

Nov. 8, 1938.

F. J. HOLLEY

2,136,134

GRAPHIC PATTERN OR RECORDING MACHINE

Filed Dec. 9, 1937

5 Sheets-Sheet 1

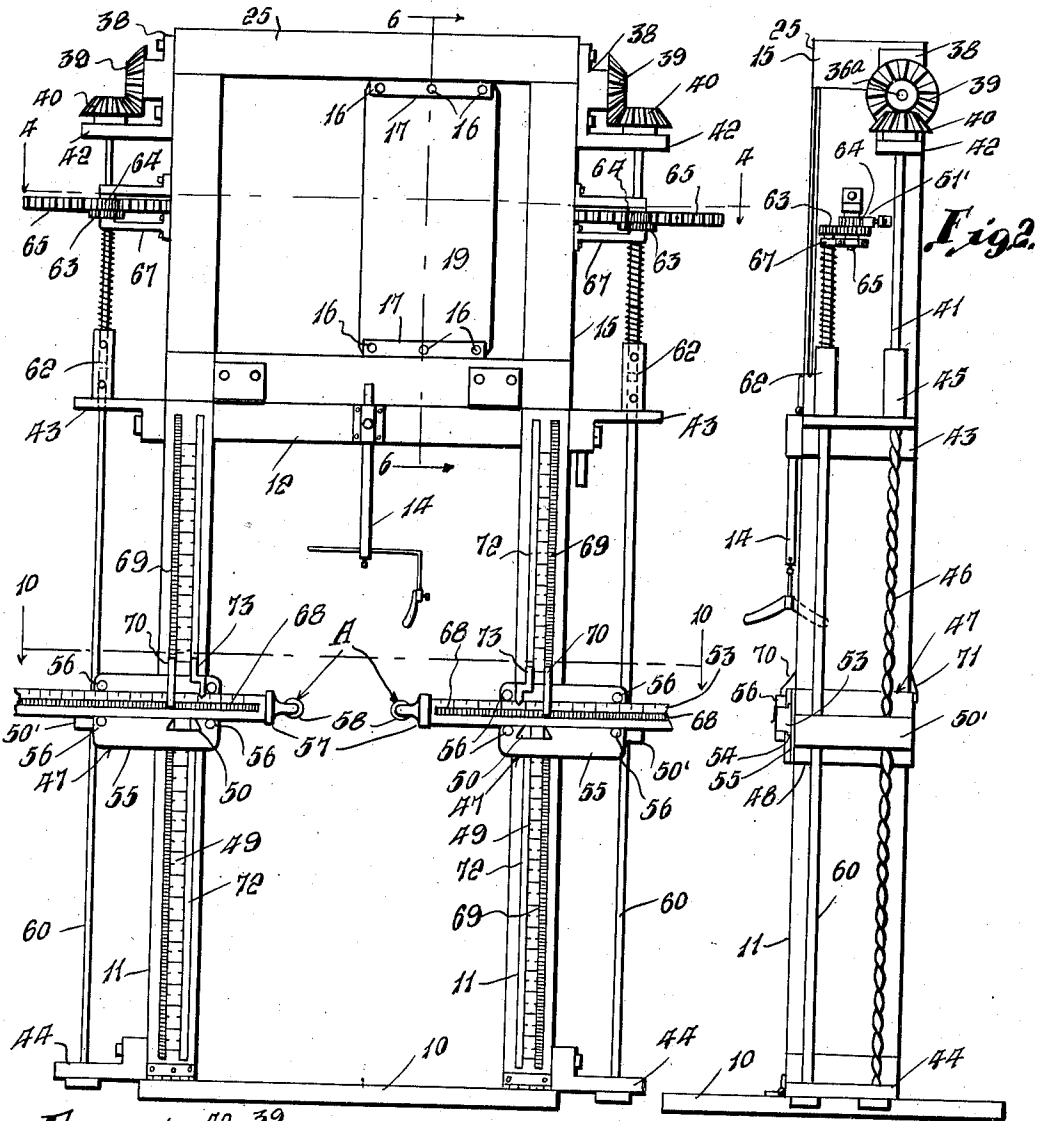
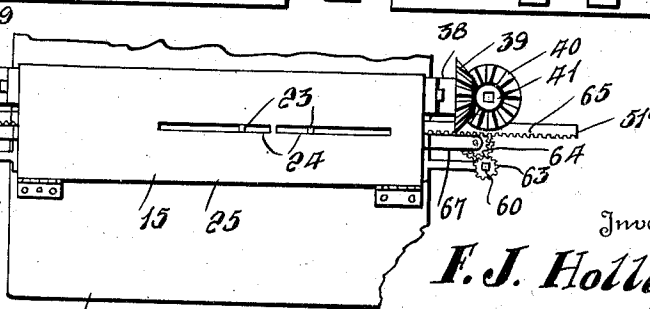


Fig. 1.

Fig. 3.



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Nov. 8, 1938.

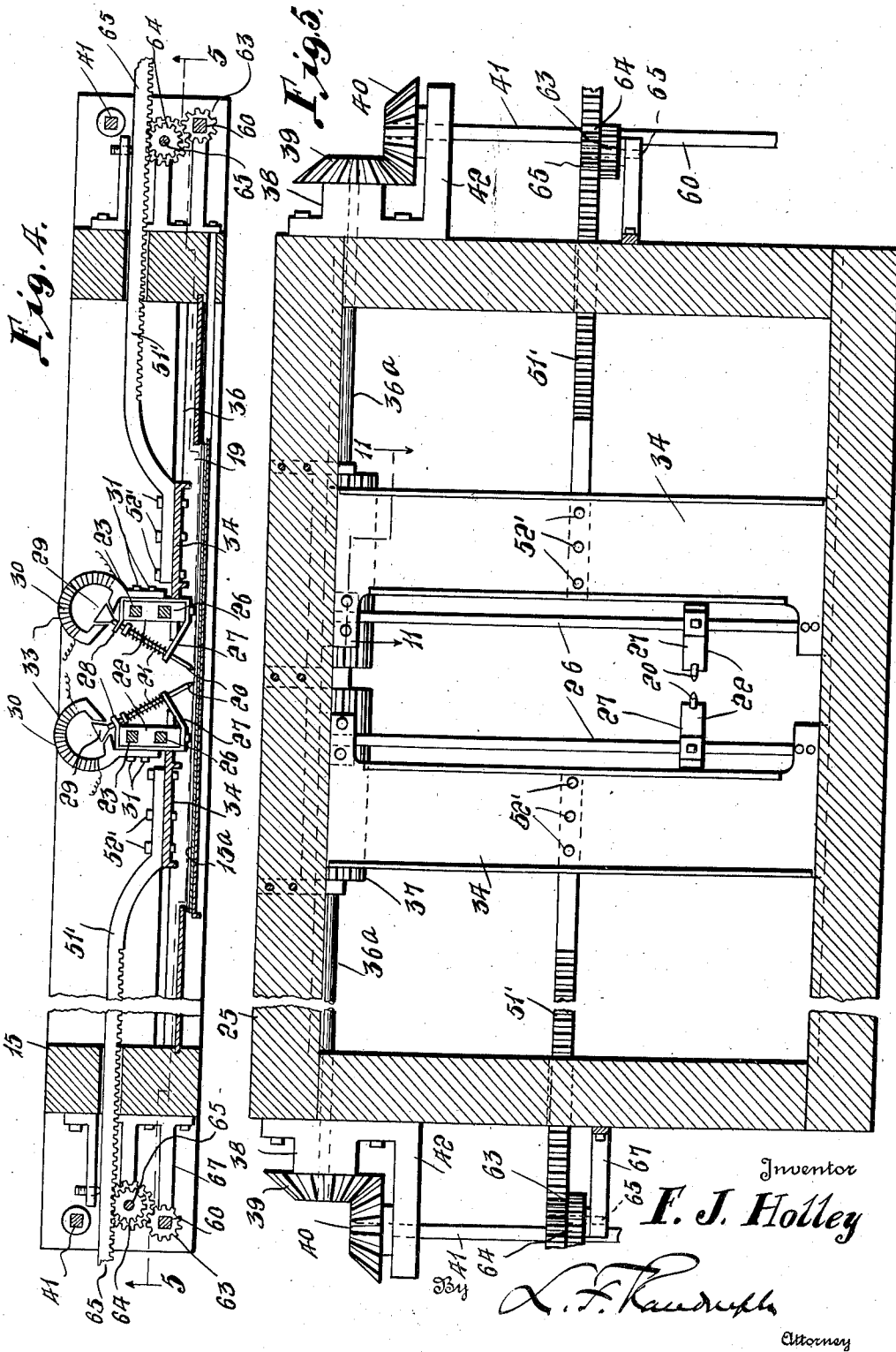
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GRAPHIC PATTERN OR RECORDING MACHINE

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5 Sheets-Sheet 2



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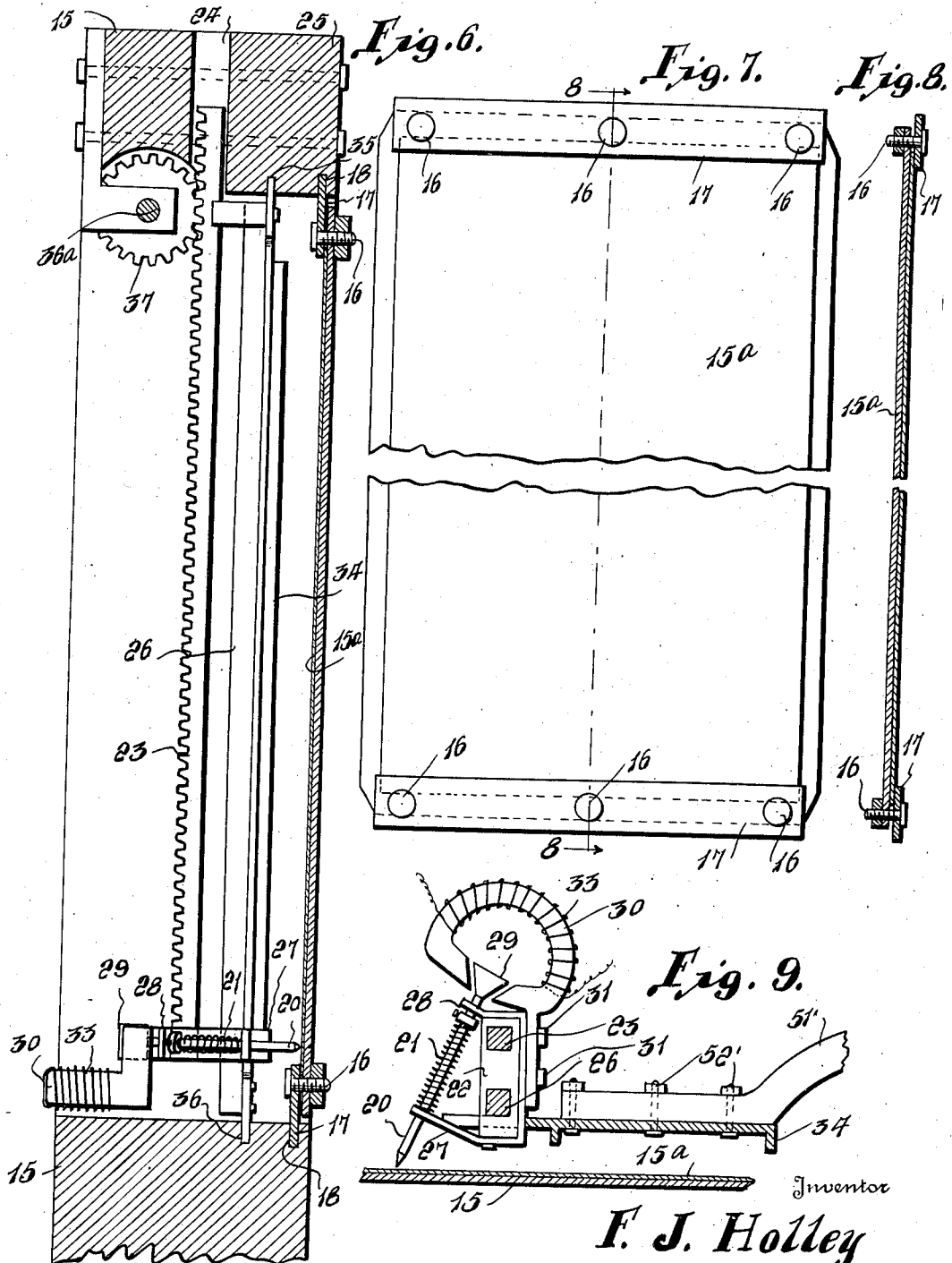
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GRAPHIC PATTERN OR RECORDING MACHINE

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5 Sheets-Sheet 3



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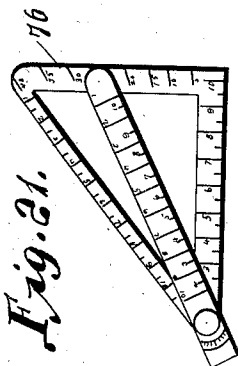
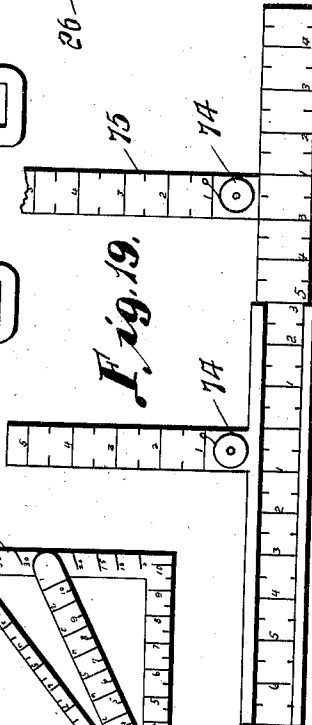
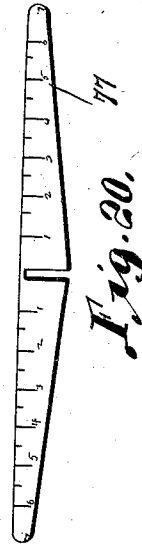
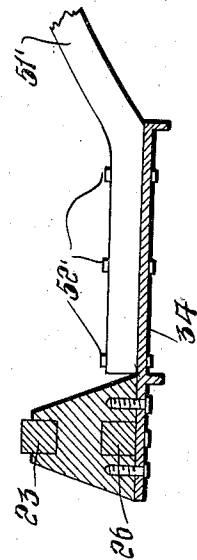
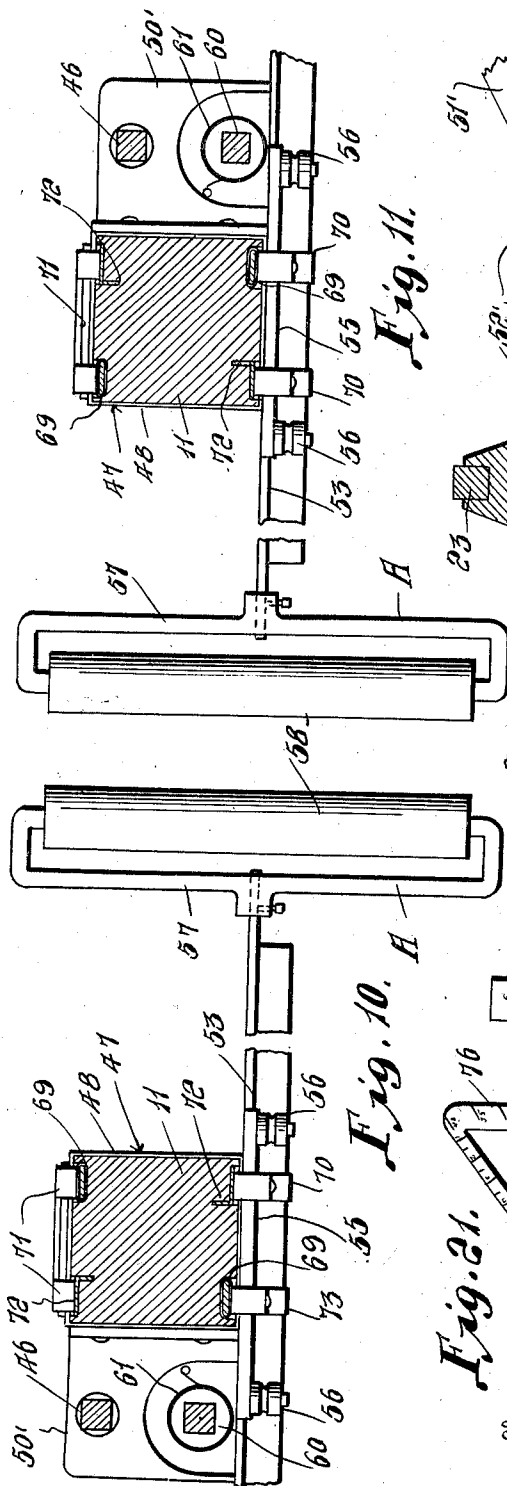
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GRAPHIC PATTERN OR RECORDING MACHINE

Filed Dec. 9, 1937

5 Sheets-Sheet 4



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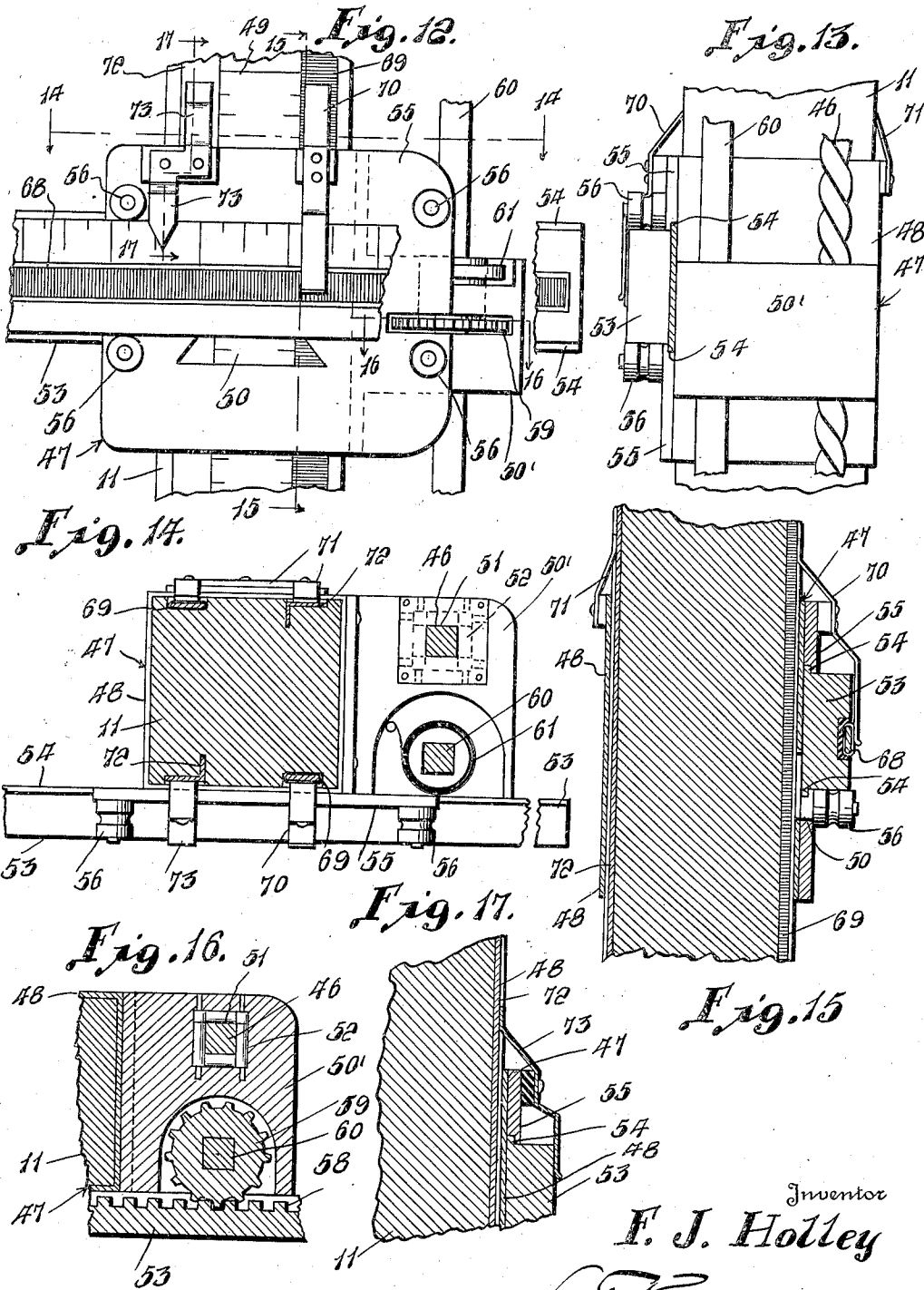
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GRAPHIC PATTERN OR RECORDING MACHINE

Filed Dec. 9, 1937

5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,136,134

GRAPHIC PATTERN OR RECORDING MACHINE

Frank J. Holley, Ventura, Calif.

Application December 9, 1937, Serial No. 179,019

7 Claims. (Cl. 33-23)

This invention relates to a machine adapted for manual operation to automatically and graphically record, according to the contour of a figure or object, as in custom tailoring.

The more specific objects and advantages will in part be pointed out hereinafter and otherwise become apparent from a consideration of the accompanying drawings, among which objects and advantages may be mentioned manufacture at minimum cost and expeditiously, the production of a complete graphic print of the customer with the measure on a single sheet, the elimination of guesswork and manual operation when the electrical parts fail to operate.

In said drawings:—

Figure 1 is a front elevation of the apparatus;

Figure 2 is a side elevation thereof; and

Figure 3 is a plan view thereof;

Figure 4 is a horizontal section on an enlarged scale, taken on the plane of line 4—4 of Figure 1;

Figure 5 is a view primarily in rear elevation of the recording frame taken on the plane of line 5—5 of Figure 4; and

Figure 6 is a vertical section on an enlarged scale taken through the recording frame on the plane of line 6—6 of Figure 1;

Figure 7 is an elevation of a recording sheet and its holder;

Figure 8 is a vertical section taken on the line 8—8 of Figure 7;

Figure 9 is a fragmentary section showing the stylus and its mounting;

Figure 10 is a detail section taken on the line 10—10 of Figure 1;

Figure 11 is a detail section taken on the plane of line 11—11 of Figure 5;

Figure 12 is an enlarged elevation, partly broken away, showing one of the carriages and associated parts;

Figure 13 is a section taken substantially on the line 13—13 of Figure 12;

Figure 14 is a section taken substantially on the line 14—14 of Figure 12;

Figure 15 is a vertical section taken on the line 15—15 of Figure 12;

Figure 16 is a detail section taken on the line 16—16 of Figure 12;

Figure 17 is a detail section taken on the line 17—17 of Figure 12; and

Figure 18 is a detail rear elevation of the slide rule;

Figure 19 is an elevation of the slidable arm-hole square device;

Figure 20 is an elevation of the plus rule and

Figure 21 is an elevation of the shoulder protractor which may be employed.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, the apparatus employs a base 10 having spaced apart uprights 11 thereon and a top bar or beam 12, forming a measuring frame about a space 13 in which the person or object is adapted to stand centrally, in registration with an adjustable head gauge 14 mounted by the beam 12. Superposed on the beam 12 is a rectangular recording frame 15.

Devices A are adapted to be moved manually over the body or object and through means later to be specifically described the configuration is graphically reproduced on a sheet 15a for instance of paper. Instead of a single sheet, manifold copies may be made by providing a plurality of sheets with interposed carbon or other transfer medium on the sheets or on carbon sheets. The sheet or sheets may be removably fastened at the rear of the frame 15 by means of removable bolts 16 engaging a plate and guide bars 17. Said guide bars 17 are slidably mounted in grooves 18 in the upper and lower cross members of frame 15. In this way, the sheet is slidably mounted transversely of the frame 15 so that its position may be changed to receive various graphs, to enable all desired graphs of the same person or figure to be produced on a single sheet, without overlapping of any of them. The sheet 15a and graphs may be observed at any desired time through a window 19 provided in the front of the frame 15.

Co-acting with the sheet means 15a, is a pair of individually operable needles or styli 20 which are normally spaced from the paper sheet 15a under the urgency of coil springs 21. Each stylus 20 is carried by a bracket 22 rigidly carried by vertical rack bars 23. Rack bars 23 are vertically slidable through openings 24 in the upper cross member 25 of frame 15. Mounted by the frame 15 in parallelism to the rack bars 23 are guide bars or rods 26 on which the brackets 22 are also slidable.

Said bracket 22 has angularly disposed arms 27 and 28, slidably mounting the associated stylus 20 and the latter has a head 29 associated with an electromagnet 30 fastened as at 31 to the bracket 22. A coil 33 of each magnet 30, is adapted to be individually energized, in order to project the stylus into recording position for making a record on the sheet 15a. The circuit or circuits for the coils 33 may be controlled in any suitable way, for instance manually.

The aforesaid rack bars 23 and guide bars 26 are carried by laterally slidable follower plates 34, movable at top and bottom in grooves 35 in the upper member 25 and lower member 36 of the frame 15. It will be realized that the slots 24 are laterally elongated or enlarged to accommodate the movement of the rack bars 23 in both directions.

Suitably journaled adjacent the top of the frame 15 are cross shafts 36a, each of which has a gear wheel 37 keyed thereto. The gear wheels 37 are elongated and have teeth enmeshed with the teeth of the rack bars 23. At the ends, shafts 36a are journaled in bearings 38 fastened to frame 15 and beyond the same have beveled gears 39 keyed thereto, enmeshed with beveled gears 40, keyed to vertical shafts 41, journaled in parts 42 of said bearings 38 and also journaled in bearings 43 and 44 fastened to the top member 12 and to the uprights 11 adjacent their bases, respectively. Said shafts 41 are in sections adjustably coupled together as at 45. The lower section of the shaft 41 is a worm or has a spiral groove as at 46. The worm or portion 46 of shaft 41 is square in cross section.

Vertically slidable carriages 47 are provided one for each upright 11 and they have rectangular straps 48 surrounding such uprights. The uprights have scales, rules or delineations thereon as at 49 and the carriages are cutaway at 50 to enable observation thereof at the proper point. These carriages are provided with mountings 50' having square openings 51 there-through, at each edge or side of which roller 52 is journaled, the spiral or screw portions 46 passing through the openings 51 and being engaged on all four sides by a roller 52, to minimize friction. As a result, upon moving the carriages 47 vertically, the engagement thereof at openings 51 with the spiral shafts or worms 46, will rotate the shafts 41 and through the gearing 40 and 39, shafts 36a, gear 37 and rack bars 23, move the brackets 22 vertically and accordingly the styli 20 vertically over the sheet means 15a, producing a graphic record, it being understood, that the styli are moved into recording position when the magnets 30-33 are energized as hereinbefore stated.

In addition to vertical movement for the styli, lateral or horizontal movement is also adapted to be imparted thereto, to which end the followers 34 are movable laterally, in their grooves 35. Such followers 34 have rack bars 51' bolted thereto as at 52'.

Rules or calibrated rods 53, preferably calibrated on opposite sides and having the numerals running from opposite ends, are mounted by and transversely slidable with respect to the carriages. Such rules or shafts 53 have flanges 54 which are engaged by hold down plates 55 secured to the carriages and overlapping the same. Such plates have rollers 56 suitably journaled thereon to aid in supporting and guiding the shafts 53. Said shafts 53 carry contour followers or traversing devices 57 having rotatable rollers 58. The rollers are adapted to be arranged in contact with the body or other object and to follow the contour thereof, accordingly sliding the shafts 53.

Said shafts 53 have rack teeth 58 which are enmeshed with the teeth of pinions 59 journaled on the mounts 50'. Such pinions 59 while rotatable on and carried by the mounts 50', are also slidable on vertical shafts 60, preferably

square in cross section and engaging square openings in the pinions 59, as best shown in Figure 16.

Shafts 60 are disposed in parallelism to the shafts 41 and are journaled in bearings 44 and 43. Said shafts 53 are normally retracted in their outermost positions through the action of clock springs 61, fastened to the pinions and also fastened to the mounts 50'.

Said shafts 60 are sectional, the sections being coupled together as at 62 and the upper sections being in driving relation with pinions 63 enmeshed with pinions or gears 64 journaled on stub shafts 65 mounted by brackets 67 connected to the frame 15. Said gear wheels 64, in turn, are enmeshed with the teeth 65 of the previously mentioned rack bars 51 so that the latter may be moved laterally to indirectly move the styli accordingly.

Mechanism may be employed to electrically operate the styli and other parts including a rheostat or resistance 68 carried by each staff 53 and coacting rheostats or resistance 69 disposed vertically on each upright 11. Such electric circuit means may also include contacts 70, associated with the resistance 68, and contacts or conductors 71, 72 and 73, the latter also being formed into a pointer to coact with the calibrations of the shafts 53.

In Figure 13, the staff 53 is detailed while in Figure 19, a two part sliding arm hole square which may be used, is disclosed, tape measures being provided thereon as at 74, the square as a whole being designated 75. A shoulder protractor as shown in Figure 21, at 76 may also be used in the measuring and calculation as is likewise true of the plus rule and toach 77 of Figure 20.

To briefly recapitulate, the subject or object stands on the platform 10 now positioned through the aid of the gauge 14. The rollers 58, individually are then applied against the adjacent portions of the body, following the contour thereof, and especially entering into the arm holes which movement in a vertical direction rotates the worm shaft 46 and through gears 40 and 39, shaft 36, gears 37, rack 23, move the styli 20 vertically and in contact with the sheet means 15a.

At the same time, the lateral movement of the shafts 53, caused by the said rollers 58 following the contour of the body, will through the medium of the rack teeth 58' and gear 59, turn shafts 60 and through the gears 63 and 64 and rack bars 65, move the styli 20 and associated parts laterally. As a result, both lateral and vertical movement according to the contour of the body, will be transmitted to the styli and graphically produced on the sheet 15a. The electromagnets are energized by any preferred means to move the styli 20 into recording position, the circuits to the magnets being closed in any suitable manner to actuate the styli as stated, and when the magnets are deenergized the springs 21 will react to move them into non-recording positions. It will be realized, that the devices A are operated independently, or if desired, separate operators may operate each one at the same time. Various drafts may be made on the same sheet 15a in view of the fact that the same is movable laterally in the recording frame. This is greatly advantageous as all graphs for a person or an object may be made on a single sheet.

Various changes may be resorted to provided

they fall within the spirit and scope of the invention.

I claim as my invention:—

1. Apparatus of the class described having an upright frame provided with a base on which an object is adapted to stand, individually operable follower means mounted by the frame on opposite sides thereof engageable with the object, and recording means supported by and above the frame and operable through movement of the follower means.

2. Apparatus of the class described having an upright frame provided with a base on which an object is adapted to stand, individually operable follower means mounted by the frame on opposite sides thereof engageable with the object, and recording means supported by and above the frame and operable through movement of the follower means, said recording means including a sheet, and means to movably mount the sheet whereby different graphs may be produced thereon while in the frame.

3. Apparatus of the class described having a base on which an object is adapted to stand, follower means movable on said base in contact with the contour of an object, a slide operable by said means, a rotatable shaft rising from the base geared to the slide for rotation through operation of the slide, and recording means operable through rotation of said shaft, comprising an upright bar, a gear and rack connection disposed transversely between the shaft and bar, and a stylus carried by the bar.

4. Apparatus of the class described having a base on which an object is adapted to stand, follower means movable on said base in contact with the contour of an object, a slide operable by said means, a rotatable shaft rising from the base geared to the slide for rotation through operation of the slide, and recording means operable through rotation of said shaft, comprising an upright bar, a gear and rack connection disposed transversely between the shaft and bar, a follower plate slidably mounted in the frame, a stylus mounted by the follower plate, and means to mount a sheet in the frame.

5. Apparatus of the class described having follower means to contact with the contour of an object, a slide operable by said means, a rotatable shaft geared to the slide for rotation through operation of the slide, recording means operable through rotation of said shaft, comprising a frame, a bar, a gear and rack connection between the shaft and bar, a follower plate slidably mounted in the frame, a stylus mounted by the

follower plate, means to mount a sheet in the frame, said frame being adjustable to enable the sheet to receive different graphs, said follower plate including a bracket directly mounting the stylus, and means on the follower plate mounting the bracket for movement at an angle to the path of movement of the follower plate.

6. Apparatus of the class described having follower means to contact with the contour of an object, a slide operable by said means, a rotatable shaft geared to the slide for rotation through operation of the slide, recording means operable through rotation of said shaft, comprising a frame, a bar, a gear and rack connection between the shaft and bar, a follower plate slidably mounted in the frame, a stylus mounted by the follower plate, means to mount a sheet in the frame, said frame being adjustable to enable the sheet to receive different graphs, said follower plate including a bracket directly mounting the stylus, means on the follower plate mounting the bracket for movement at an angle to the path of movement of the follower plate, said follower means including a shaft movable at an angle to the path of movement of the slide, and means operable by the staff to effect the said movement of the bracket relatively to the follower plate.

7. Apparatus of the class described having follower means to contact with the contour of an object, a slide operable by said means, a rotatable shaft geared to the slide for rotation through operation of the slide, recording means operable through rotation of said shaft, comprising a frame, a bar, a gear and rack connection between the shaft and bar, a follower plate slidably mounted in the frame, a stylus mounted by the follower plate, means to mount a sheet in the frame, said frame being adjustable to enable the sheet to receive different graphs, said follower plate including a bracket directly mounting the stylus, means on the follower plate mounting the bracket for movement at an angle to the path of movement of the follower plate, said follower means including a shaft movable at an angle to the path of movement of the slide, means operable by the staff to effect the said movement of the bracket relatively to the follower plate, comprising a mount on the follower means, a gear journaled on the mount, said staff having rack teeth enmeshed with said gear, a shaft polygonal in cross section on which the said gear is slidably mounted, and means to operate the rack bar from the last mentioned shaft.

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