8. GEOMETRICAL INSTRUMENT.

No. 871,333. PATENTED NOV. 19, 1907.

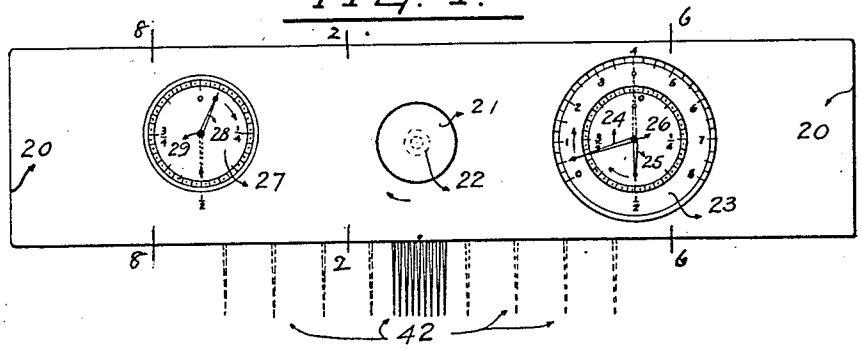
G. GIAMBRA.

SPACING INSTRUMENT.

APPLICATION FILED JULY 30, 1906.

3 SHEETS—SHEET 1.

FIG. I.



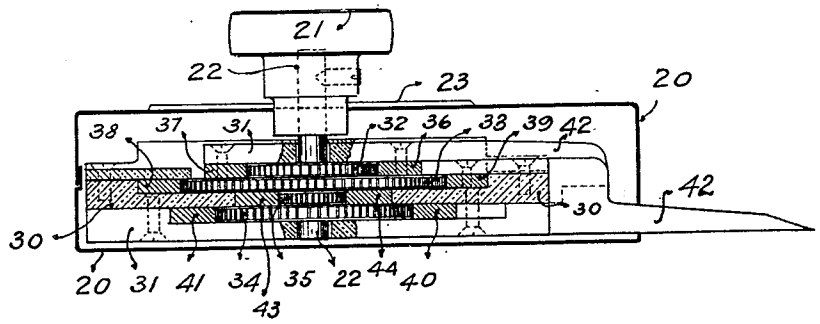


FIG. II.

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3 SHEETS—SHEET 2.

FIG. III.

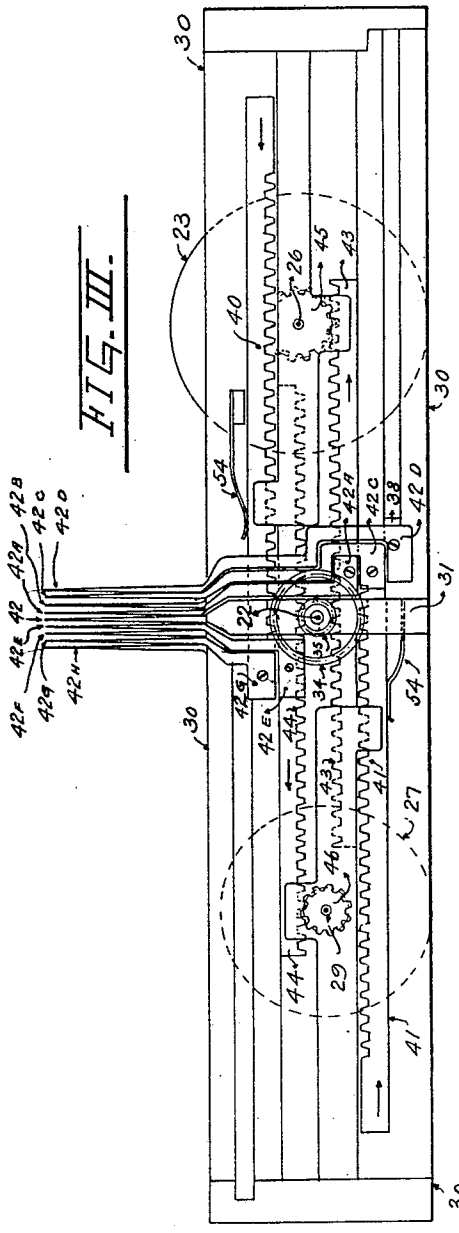
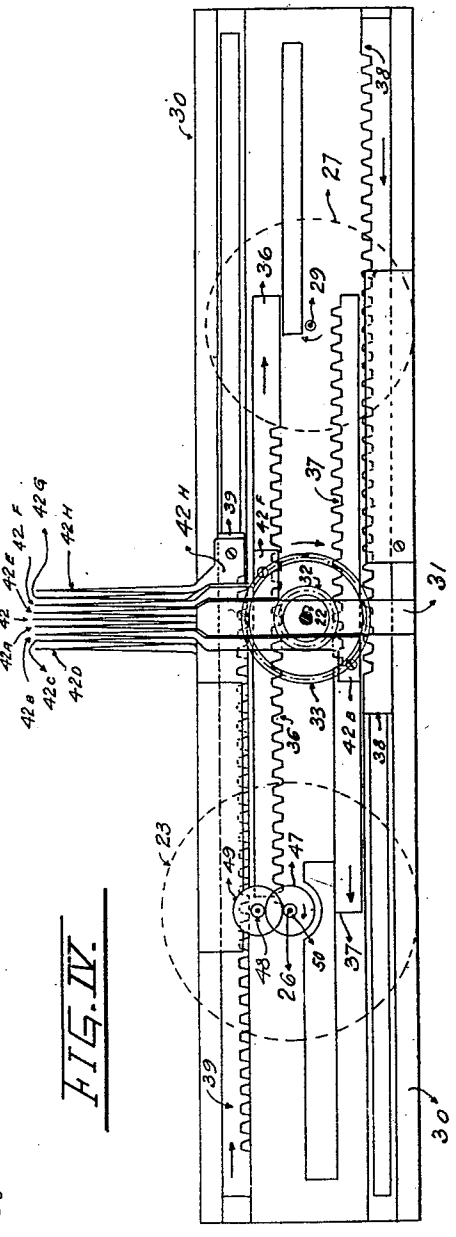


FIG. IV.



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3 SHEETS—SHEET 3.

FIG. V.

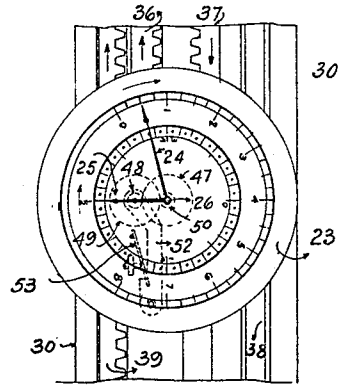


FIG. VI.

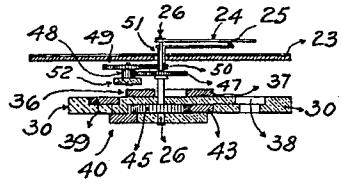


FIG. VII.

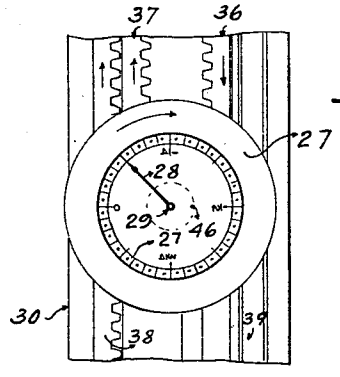
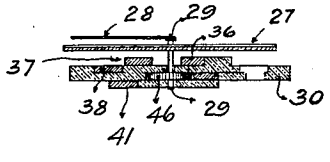


FIG. VIII.



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SPACING INSTRUMENT.

No. 871,333. Specification of Letters Patent. Patented Nov. 19, 1907.

Application filed July 30, 1906. Serial No. 328,316.

To all whom it may concern:

Be it known that I, GANDOLFO GIAMBRA, a subject of the King of Italy, Victor Emanuel III, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Spacing Instruments, of which the following is a specification, reference being had therein to the accompanying drawing.

The object of my invention is to provide an accurate and automatic measuring device for dividers, compasses and like mechanical instruments used in various trades and professions to obviate the necessity of using a rule in ascertaining the measurements of solid columns, the inside and outside of tubular or hollow bodies, or in spacing or dividing various kinds of work where accuracy and exactness is required.

My device is illustrated in the accompanying drawings and the invention consists in the novel construction arrangement and combination of the various parts that go to make up the device.

In the accompanying drawings, in which similar letters and numerals indicate like parts, Figure 1 is a plan view of a divider embodying my invention; Fig. 2 is an enlarged cross-sectional view of Fig. 1 on the line 2—2 therein; Fig. 3 is a bottom plan view of Fig. 1 the cover being removed; Fig. 4 is a top view of same; Fig. 5 is a plan view of large dial showing a portion of the means for operating the hands thereon; Fig. 6 is a view in cross-section on line 6—6 in Fig. 1 of the inside mechanism and large dial; Fig. 7 is a plan view of the small dial of Fig. 1 and a portion of the operating mechanism; and Fig. 8 is a sectional view on the line 8—8 of Fig. 1 showing the means for operating the hand on the small dial.

The works are inclosed in a case —1— on which the dials —2—, —23— and —27— are secured, as the case may be.

The dials may be graduated as in Fig. 1 to indicate feet and inches or according to the French system of meter or the metric system.

The size of the instrument may be made suitable for the purpose designed, and of any number of fingers.

The divider shown in Figs. 1, 2, 3, 4 and others has a case or covering 20, inclosing the inside frame-work —30— and the top and bottom bridge-portions —31— which span the movable racks —36, 37, 38, 39, 40 and 41—. In the divider shown there are nine fingers —42— being secured to the frame —30— and stationary and —42^a—, —42^b—, 42^c— —42^d—, —42^e—, 42^f—, —42^g—, and —42^h, being secured to their respective movable racks —43—, —37—, —41—, —38—, —44—, —36—, —40—, and —39—. The spindle —22— is turned by the knob or handle —21— and has secured to it a pinion —32— which will move racks —36— and —37—. (It is ½" diameter with 24 teeth.)

The larger pinion —33— will move racks —38— and —39—. The pinion —34— will move —40— and —41— and is ¾" dia. and has 30 teeth. Pinion —35— (¼" dia. with 12 teeth) will move racks —43— and —44—.

The hands —24— and —25— of the dial —23— are secured to the spindle —26— to which is also secured the pinion —45— which is moved or turned by the rack —43—. The hand —28— of the small dial —27— is secured to the spindle —29— to which is also secured the pinion —46— which is turned by the rack —44—. The sleeve —51— of the hand —25— Fig. 6 has at its lower end a small pinion —50— which meshes with and is turned by a big pinion —49— which is secured to the same axis as and turns with the pinion —48— mounted on the lever-arm —52—. The lever arm is held in position by the spring —53— Fig. 5 and the pinion —48— is thus held in mesh with the pinion —47— secured to and operated by the turning of the spindle —29—. The spring —54— Fig. 3 serves to keep the racks and pinions in equal contact.

Looking at Fig. 1 the large hand indicates on the dial ½ inch, that is on the right-hand dial, and the small hand also exactly ½ inch; while on the left-hand dial the hand indicates 1/16 of an inch, which means that the fingers are 1/16 of an inch apart or away from each other and that it is just 8/16 of an inch or one half an inch from one outside finger to the other or between the outside fingers.

If the knob or handle is turned until the fingers assume the position indicated by the dotted lines the fingers then would be exactly one-half of an inch apart and there would be four inches between the outer fingers. The fingers would then point to four as shown by dotted lines on the right-hand dial. It is impossible to move the hands without moving the fingers and the

Madin 287 215-1883 Spac. Dial "
Pedersen 452 614-1891 " "
Hill 686,455-1901 Calipers Dial "
Fuhlmann 725,973 1903 " "

fingers must always be equi-distant from each other, the exact distance being infallibly indicated on the dials down to the dot.

In the accompanying drawings my invention is illustrated. The instruments therein shown differ as to form but all embody the essential features of the invention, whether the instrument be a pair of dividers, compasses, or any other like spacing instrument for use in spacing, dividing, or in the measurement of solid columns or for gaging cylinders. These instruments shown in the drawings are improvements upon all devices used for like purposes, in this, that I provide a graduated dial and hands that are operatively connected, and are moved in unison, with said fingers, to indicate on the dial the measurements required.

The employment of the large hand and the small hand on my dial increases the capacity for measuring, and indicating the measurement, down to the slightest fraction. For instance, the large hand may indicate inches and the small hand the fraction of an inch or the large hand may indicate feet and the small hand inches and fraction thereof, there being a graduated circle for the large hand, and a graduated circle for the small hand.

I am not aware of any spacing instrument which is provided with such a reading device.

My instrument may be used for many other purposes than those above mentioned.

The measurement indicated by the hands on my dial are accurate and may be read rapidly and with facility.

With this description of my invention what I claim is:—

Claim.

In a spacing instrument, a plurality of spacing fingers, and means for separating and drawing said fingers together in unison, in combination with a graduated dial indicating hands adapted to move over the face of said dial, and means operatively connecting the spacing fingers and the hands on the dial, so that they all work together substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GANDOLFO GIAMBRA.

Witnesses:
JOHN F. KERR,
JAMES EGAN.