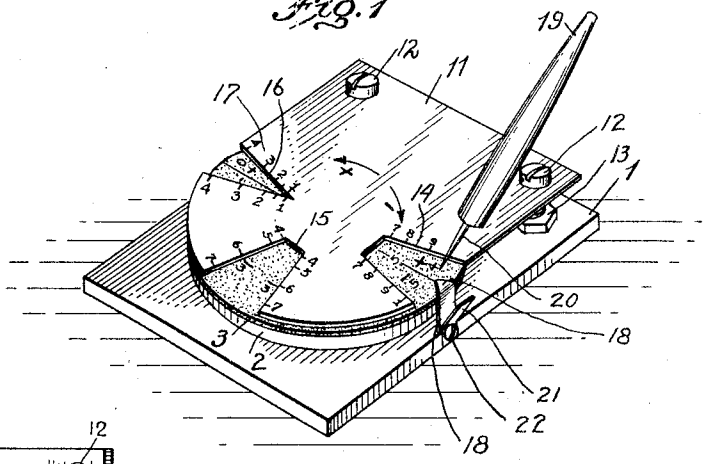
May 30, 1933. G. H. MORSE 1,911,581

DECIMAL POINT FINDER

Filed Sept. 7, 1927

Fig. 1



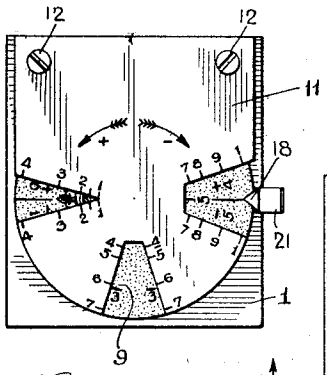


Fig. 4.

Fig. 2

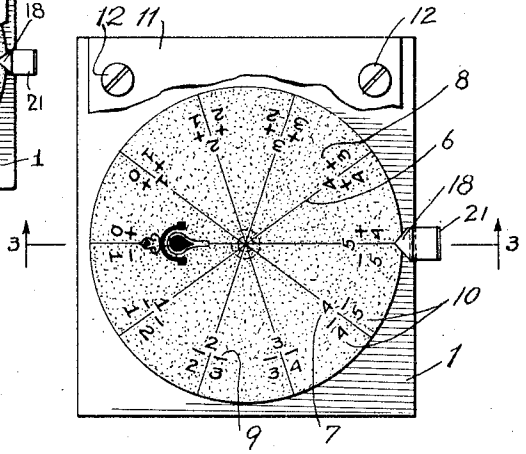
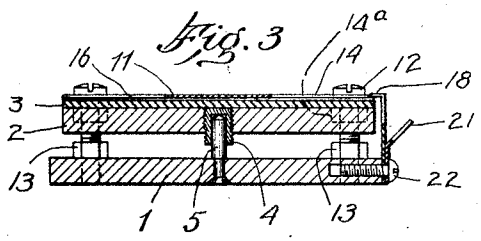


Fig. 3



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UNITED STATES PATENT OFFICE

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DECIMAL POINT FINDER

Application filed September 7, 1927. Serial No. 217,923.

This invention is an improvement in decimal point finders, and more particularly in a device for quickly locating the point when making computations.

One of the primary objects of the invention is the provision of a simple, inexpensive and easily operated device of the character specified, wherein a rotatable dial is provided carrying indications, with means for supporting the dial for rotation with a minimum of friction, and other means for damping or braking the movement thereof.

Another object is the provision of means in connection with the damping or braking means, for exposing portions of the dial at selected positions, and for providing starting and stopping abutments for engagement by a stylus to limit the rotative movement of the dial.

Another object is the provision of a dial having a surface especially adapted for cooperation with a stylus to insure a firm grip of the stylus without damage to the surface of the dial.

In the drawing forming a part hereof:—

Figure 1 is a perspective view of the improved device.

Figure 2 is a plan view with the top plate broken away.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a plan view of the device.

In the present embodiment of the invention a suitable base 1, is provided of any suitable material, such as for instance vulcanized rubber, and a dial or disk is mounted to rotate on the base.

The disk comprises a body-portion 2, of any suitable material, and a facing 3 of a relatively soft material having a high coefficient of friction, as, for instance, rubber. The facing is secured to the body of the disk in any suitable manner, and the said body is provided with a central step bearing 4, which, in the present instance, is in the form of a socket threaded into a central opening in the body.

A pivot pin 5 is supported by the base, being reduced at its lower end to extend through an opening in the base, and headed below the base, as shown. The upper end of the pivot-pin is pointed, and the disk is supported on the point of the pin, thus providing for free substantially-frictionless rotation of the disk on the pin.

The upper face of the rubber facing has radial lines 6 drawn thereon, and in the length of each line somewhat nearer the perimeter of the disk than the center, a numeral 7 is imprinted, or otherwise formed, on the facing.

The numerals 7 are at equal distances from the center, and beyond them at each side of the line is a sign, 8, 9, plus for one-half the facing or dial, and minus for the other half. The plus and minus signs are arranged between each adjacent pair of lines 6.

Outside of the signs, 8 and 9, other numerals 10, are arranged on the facing, a numeral adjacent to each sign, 8 or 9. A covering plate 11 is arranged above the disk, the said plate being held to the base by means of screws 12. The screws are adjustably connected with one end of the base, each screw having a threaded engagement with the base, and having a lock-nut 13 above the base to hold the screw in adjusted position.

The screws pass through openings in the plate and are engaged by lock-nuts 14ª below the plate. By means of the lock-nuts and the screws, the plate may be adjusted toward and from the dial or disk. The plate has openings 14, 15 and 16 of a radial length such that all of the indications on the dial will be successively exposed as the dial is rotated beneath the plate.

The opening 16 is sector-shaped, the side edges of the opening converging to a meeting about three-quarters of the distance from

the perimeter to the center of the dial. The openings 14 and 15 are of greater width at their inner ends, and the plate is provided with a row of numerals 17 at each edge of each opening.

An indicator 18 cooperates with the indications on the dial, the indicator being located at the center of the opening 14. The plate 11 is resilient, so that it may be pressed toward the dial into contact therewith, to brake or immobilize the dial. A stylus 19, having a needle-point 20 is provided for moving the dial. The needle-point may be trust into the soft surface of the dial, whereby to move the dial. Preferably a suitable case is provided for the instrument, and a spring holder 21 is provided for holding the stylus alongside the edge of the base. The plate is secured to the base, together with the indicator 18, by means of a screw 22.

In operation, the problem is preferably arranged so that the answer will be expressed as a common fraction, in which the numerator and denominator, each is composed of factors joined together by multiplication signs. The characteristic of each factor is now determined, in the same manner as when using logarithms. Beginning with the left-hand factor in the numerator the successive characteristics are added or subtracted, each as indicated by its sign, until after all the factors in the numerator have been considered.

With the sum thus obtained the factors of the denominators are then combined in the same manner, except that the algebraic sign before each characteristic is to be inverted. Thus, if a characteristic in the numerator has a positive sign, it is added, whereas a characteristic in the denominator with a positive sign is subtracted.

Having thus found the resultant characteristic, neglecting the mantissas, the corresponding radial line on the dial of the device is set under the indicator as in Figure 1, in which the resultant characteristic is 5. The instrument is thus set whether the resultant characteristic be plus or minus 5. Were the resultant characteristic less than 5, say 3 and plus, we would use the 3 having the two plus signs just below it on either side, and the other 3 were the resultant characteristic minus 3. Each factor is now picked up at one of the openings 14, 15 or 16, where such picking-up is most convenient. The needle-point is lightly thrust into the surface of the dial along an edge of one of the openings, where it is most convenient to pick up the factor.

As, for instance, if the factor is 12,000, it can be picked up along the upper edge of the opening 16, if in the numerator, and at the lower edge of the opening if in the denominator. The point is engaged with the dial at a distance as nearly as the eye can determine $\frac{2}{10}$ths beyond the numeral 1, toward the numeral 2, and the dial is turned until the needle-point engages the opposite edge of the opening. The circular motion thus produced is proportional to the mantissa of the logarithm of the factor being treated.

This process is continued with the factors of the numerator, after which the factors in the denominator are set up in a similar manner, except that the disk is rotated in the opposite direction. When this operation has been completed, the indicator 18 will be at a sector, that is, a space between the radial lines displaying the complete characteristic of the answer and its sign, minus or plus, found near the edge of the disk adjacent to the lines which bound the sector. The plate 11 is of celluloid or like suitable material, and, being resilient, may be used to slow the action of the dial. or entirely to stop the rotation thereof.

What is claimed as new is:

1. A decimal point finder including a base, a dial mounted to rotate thereon, and a plate connected to the base and overlying the dial in spaced relation, and independent thereof, said plate being resilient and movable toward and from the dial, the dial having indicia on the upper face thereof, and the plate sectorial openings with indicia along the edges thereof, said openings being of arc lengths graduated to correspond to the indicia along their edges, the indicia of the dial being visible through the openings and cooperating with the indicia of the plate.

2. A decimal point finder comprising a base, a dial pivotally mounted above the base for free rotation and having indicia on its face, a plate above said dial and base, means securing said plate to the base beyond the periphery of said dial, said means being adjustable to regulate the relative normal position of the plate above the dial, and said plate having an opening through which the indicia on the dial is exhibited and being resiliently depressible against the dial to control rotation thereof.

3. The finder of claim 1 in which the end of the plate away from its point of connection to the base is of semi-circular shape to coincide with the dial, and in which said semi-circular portion is provided with a plurality of cut-out sectors exposing the face of the dial.

4. A decimal point finder including a base, a dial mounted to rotate thereon, and a plate connected to the base and overlying the dial in spaced relation, and independent thereof, the dial having indicia on the upper face thereof, and the plate having sectorial openings to expose said indicia on the dial, said sectorial openings being of increased width progressing around the dial.

5. A decimal point finder including a base, a dial mounted to rotate thereon, and a plate connected to the base and overlying the dial in spaced relation, and independent thereof, the dial having indicia on the upper face thereof, and the plate sectorial openings with indicia along the edges thereof, said openings being of arc lengths graduated to correspond to the indicia along their edges, the indicia of the dial being visible through the openings and co-operating with the indicia of the plate.

Signed at Harrisburg, in the county of Dauphin and State of Pennsylvania this 22nd day of July A. D. 1927.

GEORGE H. MORSE.