March 19, 1940. L. CHERRY 2,194,382

LOG WRITING MACHINE

Filed Nov. 14, 1936 4 Sheets-Sheet 1

Fig. 1

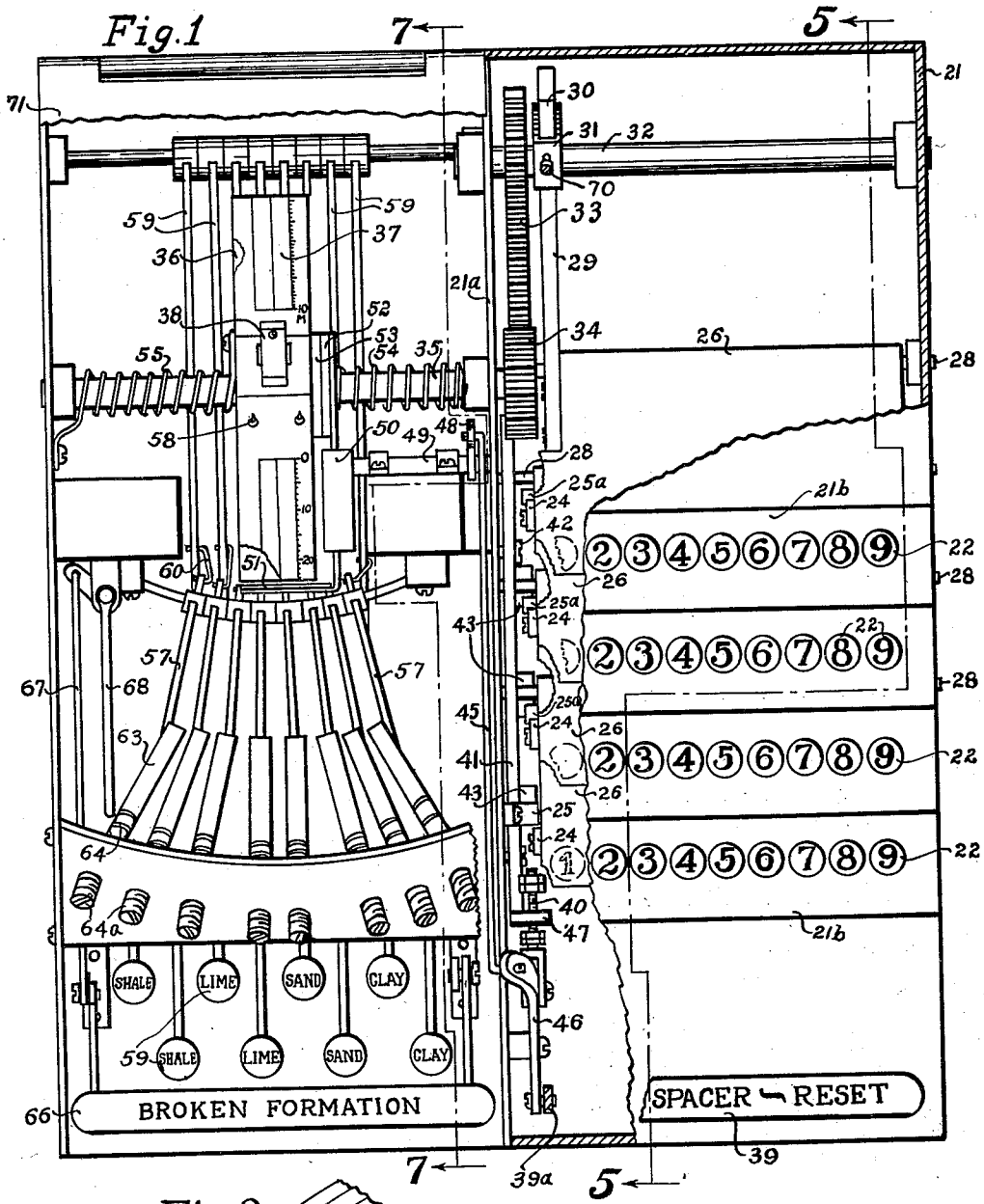
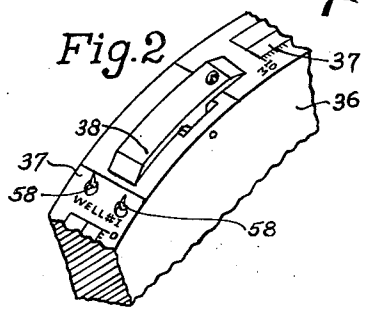


Fig. 2



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LOG WRITING MACHINE

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Fig. 3

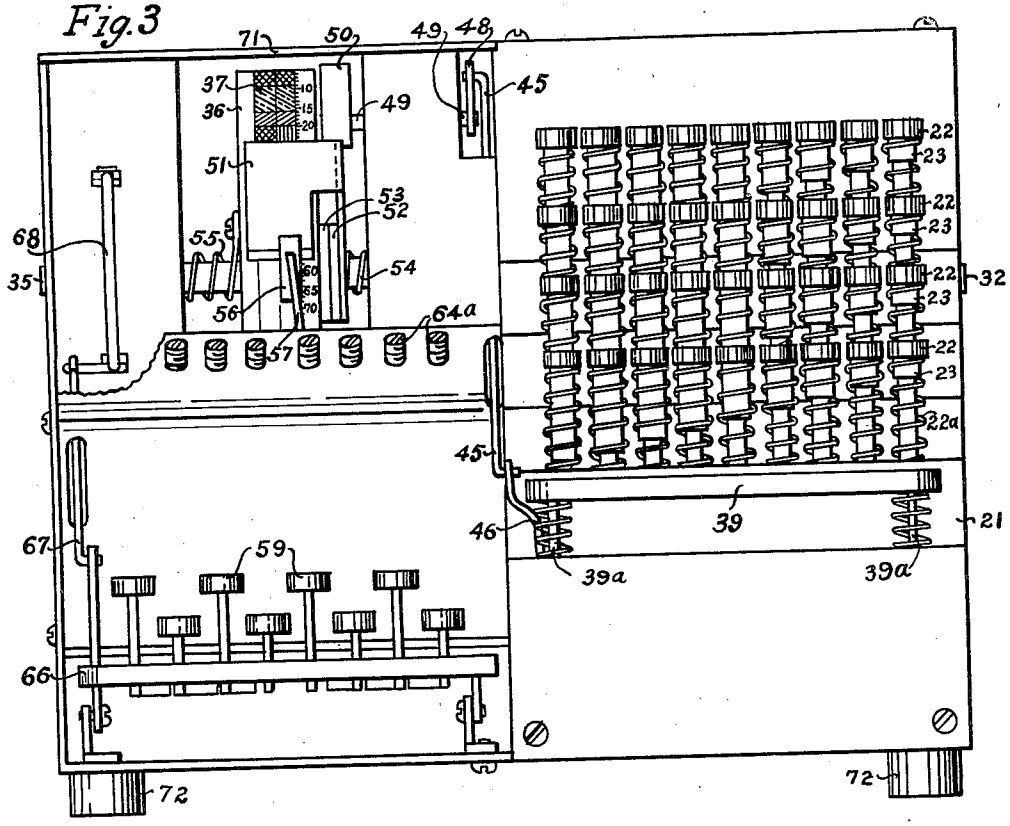
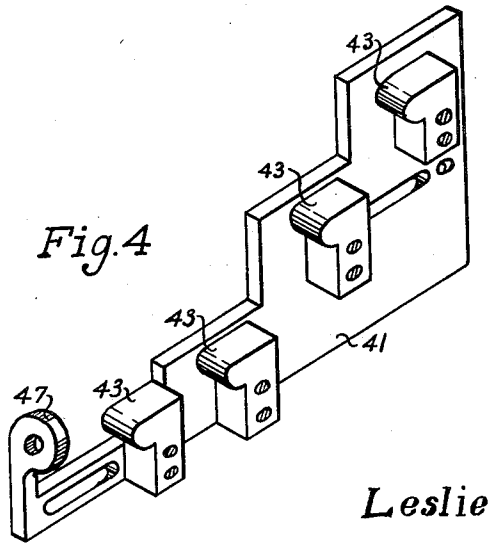


Fig. 4



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LOG WRITING MACHINE

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Fig. 5

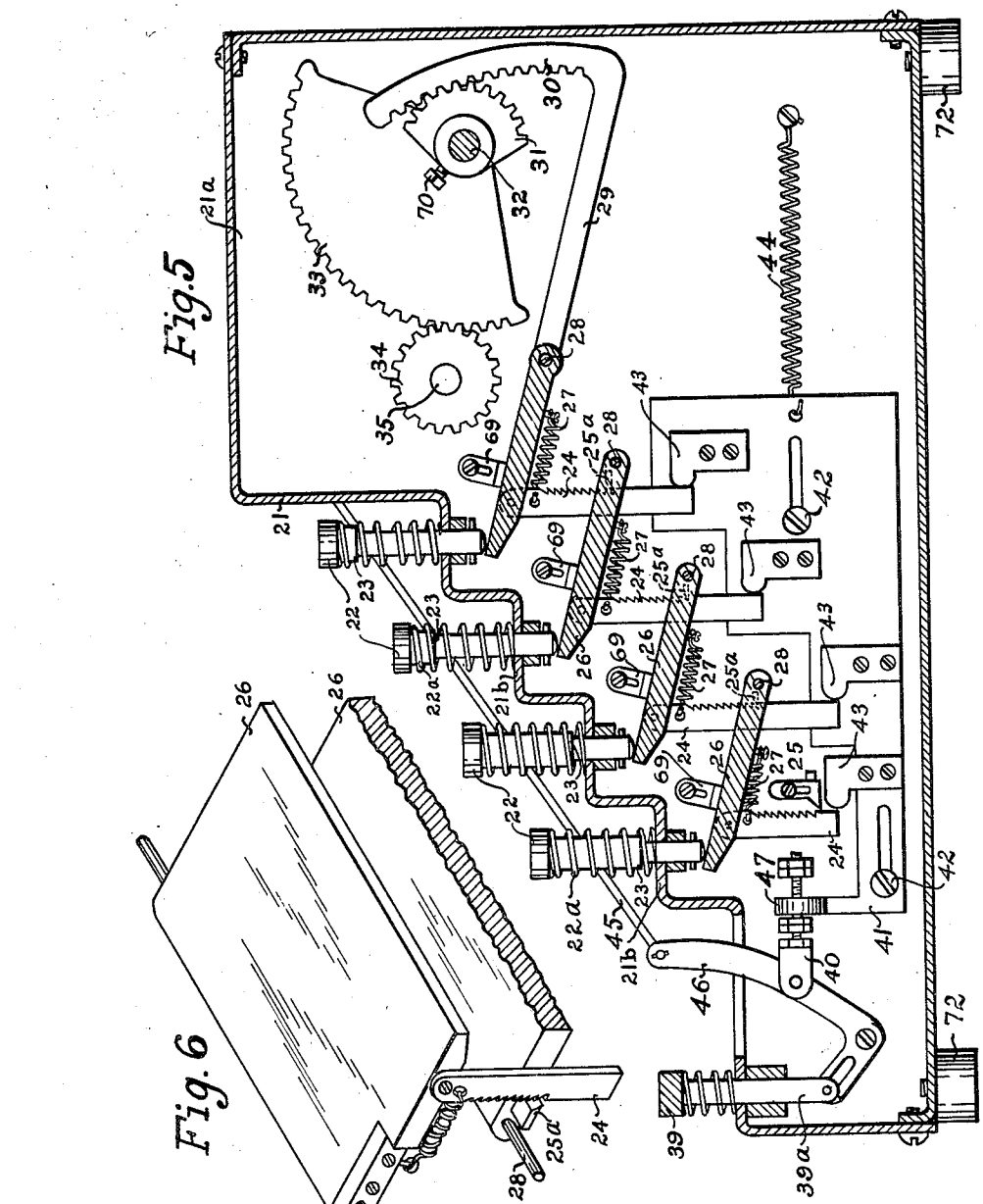


Fig. 6

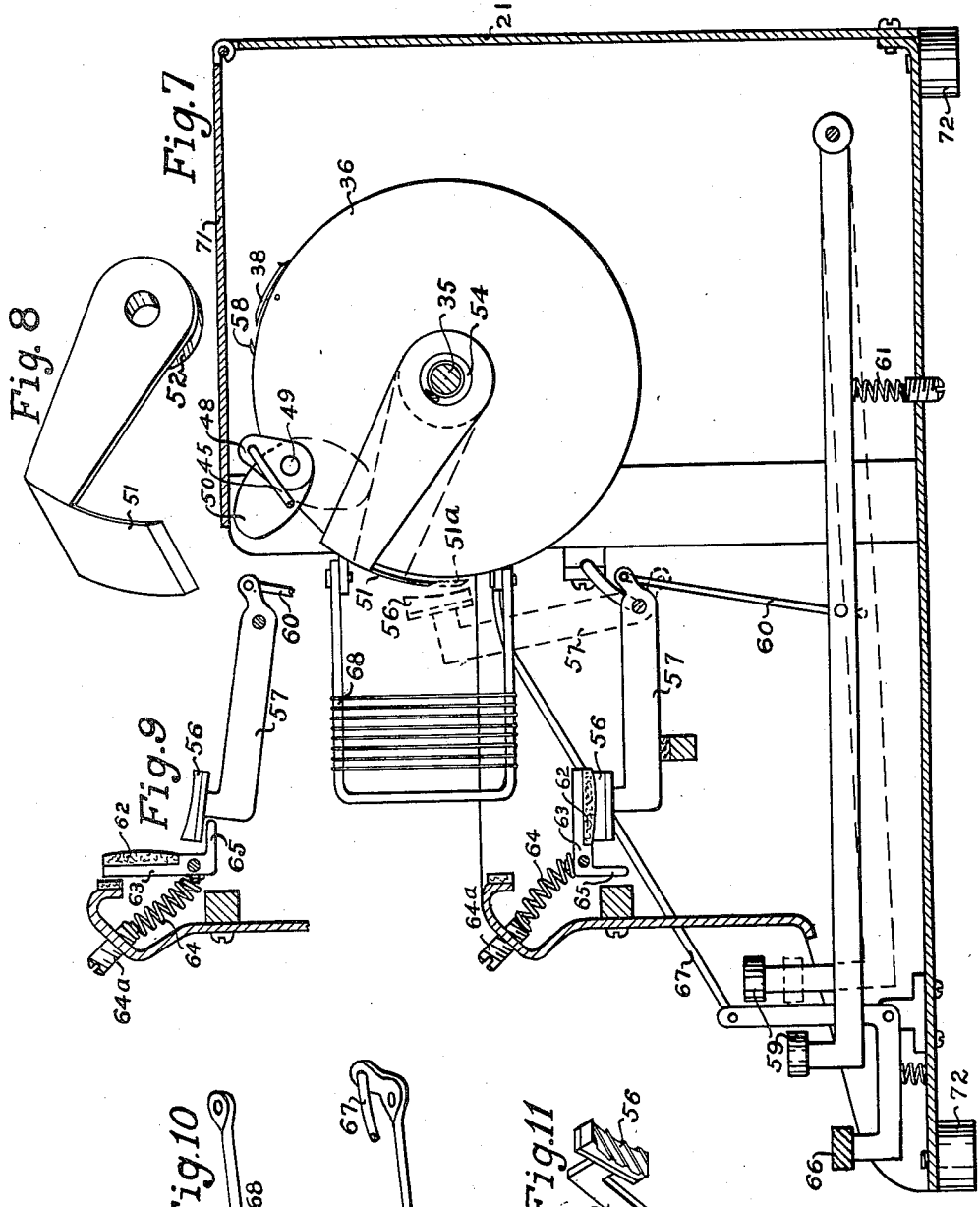
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LOG WRITING MACHINE

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2,194,382

UNITED STATES PATENT OFFICE

2,194,382

LOG WRITING MACHINE

Leslie Cherry, Wichita Falls, Tex.

Application November 14, 1936, Serial No. 110,921

19 Claims. (Cl. 197—1)

This invention appertains to improvements in log writing or graphing machines. The machine is designed to graph colored or symbolized logs on a straight graph at predetermined intervals so as to illustrate graphically various materials, strata and the like, as may come within the adaptation of the machine.

The primary object of this invention is to provide a machine that will record both color and character symbols in such manner that statistics may be comparatively graphed on a linear record.

Another object of the invention is to provide a machine that will locate mechanically a point on a record strip placed upon a drum and imprint thereon a character or color symbol or a combination of the two for a determined distance.

Another object of this invention is to provide a machine that has numeral keys that coordinate with a rotatable drum so as to bring the desired point into register with an imprinting mechanism.

Yet another object of this invention is to provide a mechanism that will imprint a variety of colors upon a log record strip.

Still another object of this invention is to provide a spacing and resetting mechanism so as to permit each successive color or symbol to be joined on the record to the preceding color or symbol without a break.

A still further object of this invention is to provide a grilled shield that may be printed therethrough for the purpose of indicating certain desired effects.

Another object of this invention is to provide independent inking means for each printing face.

A further object of this invention is to provide a shield that may be reset to cover the exact amount of color imprinted so as to prevent overlapping with the succeeding imprint.

While, for the purpose of simplicity and clarity in describing the mechanism and function of this machine, a specific use is described, it is to be understood that the machine is adaptable to many industrial and commercial fields and it is not to be construed that the use of the invention is to be limited to any particular field. For the purpose aforesaid, the machine is described for use in graphing geological strata and formations, it may be used with equal efficacy in graphing logs of imports and exports of various commodities, population, data for various races and countries, for graphing production of agricultural commodities for comparison as to locality and kinds. The above suggestions make it apparent that the use of the machine is applicable to practically every kind of graphic comparison utilizing statistics.

With the foregoing objects in view together with others that will become apparent as the description proceeds, reference is to be had to the drawings which illustrate a preferred embodiment of the invention, but it is to be understood that in adapting same to meet specific needs and requirements, the design may be varied and changes in the minor details of construction resorted to within the scope of the invention as claimed without departing from the spirit thereof.

In the drawings:

Figure 1 is a plan view of the invention with parts of the frame or housing broken away to show construction of the interior;

Figure 2 is a detail perspective view of a portion of the drum, showing a log strip or record holding clip;

Figure 3 is a front elevation of the machine;

Figure 4 is a perspective view of the accumulative release mechanism detached;

Figure 5 is a longitudinal section, taken on the line 5—5 of Figure 1;

Figure 6 is a detail perspective view of accumulative actuating plates detached and apart from coacting mechanism;

Figure 7 is a longitudinal section, taken on the line 7—7 of Figure 1;

Figure 8 is a detail perspective view of the gauge shield detached;

Figure 9 is a fragmentary detail sectional view of the inking and printing mechanism apart from the rest of the machine;

Figure 10 is a detail perspective view of the grilled shield;

Figure 11 is a detail perspective view of a printing bar and face having symbols thereon.

For a full understanding of the invention and the merits thereof reference is to be had to the following description and to the drawings in which like reference characters designate like parts in the several views.

The numeral 21 designates the frame or housing of the machine which encloses an accumulator mechanism and an imprinting mechanism. The housing 21 preferably is mounted on resilient feet 72. The housing 21 is divided into accumulator and printing compartments by a wall 21a.

The accumulator mechanism has tiers 21b with index keys 22 slidably mounted therein, to accumulate and index spaces by unit divisions, each tier having the keys thereon numbered from one to nine respectively. The machine as shown em-

bodies four tiers of index keys which gives the maximum of 9,999 units of indexing capacity, however, by slight alteration or addition of similar mechanism, the machine can be made to any desired capacity. The index keys **22** are normally pressed upward by springs **22***a* thereon and are provided with stops **23** that vary in normal spacing from tier **21***b*, according to the respective keys, along each tier, as shown in Fig. 3, that is, a stop for a key carrying the numeral one allows the key to be depressed sufficiently to permit coacting pawls **25** and **25***a* to engage one notch in accumulator racks **24**; likewise keys carrying the numeral nine, for instance, may be depressed nine times as far as keys carrying the numeral one, so that the racks **24** will permit the pawls to engage the ninth notches in the racks **24**.

The index keys **22** engage and bear against the upper sides of accumulative actuating plates **26** which are pivoted on rods **28** extending transversely in the housing **21**, which permits an arcuate movement of the plates **26** and pawls **25***a* carried thereby upon depression of a key. Each accumulative actuating plate **26** has a rack **24** pivotally suspended from an end thereof, and it also has a pawl **25***a* fixed near the pivot rod **28** in position to engage the rack of the next superposed plate **26**. The pawl **25** is adjustably fixed to wall **21***a* of the housing for accurate adjustment to less than one unit, as shown in Fig. 5. Each accumulative actuating plate **26** extends the width of each bank of keys and has a coacting spring **27** that is attached at one end to the accumulative actuating plate **26** and at the other end to the accumulative rack **24** to keep the rack in engagement with the respective pawl **25** or **25***a*. Adjustable stops **69** are provided above the accumulative actuating plates **26** to limit the upward movement thereof.

Upon depressing index keys **22** on the various tiers of keys, the various accumulative actuating plates **26** are depressed. The uppermost index key **22** will move only the uppermost plate **26**, but the lowermost key or any intermediate key will move all of the plates above it, through the racks and pawls. Coacting accumulative racks **24** move with the plates and engage pawls **25** and **25***a* to hold the accumulative plates to which said racks are attached, against upward movement until the racks are released by the pawls. A ratio of 1 to 9 exists between the accumulative racks and accumulative actuating plates in the form of the invention as shown; however, other ratios may be used when desired to meet specific needs. In the case of graphing oil field logs, the last accumulative rack and the coacting accumulative actuating plate would bear the same ratio as to the tier of keys having the highest numerical order. That is, if a log to be graphed was for a well not to exceed 4,999 feet instead of for a well not to exceed 9,999 feet, the upper rack **24** would carry five notches instead of ten, and the ratio of the accumulative actuating plate pivot to the pawl would be a ratio of 1 to 4 instead of 1 to 9.

Upon depressing an index key on the lower tier of keys it will act proportionately, through the rack and pawl connections to the other accumulative actuating plates to pull all accumulative actuating plates down a proportionate amount. The top accumulative actuating plate is moved downward in proportion to the depression of the various index keys thereof.

The uppermost plate **26** carries an arm **29** having a rack segment **30** formed thereon for transmitting the motion from the keys and plates. Rack segment **30** meshes with a gear segment **31** which is fixed by a set screw **10** to a shaft **32**, extending transversely in one side of the housing **21**. A gear segment **33** of the desired ratio is also attached to the shaft **32** and meshes with a pinion **34** which is secured to a shaft **35** extending transversely in the other side of the housing **21**.

A totalizing drum **36** is secured on the shaft **35** and is rotated by the shafts **32** and **35**, and the gearing **30—31** and **33—34**, an amount corresponding with the depression of the respective index keys. The set screw **10** permits adjustment of the gearing to coordinate the drum with the index keys **22**. A suitably divided calibrated log or record strip **37** is detachably secured to the drum **36** as by hooks **58** at one end and by a clip **38** at the other (Fig. 2). A cover **71** hinged to this part of the housing permits access to the interior thereof for removal or replacement of a record strip on the drum **36**. A torsion spring **55** has one end attached to a side of the drum **36** and the other end attached to a side wall of the housing **21** in a relation to return the drum to its initial position upon release of the racks **24** by the pawls.

A spacer-reset bar **39** (Figs. 1 and 5) is used to set the machine in zero position by the complete depression thereof. The bar **39** is spring supported on prongs **39***a* slidable in the housing **21**, and the lower end of one of these prongs **39***a* has a pin and slot connection with a lever **46** (Fig. 5). A slidable linkage **40** is attached to the lever **46** and forms a lost-motion connection between spacer-reset bar **39** and an accumulator rack-release-plate **41** which is slidably mounted upon screws **42** on the wall **21***a* of the housing **21**. Accumulator rack-release-elements **43** are attached to plate **41** in positions to engage the lower ends of racks **24** upon forward movement of the plate **41**, to cause the disengagement of the racks **24** from pawls **25** and **25***a*. A spring **44** acts on the plate **41** normally to hold the accumulator release elements out of engagement with accumulative racks **24**.

A rod **45** is connected also with the lever **46**, and extends therefrom to a lever **48** which is attached to a shaft **49** (see Fig. 7), on which shaft **49**, cam **50** is secured.

A spacer shield **51**, has a hub **52** movably mounted upon the shaft **35** (Fig. 1), and is held in frictional engagement with a corresponding hub **53** of the drum **36** by a compression spring **54** sleeved upon the shaft **35**. Upon normal turning of the drum **36**, as by means of the index mechanism above described, the shield **51** will remain in constant relation to the drum due to the frictional engagement between the hubs **52** and **53**. After a printing operation, which is always at the same point with respect to the drum, the initial depression of spacer-reset bar **39**, causes the cam **50** to move spacer shield **51** into the position indicated by dotted lines at **51***a* in Fig. 7, in which position this spacer shield **51** exactly covers the previously printed color on the record strip **37** until the drum **36** is advanced the length of the printing face, but the shield **51** moves one step with the drum, until depressed again by the cam **50**. This movement of the cam **50** takes effect through the initial movement of bar **39**; further movement of the spacer-reset bar **39** will cause loose linkage **40** (Fig. 5) to engage the lug **47** on the accumulator rack-release-mechanism **41** to release the racks **24** and permitting the spring **55** to turn the drum back to zero position, ready for the succeeding indexing by keys **22**.

The drum **36** has a normal tendency, under torsional tension of the spring **55** to return to a

zero position if not restrained by the engagement of the accumulative racks 24 with the pawls 25, 25a. Therefore, a constant tension is held by the spring 55 on the accumulator index mechanism and by the slightest movement of any of the index keys 22 the movement is transmitted, without loss of motion, to the drum 36 which rotates a corresponding amount. The drum 36 rotates the number of spaces that correspond with the number on the depressed keys, thus placing the drum in position for imprinting of a character or color symbol from a selected printing face 56 (Figs. 7, 11) on the calibrated record strip 37. There are a plurality of printing faces 56, one or more for each symbol or color to be printed. The printing faces 56 may be of any suitable material, such as rubber or metal, as the nature of the work demands. These printing faces are affixed to type bars 57 pivoted in the housing 21, so that upon contact with the drum 36 the selected printing face will be in vertical alignment with the record strip 37 that is attached to the drum 36. The type bars 57 are actuated by keys 59 which are connected therewith by connecting links 60. Springs 61 normally hold the keys 59 upwardly tending to cause type bars 57 to remain in horizontal positions. An individual inking pad 62 is provided for each printing face 56 and is mounted upon a pivoted angular member 63 that has a coacting spring 64 bearing against the angular member 63 in such position as to tend to hold the inking pad either firmly on the printing face in a horizontal position or in a vertical position away from the printing face. which movement is accomplished by the shifting of the spring 64 from one side to the other of the pivoted center by the swinging movement of the angular member 63. Set screws 64a adjust the tension of the springs 64. The normal upward swinging movement of a type bar 57 causes the inking pad 62 to move to the position shown in Figure 9 and upon return of type bar 57, a trigger finger 65 trips the inking device to the position shown in Figure 7. In this manner each printing face is individually inked with the desired color upon each stroke of the respective key 59.

In certain types of graphing, such as graphing broken formations on geological graphs, it is desirable to imprint symbols or colors through a grill or screen to obtain specific effects. This may be accomplished by depressing a bar 66 (Figs. 1 and 7) that is connected through a rod 67 with a grilled shield 68 pivotally mounted in the housing 21 beside the drum 36. This movement will cause the grilled shield to swing into position between the drum and the respective printing face. The grilling on this shield is made of very fine wire or other suitable material such as will not impair printing on the record strip and yet will present a grilled appearance thereto.

In graphing logs of geological formation, as is encountered in drilling oil wells, after the drum 36 is rotated to the desired position by the index mechanism above described, any of the various keys 59, representing various formations, are depressed. Two keys of each formation may be provided if desired and any key upon the upper tier may be struck at the same time as any key on the lower tier, each key being designed to cover only one-half of the strip and thus give a dual formation symbol side by side, or each key may represent a different formation and may print successively a single width of formation symbols upon a strip.

Various adjustments are provided to keep the various mechanisms coordinated with exacting accuracy.

I claim:

1. In a machine of the character described, the combination of a movable support adapted to carry a printing surface, means for moving said surface varying distances, means for printing symbols on said surface, and means for variably partially shielding the printing means relative to the surface to vary the length of the printed symbol.

2. In a machine of the character described, the combination of a rotatable drum adapted to receive a record strip thereon, means for rotating said drum through varying predetermined distances, means for printing symbols on said record strip on the drum including a printing bar, and means for variably partially shielding the record strip on the drum from the bar to vary the length of the printed symbol applied thereto.

3. A machine of the character specified comprising a rotatable drum, means for selectively rotating said drum, and means for selectively imprinting abutting, aligned, multi-colored symbols of selective lengths in continuous sequence on a record strip on said drum.

4. A machine of the character specified comprising a rotatable drum, means for selectively rotating said drum, means for selectively imprinting abutting, aligned, multi-colored symbols of selective lengths in continuous sequence on a record strip on said drum, and individual multiple color inking pads for the printing means.

5. A machine of the character specified comprising a rotatable drum, means for selectively rotating said drum, means for selectively imprinting abutting, aligned, multi-colored symbols of selective lengths in continuous sequence on a record strip on said drum, pivoted inking elements, and spring-pressed means for automatically tripping said inking elements.

6. In a graphing machine of the character described, the combination of a rotatable drum adapted to carry a printing surface, printing means cooperating with said drum, and a rotatable indexing shield mounted for movement coaxially of the drum and cooperating therewith for selective location of an imprinting edge on said surface.

7. In a graphing machine of the character described, the combination of a rotatable drum adapted to carry a record strip, means cooperating with said drum for printing on said record strip, and an indexing shield rotatable relative to said drum for selective location of a printing edge on said record strip.

8. In a graphing machine of the character described, the combination of a rotatable drum adapted to carry a printing surface, printing means cooperating with said drum, and a grilled shield mounted for swinging movement coaxially of the drum and cooperating therewith for obtaining a varied printing effect therethrough on said printing surface.

9. In a graphing machine, the combination of a support for a strip, printing means cooperating with said support for printing on said strip, and a grilled shield mounted for movement into and out of the space between the printing means and the support.

10. In a graphing machine, the combination of a rotatable drum adapted to support a strip,

printing means cooperating with said drum for printing on said strip, a grilled shield mounted for swinging movement into and out of the space between the printing means and the support, and means for operating said shield.

11. In a graphing machine of the character described having printing means adapted to print symbols in edge to edge relation, an indexing shield for selecting location of an imprinting edge, and a shield reset mechanism comprising a cam connected with said shield to reset the shield to the edge of an imprinted symbol.

12. In a machine of the character described, the combination of accumulative actuating members, each carrying a rack and a pawl, said pawl being in position to engage the rack of an adjacent member, and means for actuating the accumulative actuating members.

13. In a machine of the character described, the combination of accumulative actuating plates, each carrying a rack and a pawl, said pawl being in position to engage the rack of an adjacent plate, and keys for actuating the plates.

14. In a machine of the character described, the combination of accumulative actuating plates, each pivoted near one edge and carrying a pawl thereon adjacent the pivot, each plate carrying a depending rack in position to be engaged by the pawl of an adjacent plate, and keys for actuating said plates.

15. In a machine of the character described, the combination of accumulative actuating plates, each pivoted near one edge and carrying a pawl thereon adjacent the pivot, each plate carrying a depending rack in position to be engaged by the pawl of an adjacent plate, keys for actuating said plates, and a slidable releasing plate having means for engaging the racks to release the same from the pawls.

16. In a machine of the character described, the combination of accumulative actuating plates, each pivoted near one edge and carrying a pawl thereon adjacent the pivot, each plate carrying a depending rack in position to be engaged by the pawl of an adjacent plate, keys for actuating said plates, a rotatable indicating member, and means for transmitting the accumulating motion from the plates to the indicating member.

17. In a machine of the character described, the combination of accumulative actuating plates, each pivoted near one edge and carrying a pawl thereon adjacent the pivot, each plate carying a depending rack in position to be engaged by the pawl of an adjacent plate, keys for actuating said plates, a rotatable drum adapted to receive a record strip thereon, and gearing for transmitting the accumulating motion from the accumulative actuating plates to said drum for turning the same to a predetermined extent.

18. In a machine of the character described, the combination of accumulative actuating plates, each pivoted near one edge and carrying a pawl thereon adjacent the pivot, each plate carrying a depending rack in position to be engaged by the pawl of an adjacent plate, keys for actuating said plates, a rotatable drum adapted to receive a record strip thereon, gearing for transmitting the accumulating motion from the accumulative actuating plates to said drum for turning the same to a predetermined extent, printing members associated with said drum, and key-controlled means for actuating said printing members.

19. In a machine of the character described, the combination of key-controlled accumulative actuating means, a rotatable drum, means operatively connected with the accumulative actuating means for turning said drum, and key-controlled printing means associated with the drum in position to print thereon.

LESLIE CHERRY.