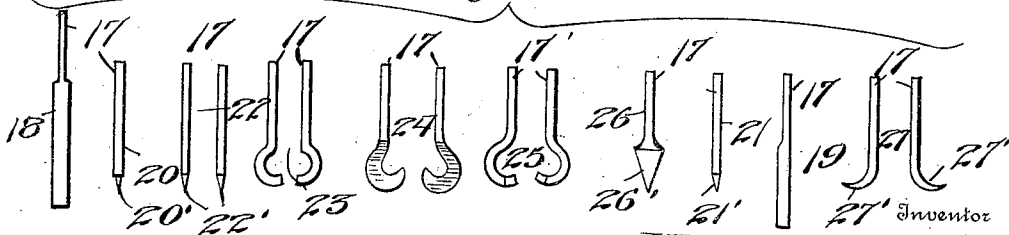
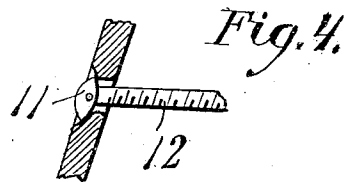
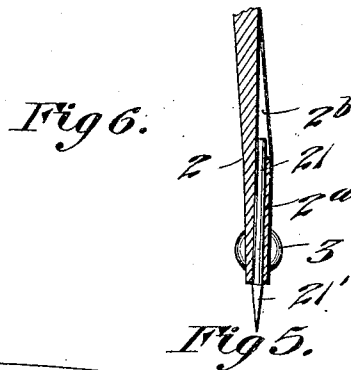
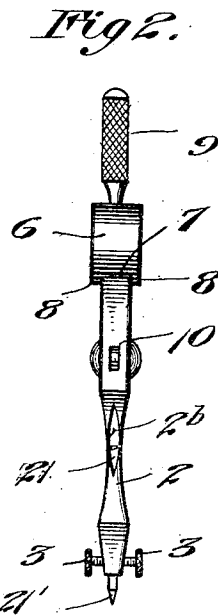
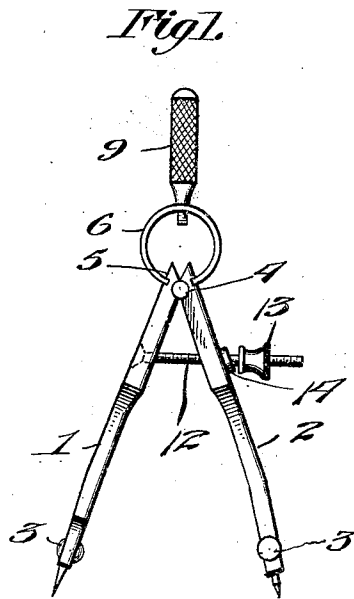
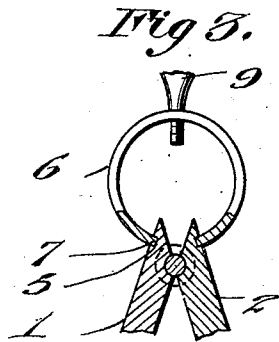


No. 823,364.

PATENTED JUNE 12, 1906.

H. C. RICKHEIT.
DIVIDERS.

APPLICATION FILED APR. 5, 1905.



Witnesses

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DIVIDERS.

No. 823,364.

Specification of Letters Patent.

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Application filed April 5, 1905. Serial No. 253,948.

To all whom it may concern:

Be it known that I, HENRY C. RICKHEIT, a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented new and useful Improvements in Dividers, of which the following is a specification.

This invention relates to certain new and useful improvements in compasses or dividers; and the object of the invention is to provide an instrument of this character which is adapted for a variety of purposes and may be employed with equal facility for scribing or laying off lines on paper, wood, metal, and other materials, thus producing a tool of value to artisans or mechanics needing an all-round instrument in their work.

Another object of the invention is to provide an improved manner of constructing and mounting the expansion-spring and adjusting-stem of the instrument whereby simplicity and inexpensiveness of structure, with better advantages in the use of the instrument, are secured, and, further, to provide a series of points or tools which are interchangeable for use in connection with the instrument to adapt it for a variety of operations.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of a compass or divider embodying the invention. Fig. 2 is a side elevation of the same. Fig. 3 is a detail sectional view showing the connection of the expansion-spring. Fig. 4 is a section through one of the legs, showing the connection of the adjusting-stem therewith. Fig. 5 shows a series of points or tools interchangeable for use in connection with the compass or divider; and Fig. 6 is a section through one of the legs, showing the socket and communicating groove therein.

Referring now more particularly to the drawings, the numerals 1 and 2 represent the legs of the compass or divider, each of which is provided at its lower end with a socket 2^a to receive the point or tool and with a clamping-screw 3 for securing the same therein. As shown, the socket 2^a is inclined to the axis of the leg and communicates at its upper end with a groove or recess 2^b, formed in the outer side of the leg and lying wholly in the plane of the same. This construction provides a socketed tool-holder, which securely holds and braces the tool and diminishes liability

of breakage thereof to a material extent, while permitting ready removal of a wedged or broken tool, as the groove 2^b allows of the convenient application of a suitable implement to force a wedged or broken tool out of the socket. It will be observed that each leg has its upper and lower ends or portions set at an angle to each other, as clearly shown in Fig. 6, and that the socket 2^a extends at an upward and outward inclination to the axis of the lower portion of the leg in which it is formed, while the groove 2^b is tapering in form and is arranged in the outer side of the upper portion of the leg and intersects or connects at its lower or enlarged end with the upper end of the socket, which opens thereinto at its upper end. It will also be observed that the inner wall of the socket lies substantially in the plane of the inner wall of the groove, the advantages of which construction of the parts will be hereinafter stated.

The upper ends of the legs 2 are suitably recessed to receive a pin or stud 4, by which the legs are pivotally connected, and above said recesses the side edges of the legs are formed with transverse grooves or recesses 5 to receive the ends of the bowed or approximately circular expansion-spring 6, whereby the lower end of the legs are spread apart. In order to secure a firm locking connection between the legs and spring, each end of the spring is bifurcated or intermediately notched to form a central locking edge 7 to fit within the recess 5 and oppositely-disposed prongs or short arms 8, which bear against the front and rear sides of the legs, the tension of the spring holding the edge 7 seated in the notch or recess 5, while the prongs or arms 8 prevent the ends of the spring from becoming disconnected from the notches or recesses by lateral or sidewise movement. The upper central portion of the spring is formed with a screw-threaded aperture to receive the reduced threaded end of a finger-piece or stem 9, which is suitably milled or serrated to afford a firm grip.

The leg 1 is provided in its outer side below the pivot 4 with an elongated short longitudinal socket 10, which receives a T-head 11, formed upon one end of a threaded adjusting-stem 12, which extends across the space between the legs and through a smooth-bored opening in the leg 2. On the free end of the stem is an adjusting-nut 13, which bears against a boss or washer 14, arranged

between the same and leg 2, the nut and stem controlling the expansion of the legs 1 and 2 under the action of the spring 6 and permitting the same to be adjusted toward each other against the action of said spring, whereby the lower ends of the legs may be spread the desired distance apart. The inner wall of the socket 10 is curved or rounded and the base of the head 11 correspondingly rounded, so as to permit the head to have sufficient play in said socket to adapt the stem 12 to readily assume various positions to accord with the changed positions of the legs 1 and 2 of the instrument. In order to facilitate this play of the stem 12, the walls of the opening 15 in the leg 1, through which the stem passes, are made of approximately frusto-conical form or caused to converge nearly but not quite to a point, so that the stem may pivot thereon while the inner face of the leg 1 adjacent to said opening is formed with a concavity 16 to allow the stem to have ample freedom of motion in a vertical plane. By this construction the stem is detachably connected with the legs of the instrument and may be quickly applied thereto, so as to permit convenient assemblage of the elements of the instrument, and at the same time the stem is allowed to have sufficient pivotal play to enable the legs 1 and 2 to be adjusted without resistance.

In connection with the instrument I employ a series of interchangeable points or tools adapting the instrument to be used for various operations in drafting and wood, metal, and stone working. Each of the points or tools, which are shown in Fig. 5, is provided with a shank or body portion 17, adapting it to be fitted in the receiving-socket in either one of the legs of the instrument and to be clamped therein by the screw 3, the shanks of all the points or tools corresponding in form, so that they may be interchangeably used. The tools 18 and 19 are provided with flat blades of different form and are used for scribing or marking marble, slate, soapstone, &c. The tools 20 and 21 are formed with pointed ends 20' and 21', respectively, and are used for scribing wood and general drafting purposes, the tool 20 being preferably of steel and the tool 21 of lead, (ordinary pencil graphite or the metal lead, as preferred.) The tools 22 are alike in form and used in pairs and have pointed ends 22', these being of slightly different shape from the pointed end 20' of the tool 20 to adapt the said tools 22, which are made of steel, for more convenient use in marking iron, steel, and other metals. 23 represents outside and inside caliper-tools, and 24 and 25 thread caliper-tools of different form, which may be used in connection with the instrument, the tools 25 permitting the depths of threads to be measured. One of the tools 25 may be used in conjunction with one of

the tools 22 to adapt the instrument for use as hermaphrodite calipers. The tool 26 is formed with a conical or diamond-shaped cutting-point 26' for use in scribing from a drilled-hole lead-point, in which operation it is designed to be used in connection with one of the other tools—namely, the tool 20, one of the tools 22, or the tool 21—thus adapting it for such work upon wooden, stone, or metal objects. Also one of the tools 23 may be used in conjunction with the tool 19 to adapt the instrument for use as keyhole-calipers. The tools 27 have hooked ends 27' and are designed to be used in conjunction to adapt the instrument to be employed as inside thread-calipers. In the several operations in which scribing-work is to be performed it is of course understood that the scribing-tool is mounted upon one of the legs of the instrument and used in conjunction with a pointed pivot-tool mounted upon the other leg of the instrument. By the use of this set of interchangeable points or tools the instrument may be quickly and conveniently adapted for performing a variety of operations in drafting upon paper and other soft drafting materials and in working upon wood, stone, metal, and other hard or comparatively hard substances, thus rendering it of great value to artisans and workmen, particularly where a variety of work of this character is performed by one and the same workman.

From the foregoing description, taken in connection with the accompanying drawings, the construction and mode of operation of the invention will be apparent without a further extended description.

Changes in the form, proportions, and minor details of construction may be made within the scope of the invention without departing from the spirit or sacrificing any of the advantages thereof.

Fig. 6 shows a tool applied to the leg 2, from which it will be seen that the shank of the tool extends upward through the socket and projects a short distance into the base or enlarged portion of the groove 2^b, and thus lies wholly within the groove, so as to be protected from injury. If the shank of the tool should break or wedge within the socket, it may be conveniently forced out of the same by inserting a suitable implement in the groove and exerting pressure or tapping thereon to expel the tool. The implement should be of such form as to readily enter the socket 2^a, so as to follow the shank of the tool downward until the latter is entirely forced out. By disposing the inner end of the wall 2^b in alignment with the inner wall of the socket the said inner wall of the groove is adapted to act as a bearing and guiding portion for the tool-displacing implement, whereby the latter may be held firmly in position at a proper angle until the tool is forced downwardly to a sufficient extent to permit the implement to

enter the socket and to be guided thereby until the tool is displaced.

Having thus described the invention, what is claimed as new is—

5 1. Compasses or dividers provided with pivoted spring-spread legs formed with openings, one of said legs having on its outer side an elongated longitudinal socket and on its inner side a recess, both communicating with
10 its opening, the walls of said socket and recess being frusto-conical shaped to form pivot portions, a stem extending through said openings and having at one end an elongated head seated in said socket, said stem being
15 adapted by the form of the walls of the opening communicating with the socket to have play to vary its position in accordance with the adjustments of the legs, and a nut upon the opposite end of the stem.

20 2. In compasses or dividers, a leg having its upper and lower portions set at an angle, the lower portion being provided with a socket wholly formed therein and inclined to the axis thereof, and a tool having a shank

fitted in said socket, the length of the shank 25 being slightly greater than the length of the socket, whereby the upper end of the shank projects slightly beyond the upper end of the socket, the upper portion of the leg being formed in its outer side with a tapering
30 groove communicating with the upper end of the socket and lying wholly within and with its open side flush with said portion of the leg, said groove receiving the projecting upper end of the tool-shank and having its inner
35 wall lying substantially in the plane of the inner wall of the socket and adapted to serve as a guide and steady rest for an implement inserted in the groove in alinement with the tool, whereby the latter, when broken, may
40 be forced downwardly out of the socket.

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

HENRY C. RICKHEIT.

Witnesses:

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STEPHEN L. UHRIG.