June 19, 1951 G. T. ALFREY 2,557,212

DRAFTING INSTRUMENT FOR DRAWING BROKEN LINES

Filed June 8, 1945 2 Sheets-Sheet 1

Fig. 1.

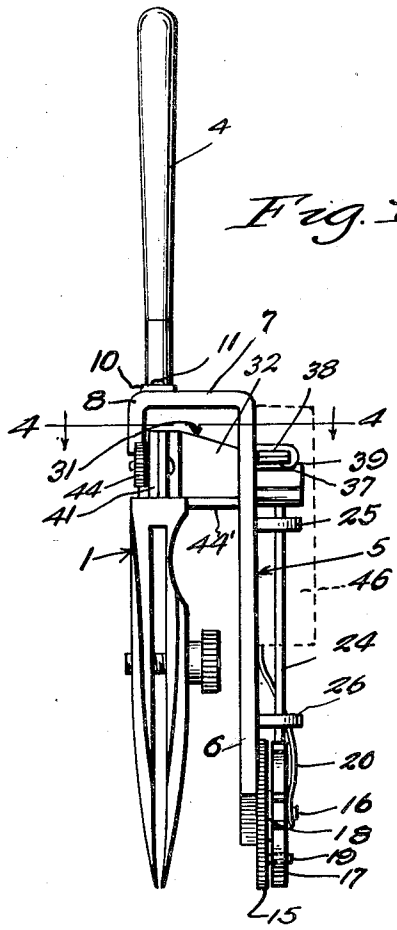



Fig. 2.

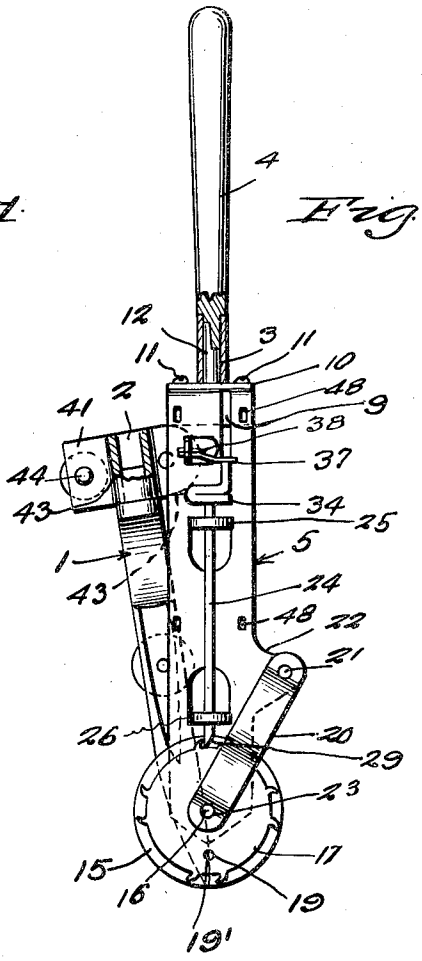
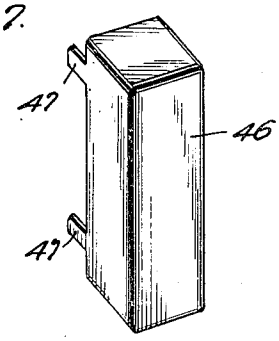



Fig. 7.




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DRAFTING INSTRUMENT FOR DRAWING BROKEN LINES

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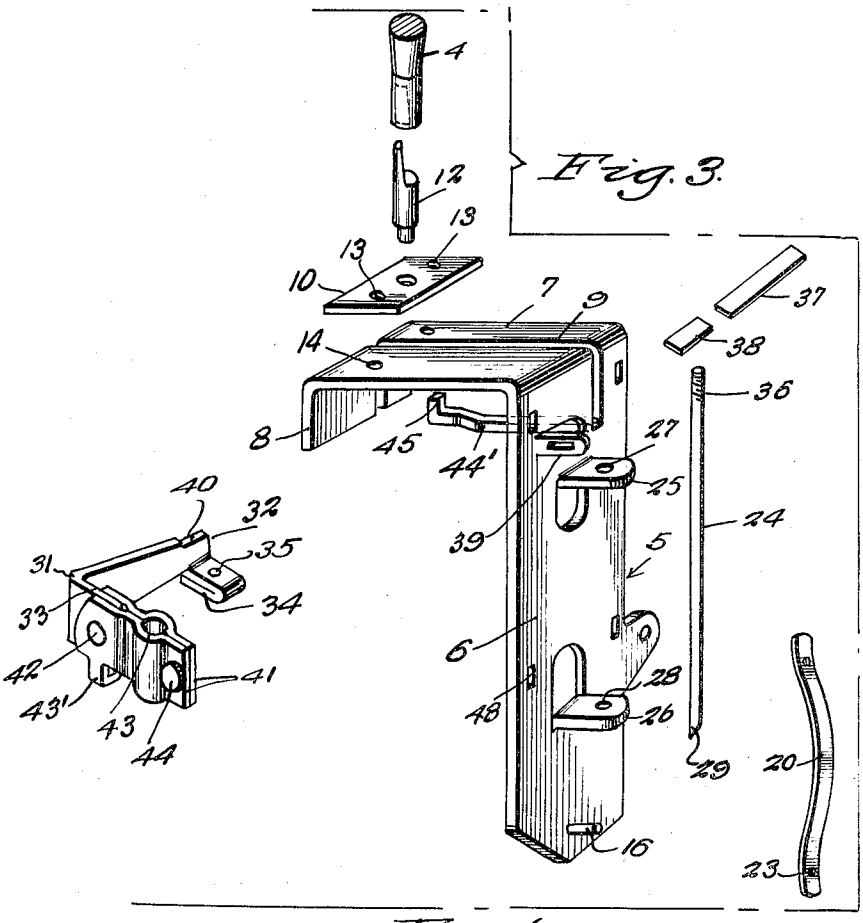



Fig. 3.

Fig. 5

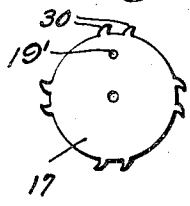
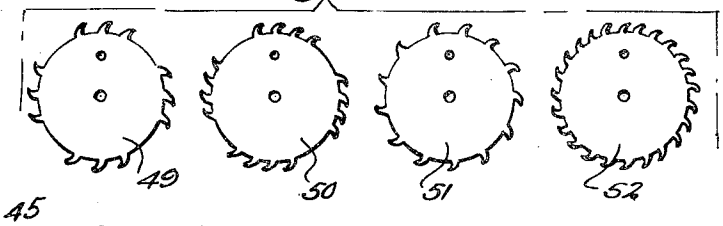



Fig. 6.



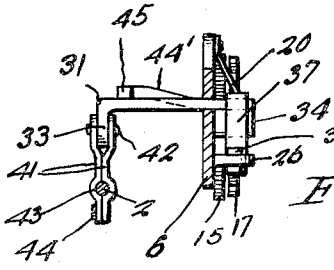




Fig. 4.

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# UNITED STATES PATENT OFFICE

2,557,212

## DRAFTING INSTRUMENT FOR DRAWING BROKEN LINES

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Application June 8, 1945, Serial No. 598,225

2 Claims. (Cl. 33—39)

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My invention relates to improvements in drafting instruments, the primary object in view being to equip the usual ruling, or straight line, pen of commerce with inexpensive, easily applied means for operating the same to delineate various types of broken lines, either dot-and-dash lines, dash lines, or dotted lines, and so that said lines may be delineated quickly and easily without being blurred.

Another object is to provide an attachment for ruling pens and the like in the form of a wheel-supported carriage equipped as the same is rolled over the work to elevate and lower the ruling pen to cause the same to delineate clean, sharp, broken lines without spattering ink, and which is adapted to be easily and quickly attached to and detached from the ruling pen, is serviceable, comparatively inexpensive to manufacture, and will not readily get out of order or develop operating defects.

Other and subordinate objects, also comprehended by my invention, together with the precise nature of my improvements and the manifold advantages thereof, will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in front elevation of my invention, in a preferred embodiment thereof.

Figure 2 is a view in side elevation, partly broken away and shown in section.

Figure 3 is a view in perspective of the carriage and parts carried thereby and shown disassembled.

Figure 4 is a view in horizontal section taken on the line 4—4 of Figure 1.

Figure 5 is a view in side elevation of the toothed wheel detached.

Figure 6 is a view illustrating, in side elevation, modified types of toothed wheels.

Figure 7 is a view in perspective of the guard detached.

Reference being had now to the drawings by numerals, my invention has been shown therein, by way of illustration of a preferred embodiment thereof, as comprising an attachment for the usual ruling, or straight line, pen 1 of the type having a shank 2 adapted to fit in a socket 3 in the lower end of a straight handle 4 with a wedge friction fit, said shank 2 and socket 3 forming a pull-apart connection.

According to my invention, a carriage 5 for the ruling pen 1 and handle 4 is provided and which is of bar-like form and suitable metal and

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of inverted L-shape, thereby forming a flat, straight leg 6 on said carriage having a lateral, right-angled, flat, upper end flange 7 terminating in a downturned, short side lip 8 spaced from the leg 6 and parallel therewith. A slot 9 is formed in the top of said carriage 5 extending from side to side thereof through said lip 8, flange 7 and then downwardly of said leg for a distance suitable for a purpose presently seen. The flange 7 extends from what constitutes the inner side of the leg 6.

A rectangular, metal plate 10 is secured on top of the flange 7 crosswise thereof by screws, as at 11. A shank 12, similar to the shank 2, rises centrally from the plate 10 and to which the socket 3 of the handle 4 is frictionally fitted, as shown in Figure 2. The plate 10 and flange 7 are provided with suitable screw holes 13, 14 for the screws 11.

A milled traction wheel 15 is provided at the lower end of the leg 6 on the outer side of said leg in substantially the longitudinal center of the same. The traction wheel 15 is rotatably mounted on a lateral stud 16 secured in any suitable manner in said leg 6. A toothed pen-operating wheel 17, smaller than the traction wheel 15, is rotatably and removably fitted on the stud 16 with a thin washer 18 between the same and said traction wheel 15 fitted on the stud 16 with a forced fit. A lateral eccentric stud 19 is provided on the traction wheel 15 to extend into an eccentric opening 19' in the toothed pen-operating wheel 17 and thereby fasten said wheels 15, 17 together. A bowed, leaf, keeper spring 20 is riveted at one end, as at 21, to an ear 22 extending from one edge of the leg 6, said spring 20 having an apertured end 23 fitting over the stud 16 to press the toothed wheel 17 against the washer 18. The keeper spring 20 is rotatable about the rivet 21 for a purpose presently seen.

A lifter rod 24 is provided on the outer side of the leg 6, in the longitudinal center thereof, and which is endwise slidable vertically in the plane of the toothed wheel 17 radially thereof in a pair of upper and lower bearing ears 25, 26 suitably apertured, as at 27, 28, for the extension of said lifter rod therethrough. The bearing ears 25, 26 are preferably punched out of the leg 6 to extend laterally therefrom. The lifter rod 24 has a beveled lower end 29 and the teeth of the pen-operating wheel 17 are beveled on one side, as at 30, whereby said pen-operating wheel 17, when rotated in one direction, elevates the lifter rod 24 intermittently with a camming action.

A pen lifter bar 31, of right-angled form and

any suitable metal, is interposed between the leg 6 and the lip 8 with a long arm 32 extended flatwise through the portion of the slot 9 in the leg 6 for vertical sliding movement, and a shorter leg 33 extending toward what constitutes the front edge of the carriage 5. The long arm 32 of said lifter bar 31 is provided with a lateral, lower edge, right-angled lug 34 vertically aligned with the lifter rod 24 and provided with a suitable threaded aperture 35 therein for receiving the upper end of the lifter rod 24, which end is threaded, as at 36, for turning into said aperture 35. A leaf spring 37 is fixed at one end by a wedge 38 in a slotted lug 39 extending laterally from the outer side of the leg 6, the other end of said spring 37 seating in a recess 40 in the longer arm 32 of said lifter bar 31 and urging said lifter bar 31 downwardly relative to said leg 6.

A pair of side-by-side pen-clamping jaws 41 are pivoted at corresponding inner ends thereof to the shorter arm 33 of said lifter bar 31 and by means of a rivet 42, said jaws extending forwardly of the front edge of the carriage 5. The pen-clamping jaws 41 are crimped to form a socket 43 therebetween and in which the shank 2 of the ruling, or straight line, pen 1 is clamped by means of a knurled thumb screw 44 threaded through said clamping jaws 41 adjacent the outer ends thereof. The rivet 42 is designed to frictionally lock the pen-clamping jaws 41 to the shorter arm 33 of the pen lifter bar 31 so that said bar may be swung vertically into different set positions to incline the ruling, or straight line, pen 1 downwardly and rearwardly of the carriage 5, as shown in Figure 2. As will be understood, such pens are usually held at an angle to the vertical. A bottom edge lug 43' is provided on one clamping jaw 41 for engagement with the bottom edge of the shorter arm 33 of said lifter bar 31 to limit downward swinging of said clamping jaws 41. A lifter bar-supporting arm 44' extends laterally from the inner side of the leg 6 beneath the longer arm 32 of said lifter bar 31 to limit downward sliding of said arm 32, and hence downward movement of said lifter bar 31 and said ruling, or straight line, pen 1 relative to the carriage 5. The supporting arm 44' is inclined to the rear side of the longer arm 32 of said lifter bar 31 and provided with an upturned terminal end 45 bearing against the rear side of said longer arm 32 to prevent rearward play of said lifter bar 31 relative to the carriage 5.

A suitable guard 46, with edge lugs 47 adapted to frictionally lock in slots 48 in the leg 6, is provided for covering the part on the outer side of the leg 6 above the lower lug 26.

Referring now to the use and operation of the invention. With the traction wheel 15 traveling over the work, not shown, and the handle 4 and carriage 5 held substantially vertically, the toothed pen-operating wheel 17 cams the lifter rod 24 upwardly, intermittently, and the ruling, or straight line, pen 1 is correspondingly lifted off the work, said lifter rod 24 lifting the pen-lifting bar 31 and hence said ruling, or straight line, pen 1, all in opposition to the spring 37, as will be clear. Thus, the ruling, or straight line, pen 1 is caused to delineate a broken line on the work. The ruling, or straight line, pen 1 may be guided against a T-square, not shown, or the like, or the traction wheel 15 may be similarly guided as found expedient. By pulling the handle 4 off the shank 12, and detaching the ruling, or straight line, pen 1 from the clamping jaws 41, in a manner which will be understood, the carriage 5 and other parts of the invention may be detached, the handle 4 wedged onto the shank 2 and said ruling pen 1 and handle 4 thus assembled for use alone.



The toothed wheel 17 is shown as provided with pairs of teeth arranged in 90° angular relation, whereby the ruling, or straight line, pen 1 will be operated to delineate dashes with a dot between the same. However, modified forms of toothed wheels, such as shown in Figure 6 and designated 49, 50, 51 and 52, may be substituted selectively for the toothed wheel 17 and for delineating different kinds of broken lines. Such substitution may be acomplished easily and quickly by pulling the apertured end 23 of the spring 20 off the stud 16, detaching the toothed wheel 17 from said stud 16 and the stud 19 and replacing said toothed wheel 17 with one of the toothed wheels 49, 50, 51, 52, as desired.

The foregoing will, it is believed, suffice to impart a clear understanding of my invention without further explanation.

Manifestly, the invention, as described, is susceptible of modification both as regards combinations of parts and structural details, and right is herein reserved to such modifications as fall within the scope of the appended claims.

I claim:

1. In combination, a ruling pen, a carriage having a vertically slotted leg with a lateral upper end flange on one side of the same, a lateral bar fixed to and extending from said side of the leg beneath and contiguous said flange, a vertically movable horizontal pen lifter bar between said flange and lateral bar normally resting on said lateral bar with an operating end vertically slidable in said slot for guiding movement of said lifter bar, said operating end extending outwardly of said slot at the side of the leg opposite the flanged side of said leg, means to fasten one end of the ruling pen to the other end of said lifter bar on the flanged side of the leg in depending position, a handle on said flange, and means on the side of the leg opposite the flanged side for intermittently lifting said lifter bar off the lateral bar comprising a traction wheel on the lower end of the leg, and a lifter rod fixed to and depending from the operating end of the lifter bar alongside said leg and intermittently moved upwardly when said wheel is rotated, said pen lifter bar being of right angled form longitudinally to dispose said other end thereof and the fastened end of the pen outwardly beyond one edge of the leg.

2. In combination, a ruling pen, a carriage having a vertically slotted leg with a lateral upper end flange on one side of the same, a lateral bar fixed to and extending from said side of the leg beneath and contiguous said flange, a vertically movable horizontal pen lifter bar between said flange and lateral bar normally resting on said lateral bar with an operating end vertically slidable in said slot for guiding movement of said lifter bar, means to fasten one end of the ruling pen to the other end of said lifter bar on the flanged side of the leg in depending position, a handle on said flange, and means on the leg for intermittently lifting said lifter bar off the lateral bar comprising a traction wheel on the lower end of the leg, and a lifter rod fixed to and depending from the lifter bar alongside said leg and intermittently moved upwardly when said wheel is rotated, said pen lifter bar being of right angled form longitudinally to dispose said

other end thereof and the fastened end of the pen outwardly beyond one edge of the leg.

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## REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 2,036,716 | Nelson | Apr. 7, 1936 |

| Number | |
|---|---|
| | 1,015 |
| | 246,691 |
| | 366,705 |
| | 397,464 |





FOREIGN PATENTS

| Country | Date |
|---|---|
| Great Britain | 1853 |
| Germany | May 8, 1912 |
| France | Aug. 4, 1906 |
| France | Feb. 25, 1909 |