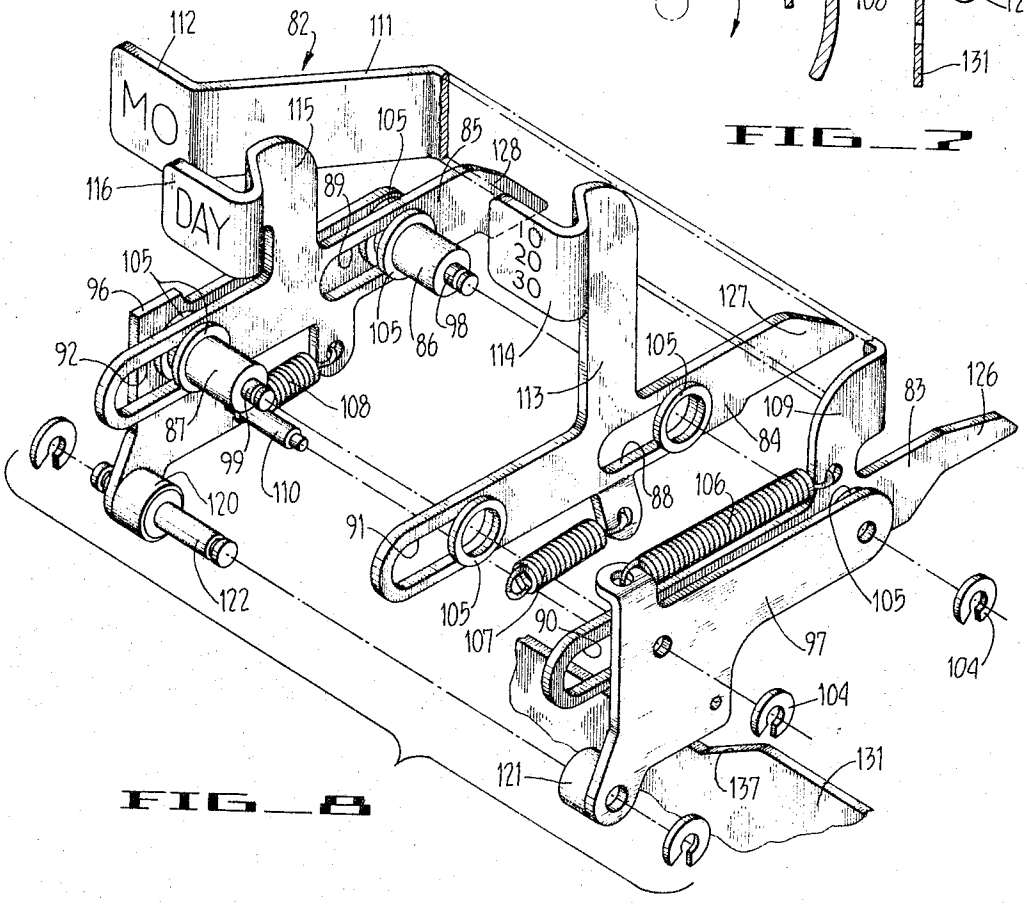


FIG_8

United States Patent Office 3,353,480 Patented Nov. 21, 1967

3,353,480

PRINT WHEEL SETTING CONTROL IN POSTAGE METERS

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4 Claims. (Cl. 101—91)

ABSTRACT OF THE DISCLOSURE

This invention relates to postage metering machines and more particularly to the date printing mechanisms in the postage meter. The date printing mechanism of the postage meter is in the form of type wheels rotatably supported for selective setting within the indicia print drum. For each cycle of postage meter operation, the indicia print drum is rotated one complete revolution within a substantially completely enclosed housing to print the indicia and date. In order to enable such rotation, the date setting mechanism is supported within the meter independently of the print drum and accessible to an operator for adjustment of the date type wheels in the full cycle position of the drum.

Postage meters presently in use utilize a movable printing member, usually a rotatable drum, which carries the postage indicia die, adjustable value printing elements, town circle die and date printing elements. As each piece of mail matter or a tape moves through the machine, a cyclic rotation of the print drum effects the printing of a postmark thereon.

Each of the date printing elements is in the form of a type wheel selectively settable within the rotatable print drum which is enclosed in the cover of the postage meter. In order to prevent the taking of fraudulent postmark impressions without rotation of the print drum, the "at rest," or full cycle, position of the drum is such that the indicia die, value printing elements, town circle and date type wheels are inaccessible. A suitable restricted opening is provided in the base of the postage meter which makes the printing of a postmark possible, upon cyclic rotation of the drum.

Inasmuch as the meter cover is secured to the base and is removable by authorized persons only, it becomes desirable to provide external means for the adjustment of the date print wheels, an adjustment which must be made daily to at least one of the print wheels. It is, therefore, an object of the present invention to provide an improved date setting mechanism for a postage meter wherein the means for adjusting the type wheels may be easily and quickly controlled.

Another object of the invention is to provide an improved date printing mechanism having manually adjustable means for controlling the setting of the date wheels and a readily readable indicator therefor.

Another object of the invention is to provide the date type wheels carried by the rotatable print drum with an improved date setting mechanism disengageable from the date wheels to permit cyclic rotation of the print drum.

Other objects and advantages will appear from the following description of a preferred embodiment as illustrated in the accompanying drawings, in which:

FIG. 1 is an elevational end view of the postage metering device with a portion of the cover broken away to show the date setting mechanism;

FIG. 2 is a view of the print drum showing the date adjusting disks;

FIG. 3 is a sectional transverse axial view of the print drum, the view being taken on the plane indicated by the line 3—3 in FIG. 2;

FIG. 4 is a view of the print drum showing the date type wheels with a portion of the town circle die broken away;

FIG. 5 is a fragmentary plan view of the postage meter showing the date wheel adjusting mechanism;

FIG. 6 is a fragmentary sectional elevational view of the postage meter showing the date setting mechanism engaged with the date wheel adjusting disks, the view being taken on the plane indicated by line 6—6 in FIG. 5;

FIG. 7 is a view similar to FIG. 6 showing the date setting mechanism disengaged from the date wheel adjusting disks; and

FIG. 8 is an enlarged isometric projection of the date setting mechanism in disassembly.

The invention is shown as being embodied in a postage metering machine of the type disclosed in the application of John F. Reus et al., S.N. 486,437, filed Sept. 10, 1965. As illustrated in FIG. 1, the metering machine comprises, generally, the base portion **10** and the demountable meter unit **12**, within the cover **14** of which the print drum **15** is housed. The corner portion **16** of the cover **12** is removable for access to the date setting mechanism **20**. The print drum **15** (FIGS. 2, 3 and 4) carries the usual printing dies, such as indicia die **21**, town circle die **22** and the slogan die **23**. A suitable aperture is provided in the indicia die **21** to accommodate the numeral type wheels **24** for the printing of a selected postage value. An aperture is also provided in the town circle die **22**, within which the month type wheel **25**, tens day type wheel **26**, units day type wheel **27** and year type wheel **28** are disposed for selective setting by the date setting mechanism **20**.

The print drum **15** is of conventional construction comprising circular end frames **32** and **33** of similar diameter maintained in parallel spaced-apart relationship by the substantially U-shaped frame **34**. The legs **35** and **36** of the U-shaped frame **34** are disposed in planes parallel one with the other and are equidistantly spaced from the axes of the print drum supporting shafts **37** and **38**, which are coaxial and are secured, respectively, to end frames **32** and **33** concentric therewith. Each end of the shaft **39**, upon which the numeral type wheels **24** are rotatably mounted, is supported, respectively, in the legs **35** and **36** of the U-shaped frame **34**. Each of the die plates, i.e., the indicia die **21**, town circle die **22** and slogan die **23** is secured on plate **42** curved to conform with the outer arcuate surface of the web portion of the U-shaped frame **34**. Plate **42** is, in turn, secured on the web portion of the U-shaped frame **34** between circular end frames **32** and **33** of print drum **15**.

For each postmark impression, the print drum **15** is rotated through one revolution, coming to rest in the full-cycle position shown in FIGS. 1, 5 and 6. Such an impression may include the printing of the indicia, the postage value, the town circle, the date and the slogan.

The print drum **15** is similar to that shown and described in the aforementioned copending application of Reus et al. and the copending application of Peter M. Lowell, S.N. 492,795 filed Oct. 4, 1965. Included in the print drum **15** is the month type wheel **25**, the tens day type wheel **26**, the units day type wheel **27** and the year type wheel **28** (FIGS. 3 and 4). The type wheels **25** to **28**, inclusive, are progressively larger in diameter, with the type faces of each wheel arcuately formed to conform to the printing curvature of the town circle die **22**. The months of the year are embossed on the peripheral surface of the month type wheel **25**, the numerals "1" to "3" are embossed on the tens day type wheel **26**, while the numerals "1" to "9" and "0" are embossed on the units day type wheel **27**. The last two numerals of

each of fourteen consecutive years are embossed on the peripheral surface of the year type wheel **28**.

The corner panel **16** may be hinged or otherwise removably secured to the cover **14** of the meter. An operator may, upon the removal or opening of the corner panel **16** (FIG. 1), control the day-to-day and month-to-month setting of the type wheels **25**, **26** and **27** by the selective adjustment of the dater selection mechanism **20** (FIG. 1) in the full-cycle position of the print drum **15**. Inasmuch as the year type wheel **28** is to be adjusted but once a year, such adjustment may be made by means of a stylus, upon removal of the meter from the base.

For this purpose, the dater selection mechanism **20** comprises a month selector disk **43**, a tens day selector disk **44**, and a units day selector disk **45** (FIGS. 2 and 3). Each of the selector disks **43**, **44** and **45** is provided with internal gearing of similar pitch diameter, such as that indicated at **46** in FIG. 2. The internal diameter of the selector disks is slightly greater than the diameter of the crescent-shaped pivot block **47**, about which the disks may be rotated. The pivot block **47** is secured on the leg **35** of U-shaped frame member **34** by any suitable means, such as riveting, as indicated at **48** (FIG. 3), and extends upwardly through a circular aperture in the auxiliary disk supporting plate **49** which is secured in position between print drum end frames **32** and **33** in spaced parallel relationship to the leg **35** of U-shaped bracket **34**. The units day disk **45** rests on the outer surface of plate **49**, with the tens day disk **44** and month disk **43** superimposed thereon and concentric therewith. The diameter of disk **44** is smaller than that of disk **45** and disk **43** is progressively smaller in diameter than disk **44**, thereby forming a stepped arrangement. On its peripheral top surface, each of the disks **43**, **44** and **45** is provided with a series of equally spaced ratchet teeth **50**, **51** and **52**, respectively, for a purpose to be hereinafter described.

The type wheels **25**, **26** and **27** (FIGS. 3 and 4) may be individually adjusted by the step-by-step adjustment of the corresponding selector disks **43**, **44** and **45**. To this end, each of the type wheels **25**, **26**, **27** and **28** is provided with internal gear teeth similar to the gear teeth **56** of the type wheel **25** (FIG. 4), the internal gearing for the four type wheels having the same pitch diameter. The inside diameter of the internal gearing of each type wheel, i.e., the distance between the tops of diametrically opposed teeth, is slightly greater than the diameter of the crescent-shaped pivot block **57**, which rotatably supports the type wheels in a stacked relationship. The pivot block **57** is suitably secured on the outer planar surface of the leg **36** of U-shaped bracket **34** by riveting, as indicated at **58** (FIG. 3).

Each of the dater type wheels **25**, **26**, **27** and **28** is resiliently retained in each angularly adjusted position thereof, the month type wheel **25** and the units day type wheel **27** being so retained by similar spring and ball detents **59** radially disposed in pivot block **57** (FIGS. 3 and 4). The tens day type wheel **26** and the year type wheel **28** are each retained in each angularly rotated position thereof by similar spring and ball detents **60** chordally disposed in the pivot block **57** (FIG. 4). To be effective, the ball of each of the detents **59** and **60** engages between two adjacent teeth of the associated type wheel.

In order to control the adjustment of the dater type wheels **25**, **26** and **27** in accordance with the setting of the respective selector disks **43**, **44** and **45**, a series of three similar six-tooth gears **61**, **62** and **63** are provided and are associated with the respective date type wheels having a stacked relationship within the arcuate concave area **64** of the pivot block **57** (FIGS. 3 and 4). Six-tooth gear **61** is enmeshed with the internal gearing of the month type wheel **25**, while gear **62** is enmeshed with the tens day type wheel **26** and gear **63** is enmeshed with the units day type wheel **27**. Similarly, there are three identical six-tooth gears **65**, **66** and **67** associated with the selector disks **43**, **44** and **45**, respectively (FIGS. 2 and 3). The gear **65** is enmeshed with the internal gearing of the month selector disk **43**, gear **66** is enmeshed with the internal gearing of the tens day selector disk **44** and gear **67** with the internal gearing of the units day selector disk **45**. Gear **65**, associated with the month selector disk **43**, is secured on the half-round end portion of one end of a shaft **70** (FIGS. 2 and 3). At its other end, the shaft **70** carries gear **61** secured on the half-round end portion thereof. Shaft **70** extends through, and is rotatably supported in, a quill shaft **71** which, at its one end, carries gear **66** integrally formed thereon and cooperating with tens day selector disk **44**. At its other end, quill shaft **71** carries gear **62** secured thereon and enmeshed with the teeth of the internal gear of tens day type wheel **26**. The quill shaft **71**, in turn, is rotatably supported within a quill shaft **72** which carries six-tooth gear **67** at its one end, integral therewith and enmeshed with units day selector disk **45**. At its other end, quill shaft **72** carries six-tooth gear **63** secured thereon and enmeshed with units day type wheel **27**. Thus, it can be seen that upon angular rotation of selector disks **43**, **44** and **45**, a like rotation is imparted to the corresponding type wheels **25**, **26** and **27**. Quill shaft **72**, serving as a journal for quill shaft **71**, is supported for rotation within axially aligned apertures in legs **35** and **36** of U-shaped bracket **34**. Shaft **70**, quill shafts **71** and **72** and the respective gears carried thereby are retained in the relative position shown in FIG. 3 by means of retainer plates **73** and **74**. Circular end plate **73** may be retained in position on pivot block **57** by any suitable means, such as clip **75**, while end plate **74** is retained in position on pivot block **47** by a screw **76**. The arcual portion **77** of end plate **74** is of a greater radius so that the radial edge **78** thereof forms a reading line for visually determining the setting or adjustment of the selector disks **43**, **44** and **45** and the date to be printed by type wheels **25**, **26** and **27**.

The structural relationship of the selector disks **43**, **44** and **45** with the date type wheels **25**, **26** and **27** is conventional and the description given above is believed to be sufficient for an understanding thereof. However, for a more complete disclosure, reference is to be had to the aforementioned copending application of John F. Reus et al. S.N. 486,437.

In order to selectively adjust the date type wheels to a desired setting, the print drum **15** must be in the normal "at rest," or full-cycle, position shown in FIGS. 1, 5 and 6. In this position of the print drum, the selector disks **43**, **44** and **45** are accessible, upon opening corner panel **16** of meter cover **14**, for selective adjustment by a manually controlled mechanism generally indicated at **82**. Such mechanism comprises three selection bars representative of the month, tens day and units day slidably mounted for reciprocation in a carriage rockable to either an active or inactive position relative to the selector disks **43**, **44** and **45**.

Referring to FIG. 8, the month selection slide **83**, tens day selection slide **84** and units day selection slide **85** are supported for independent endwise reciprocation on a pair of axially parallel rods **86** and **87**, rod **86** engaging in an elongated slot in slide **83** and similar elongated slots **88** and **89** of respective slides **84** and **85**. Similarly, rod **87** is engaged in elongated slots **90**, **91** and **92** of the respective slides **83**, **84** and **85**. Each of the rods **86** and **87** is secured at its one end in a carriage end plate **96**. At its other end, each of the rods **86** and **87** is provided with a reduced diametral end portion **98** and **99**, respectively, engaged in suitable apertures in carriage end plate **97**. Each rod **86** and **87** is retained in position in end plate **97** by means of each of similar clips **104** engaged in suitable annular grooves in the end portions **98** and **99**, the shoulder formed by the reduced end portions **98** and **99** serving to maintain a spaced parallel relationship of the end plates **96** and **97**. Also, each of the selection slides **83** and **85** is maintained by means of similar collars **105** in equally spaced parallel relationship with respective end plates **97** and **96** and the

adjacent selection bar **84**. Normally, each of the selection slides, or pawls, **83**, **84** and **85** is resiliently urged by means of respective springs **106**, **107** and **108** to the leftmost position shown in FIGS. 5 and 8 or the rightmost position shown in FIG. 6. One end of spring **106** is secured in an aperture in the vertically extended portion **109** of selection slide **83** while its other end is secured in an aperture in an ear formed at a right angle to carriage end plate **97**. Similarly, each of springs **107** and **108**, at its one end, is secured in an aperture in a depending lug of the respective selection slides **84** and **85** with the other end of each of the springs **107** and **108** supported on a spacer rod **110** secured at its ends in carriage end plates **96** and **97** and extending axially parallel to rods **86** and **87**.

Each of the selection slides, or pawls, **83**, **84** and **85** is provided with a fingertip control for the manipulation thereof. The vertical extension **109** of the selection slide **83** is formed in a substantial U-shape with one leg **111** extending angularly relative to the plane of the slide **83**, its end portion **112** extending laterally in a plane at a right angle to the selection bar and bearing the designation "MO" for month. Similarly, a vertical extension **113** of the tens day selection bar or slide **84** carries, at its upper end, a V-shaped form, one leg **114** of which lies in a plane transversely of the slide **84** and bears the designations "10," "20" and "30" for the tens day selection. Likewise, the units day selection slide **85** carries a vertical extension **115**, the upper portion of which is formed in a substantial V-shape with the lateral extension **116** thereof lying in a plane transversely of the slide **85** and bearing the designation "DAY." The faces of the extensions **114**, **116** and the end portion **112** of the slides **84**, **85** and **83**, respectively, bearing the various designations, lie in planes parallel one with the others.

Each of the carriage end plates **96** and **97** carries a bushing **120**, **121**, respectively, secured thereon and positioned in coaxial relationship to pivotally support the plates **96** and **97** on a shaft **122** supported at its ends in depending brackets **123** and **124** (FIG. 1) integrally formed on an internal projection **125** of meter cover **14**. With the rocking of the carriage **96**, **97**, the tip of the end portions **126**, **127** and **128** of the respective pawls **83**, **84** and **85** are moved into or out of active engagement with the ratchet teeth **50**, **51** and **52** of the respective selector disks **43**, **44** and **45**, as viewed in FIGS. 6 and 7.

It will be noted that there is an equal number of radially disposed ratchet teeth **50**, **51** and **52**, i.e., they are equiangularly spaced on the respective selector disks **43**, **44** and **45**. Normally, the extent of movement that would be required of selection slide **83** to effect a step-by-step movement of the corresponding selector disk **43** is less than that required of selection slide **84** for a step-by-step movement of selector disk **44**. The extent of movement that would normally be required of the selection slide **84** is, in turn, less than that of selection slide **85** to impart a similar angular rotation to selector disk **45**. It becomes apparent that if the nose or tip of each of the selection slides **83**, **84** and **85** were engaged with a tooth of the corresponding selector disk **43**, **44** and **45**, the extent of movement that would be required of selection slide **83** to effect a step-by-step movement of the corresponding selector disk **43** is less than that required of selection slide **84** for a step-by-step movement of selector disk **44**. In order for the extent of movement of the selection slides **83**, **84** and **85** to be equal and for an equiangular rotation of the corresponding selector disks to be effected thereby, each of slides **84** and **85** is of equal length, as seen in phantom line in FIG. 2, while slide **83** is of a shorter length. Thus, there is provided sufficient lost motion between slide **83** and an associated tooth **50** and between slide **84** and an associated tooth **51** to effect a like angular rotation of each of the disks **43**, **44** and **45** with each manipulation of the respective slides **83**, **84** and **85**.

In the full-cycle position of the print drum **15** (FIG. 6), it can readily be seen that an actuation of one or more of the selection slides **83**, **84** or **85** will effect a single equiangular rotation of the respective selector disks **43**, **44** or **45**. Immediately following the actuation of each slide **83**, **84** or **85**, the associated spring **106**, **107** or **108** causes a retraction of the slide to its inactive position for a succeeding step of rotational movement of the corresponding selector disk.

For a cycle of rotation of print drum **15**, the conventional manual control button **130** (FIG. 1) carried by control slide **131** is moved to the left, against the urgency of the spring **132**, to a position wherein the tooth **133** of locking lever **134** engages the extended portion **135** of the postage meter frame **136** to retain the control slide **131** in its actuated position. Immediately upon movement of the control slide **131** to the left (FIGS. 1 and 8), the inclined surface **137** of the slide **131** engages the lower edge of carriage end plate **97**, camming the end plates **96** and **97** counterclockwise as seen in FIG. 8, or clockwise as seen in FIG. 6, to rock the selection slides **83**, **84** and **85** out of active engagement with the corresponding selector disks **43**, **44** and **45**, as seen in FIG. 7, whereupon the slide **131** operates in a conventional manner to initiate a clockwise cyclic rotation of print drum **15**. At the conclusion of each cycle of rotation of print drum **15**, means (not shown) become effective to impart a counterclockwise rotation to locking lever **134** (FIG. 1) to release the latch tooth **133** from its engagement with the extended frame member **135**. Spring **132** then becomes effective immediately to restore control slide **131** and control button **130** to the inactive position shown in FIG. 1. Upon return of control slide **131** to its inactive position, the pawls **83**, **84** and **85** again drop into active engagement with the respective selector disks **43**, **44** and **45**.

What is claimed is:

1. In a postage meter,

a frame,

an indicia print drum including value type wheels mounted in said frame and cyclically rotatable from a normal full-cycle position,

a series of date type wheels mounted in said print drum and independently adjustable to each of a plurality of angular positions to effect printing of a date upon each rotation of said drum,

means associated with each of said date type wheels for controlling the adjustment thereof,

a manually operable setting means normally engaged with said associated means to selectively control the angular adjustment of each of said date type wheels and disengageable therefrom to enable cyclic rotation of said print drum, and

a manipulative member operable to disengage said setting means from said associated means and to effect cyclic operation of said print drum.

2. In a device of the character described in claim **1**, wherein said associated means comprises,

a plurality of ratchet wheels mounted on said print drum, one for each of said date type wheels normally operable to effect angular rotation thereof by the engagement therewith of said manually operable setting means.

3. In a device of the character described in claim **2**, wherein said manually operable setting means comprises,

a carriage mounted in said frame rockable by said manipulative member from a normally operative to an inoperative position relative to said ratchet wheels, and

a series of setting members carried by said carriage for sliding movement therein, each of said members being effective upon sliding movement and in the operative position of said carriage to engage a tooth of the corresponding ratchet wheel thereby imparting a predetermined angular rotation to the corresponding date type wheel.

4. In a postage meter,

a frame,

a printing drum mounted in said frame for cyclic rotation from a full-cycle position,

a series of date type wheels mounted for angular rotation within said print drum, said type wheels being independently adjustable to represent a date to be printed upon cyclic rotation of said print drum,

a detent means for resiliently retaining each of said type wheels in each adjusted position thereof,

a plurality of ratchet wheels, one for each of said type wheels carried by said print drum and operable upon each angular rotation thereof to impart a like rotation to the corresponding type wheel,

a carriage supported in said frame rockable from a normally operative to an inoperative position,

a series of setting pawls including date indicating devices mounted for reciprocable movement from a normally inactive to an active position in said carriage, one end of each of said pawls engaging a tooth of the corresponding ratchet wheel in each angularly

rotated position thereof and in the operative position of said carriage,

means for resiliently maintaining each of said setting pawls in the inactive position, and

a control member operable upon depression thereof to rock said carriage to its inoperative position and to initiate a cyclic operation of said printing drum.

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WILLIAM B. PENN, *Primary Examiner.*