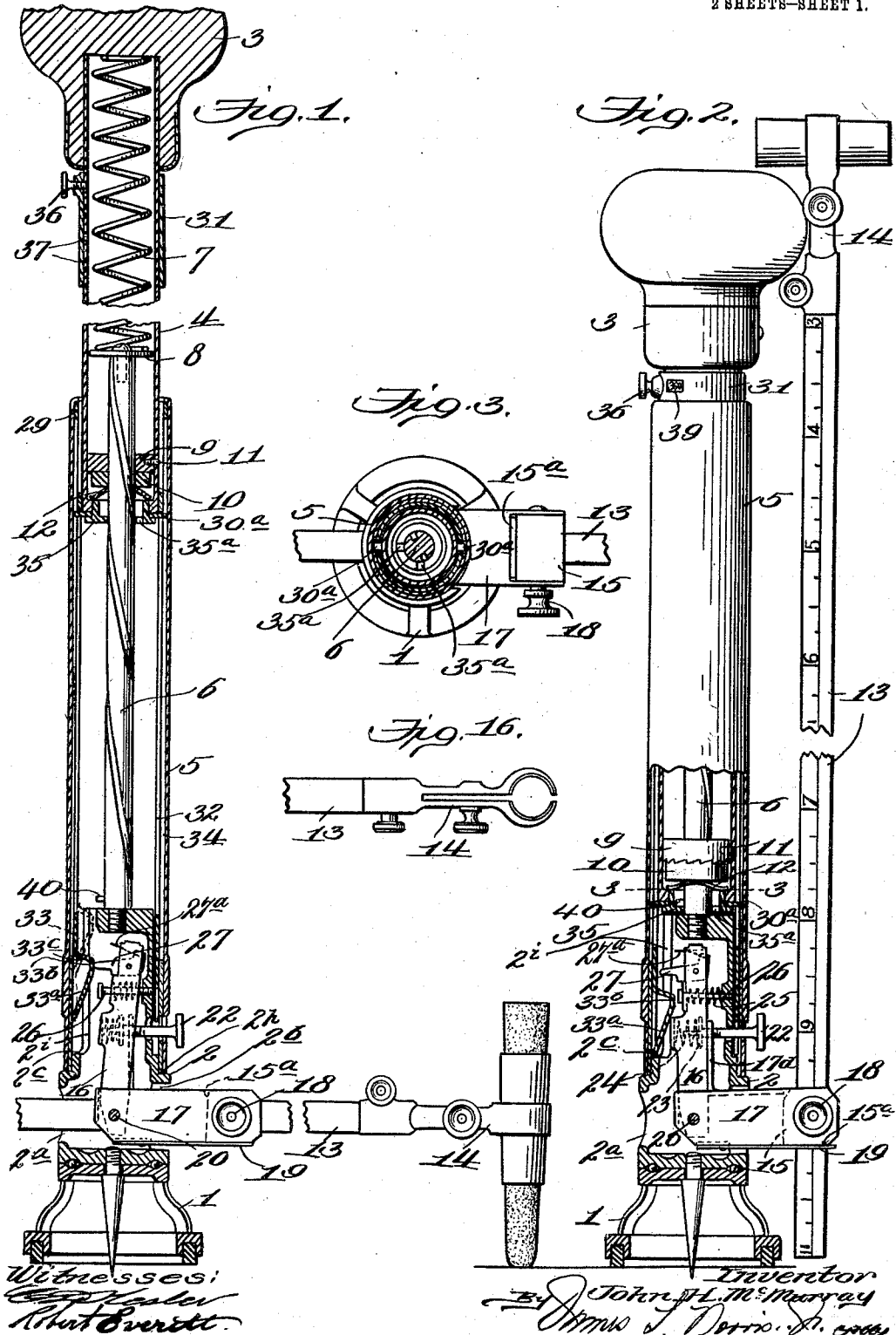


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 INSTRUMENT FOR DRAWING CIRCLES.
 APPLICATION FILED JUNE 11, 1910.

1,005,992.

Patented Oct. 17, 1911.

2 SHEETS-SHEET 1.

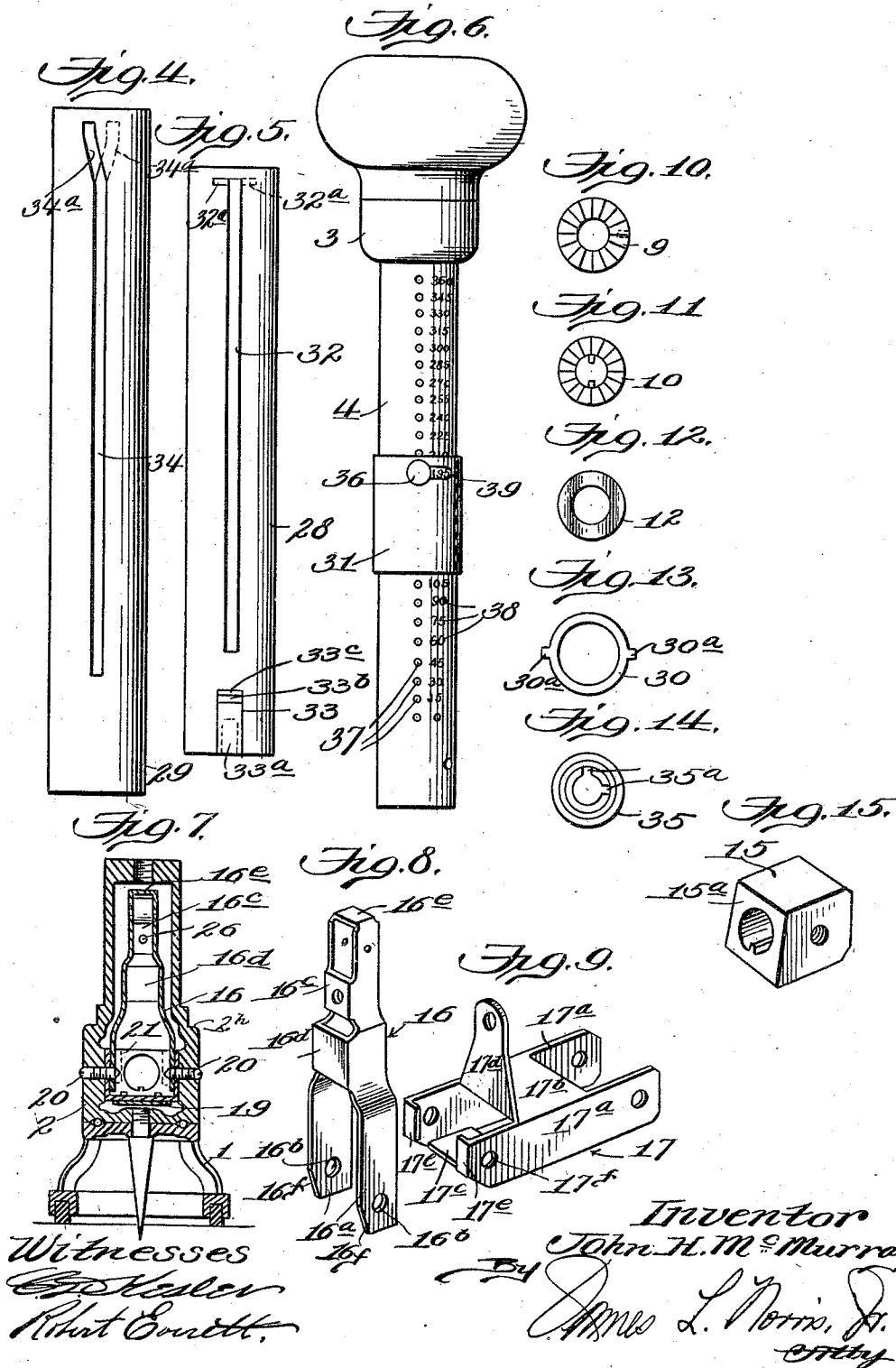


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UNITED STATES PATENT OFFICE.

JOHN H. McMURRAY, OF SCHENECTADY, NEW YORK, ASSIGNOR OF ONE-HALF TO
JOHN T. GORMAN, OF COHOES, NEW YORK.

INSTRUMENT FOR DRAWING CIRCLES.

1,005,992.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed June 11, 1910. Serial No. 566,363.

To all whom it may concern:

Be it known that I, JOHN H. McMURRAY, a citizen of the United States, residing at Schenectady, in the county of Schenectady and State of New York, have invented new and useful Improvements in Instruments for Drawing Circles, of which the following is a specification.

This invention relates to improvements in instruments for drawing circles, and it has more particular reference to an instrument of the type shown in my U. S. Patent No. 951,255, granted March 8, 1910.

Such an instrument comprises a manually operable part, a centering means and a circle scribing means, the operation of the latter being produced mechanically consequent to the operation of the manually operable part.

The objects of the present invention are, first, to improve the operation of the construction referred to by providing means for causing the chalk to bear with a yielding pressure against the blackboard or other surface during the scribing operation and for automatically disengaging the chalk from said surface when the scribing operation has been completed, in order that more regular and finished line work may be produced, and, second, to provide means whereby the disengagement of the chalk from the surface to be marked may be produced when an arc of some predetermined degree has been drawn.

An embodiment of the invention is illustrated in the accompanying drawings, wherein: Figure 1 is a central vertical section of the improved instrument, the parts being disposed as in use. Fig. 2 is a view, part in elevation and part in central vertical section, showing the instrument with the parts disposed as when out of use. Fig. 3 is a horizontal section on the line 3—3 of Fig. 2. Fig. 4 is a detail elevation of a stationary guide sleeve. Fig. 5 is a detail elevation of a movable controlling sleeve. Fig. 6 is a detail elevation showing the handle, the barrel carried thereby and an adjusting device associated with the barrel. Fig. 7 is a detail sectional view of the centering device, the base casting associated therewith, and the operating parts mounted in the casting. Fig. 8 is a detail perspective view of a movable lever frame

by which the chalk is caused to bear against or to be disengaged from the surface to be marked. Fig. 9 is a similar view of a frame which is associated with the chalk carrying beam and which is acted upon by the lever frame shown in Fig. 8. Figs. 10 and 11 are detail face views of cooperating clutch members to be hereinafter specifically referred to. Fig. 12 is a detail plan view of a spring washer associated with one of the clutch members. Fig. 13 is a detail plan view of a ring which cooperates with the sleeves illustrated in Figs. 4 and 5. Fig. 14 is a detail plan view of a bushing to be hereinafter referred to, Fig. 15 is a detail perspective view of the center block. Fig. 16 is a detail plan view of the chalk holder.

Similar characters of reference designate corresponding parts throughout the several views.

The main operating parts are a centering base, as 1; a hollow casting, as 2, rotatably mounted on the base; an axially movable handle, as 3; a barrel, as 4, secured to and movable with the handle; an inclosing sleeve, as 5, secured to and projecting upwardly from the casting 2; a spirally grooved stem, as 6, which is secured to and projects axially from the casting 2 and into the barrel 4; an expansive coil spring, as 7, which is fitted in the barrel 4 and seats against a washer, as 8, provided at the upper end of the stem 6, the tendency of the spring being to hold the handle 3 and barrel 4 in their uppermost positions; cooperating clutch members, as 9 and 10, the member 9 being secured by a screw 11 to the barrel 4 and loosely surrounding the stem 6, and the member 10 being arranged under the member 9, and held by a spring washer 12 normally engaging therewith and provided with projections which engage in the grooves of the stem 6; a horizontally projecting beam, as 13; a chalk holder, as 14, provided at the end of the beam; and a horizontally pivoted center block as 15, through which the beam extends. The foregoing parts are shown and described in detail in my patent referred to, and for this reason the above general recital thereof without further description, is deemed sufficient for the purposes of this specification. In this connection, it should be noted that all words of location, such as "verti-

cal", "horizontal", "top", "bottom", etc., as used throughout this description, are not absolute, but are simply used for convenience to designate the relations of the parts as they appear in Figs. 1, 2 and 7.

The remaining description deals with the improvements which form the subject matter of the present invention and which, of course, are associated with the organization generally described above.

The means for causing the chalk to bear with yielding pressure on the surface to be marked and for disengaging the chalk from said surface acts ultimately on the beam 13 and in the preferred embodiment of the invention includes a lever frame, as 16, and a frame, as 17, which is associated with the beam coaxially thereof and which is directly subject to the movements of the lever frame. The frame 17, which is illustrated in detail in Fig. 9, includes vertically disposed side pieces 17^a, upper and lower connecting webs, 17^b and 17^c, a vertical lug 17^d projecting upwardly from the upper connecting web 17^b, and inturned lugs 17^e provided at the inner ends of the side pieces 17^a.

The center block 15 is pivoted by means of screws 18 between the front end portions of the side pieces 17^a and its bore is provided with a longitudinal key or rib which engages in a groove extending longitudinally along the under side of the beam 13, (Fig. 15). This engagement of course prevents the beam from turning in the center block. Said center block also has its normal inner face inclined, as at 15^a, and when the beam is in its folded position, (Fig. 2), the face 15^a is frictionally engaged by a leaf spring as 19 which is secured to the web 17^c and which, in its engagement with the face 15^a tends to maintain the folded relation of the beam. Normally, however, the spring 19 engages the under face of the center block, as shown in Fig. 1. When in this position the beam may be adjusted axially of the center block in order that the radius of the circle or arc may be increased or decreased, as desired. Ordinarily, the rear end portion of the beam projects through the frame 17 and through an opening, as 2^a, at one side of the casting 2, a similar opening as 2^b being provided at the opposite side of the casting and through which the frame 17 projects. The frame 17 is pivotally mounted on screws, as 20, which are tapped through the casting 2, (Fig. 7), and pass through openings, as 17^f, at the inner ends of the side pieces 17^a. The screws 20 also form the pivots for the lever frame 16. The latter includes side pieces, as 16^a, having openings, as 16^b, at the lower ends thereof and through which the screws 20 extend said side pieces being connected by the upper and lower webs 16^c and 16^d and by the top web 16^e. To main-

tain the relation of the parts a spacing block, as 21, is employed. The block 21 has an opening through which the beam 13 is passed, and is positioned between the lower end portions of the side pieces 16^a, being provided with recesses in its side faces to receive the pointed ends of the pivot screws 20. In order to provide for the necessary pivotal play of the lever frame 16 with relation to the frame 17, the edges of the side pieces 16^a at the lower ends of the latter are inclined, as at 16^f.

In relating the frame 16 to the frame 17, mechanical connections are employed and these preferably comprise a stem, as 22, which extends through openings in the sleeve 5 and the casting 2 and in intermediate sleeves to be hereinafter referred to, has threaded engagement in an opening in the lug 17^d, and has an end portion projecting beyond said lug and carrying a disk or washer, as 23; and an expansive coil spring, as 24, which surrounds the projecting end portion of the stem 22, being held in proper relation thereby, and is interposed between the disk or washer 23 and the web 16^d aforesaid. The normal position of the lever frame 16 is shown in Fig. 1 in which case the lever has been moved to the right (the drawings only being considered) by a means to be described, and, through the intermediary of the spring 24, the stem 22 and the lug 17^d, holds the frame 16 in a position wherein the chalk bears with yielding pressure upon the surface to be marked. The degree of this pressure is obviously determined by adjusting the stem 22 to regulate the tension of the spring 24. The other position of the lever frame 16 is shown in Fig. 2. In this case the lever has been moved to the left and in such movement its side pieces 16^a engage the lugs 17^e and thereby rock the frame 17 upwardly so that the chalk is positively lifted from the surface upon which the circle or arc has been drawn. This movement of the lever frame 16 to the left is effected by an expansive coil spring as 25, which is interposed between the web 16^c and an adjacent face of the casting 2 and which is held in proper relation by a stem, as 26, which passes through an opening in the web 16^c and has an end threaded into the casting.

The means for moving the lever frame 16 to the right includes an element which directly engages a dog, as 27, pivoted between the side pieces 16^a near the upper ends thereof and provided with a projecting toe and also with a projecting leaf spring, as 27^a which bears against the top web 16^e and prevents the dog from assuming an inoperative position.

The movement of the lever frame 16 to the right is effected during the initial stage of the downward movement of the barrel 4 and

the movement of the lever frame 16 to the left is effected during the final stage of the downward movement of said barrel while the parts are reset during the final stage of the upward movement of said barrel. These movements of the lever frame are directly consequent to the movements of what, for convenience, has been termed a "controlling" sleeve and which is designated by the numeral 28. The sleeve 28 immediately surrounds the barrel 4 and is axially movable, its movements being in turn controlled by a guide sleeve, as 29, and effected partly by a ring 30 and partly by an arc-determining sleeve, as 31, which is mounted for axial adjustment on the barrel 4. The sleeve 29 is fixedly mounted, being arranged between the sleeve 28 and the sleeve 5, the function of the latter being simply to inclose and protect the operating parts.

By reference to Fig. 1 it will be noted that the sleeves 5 and 29 rest upon a shoulder as 2^a provided at a suitable height in the casting 2 and are fixed to said casting in any suitable manner.

The controlling sleeve 28 is of shorter length than the guide sleeve 29 and its axial movement is with respect to the latter. Said sleeve 28 is provided with diametrically opposite longitudinal slots, as 32, which terminate short of the upper and lower ends of the sleeve and at their upper ends are provided with lateral extensions, as 32^a. At one side thereof and directly below the adjacent slot 32, the sleeve 28 is provided with an inward projection, as 33, which has three working faces, the lower one, 33^a, being of inward and upward inclination, the intermediate one, 33^b, being perpendicular, and the upper one, 33^c, being of upward and outward inclination and of materially less pitch than the face 33^a. These working faces act at different times on the dog 27 in a manner which will hereinafter appear.

The guide sleeve 29 is provided with diametrically opposite longitudinal slots, as 34, which terminate short of the upper and lower ends of said sleeve, which are always in registry with the slots 32, and which at their upper ends are provided with inclined extensions, as 34^a.

The registering relation of the slots 32 and 34 results from the facts that the sleeve 29 is fixedly assembled and that the sleeve 28 is positively held against rotation with respect to the sleeve 29 through the agency of the projection 33 which is disposed and has movement in a longitudinal guide slot 2¹ formed in the casting 2.

The ring 30 is held against the lower face of the barrel 4 by a flanged bushing, as 35, which is threaded into the upset lower end of said barrel. Said ring is loosely assembled in order that it may have partial rotation and is provided at diametrically op-

posite points with projections, 30^a, which extend through the registering slots 32 and 34.

The arc-determining sleeve 31 surrounds the barrel 4 and is axially adjustable thereon, being held in any desired position by a screw 36 which is threaded through said sleeve and may be engaged in any one of a series of apertures 37 formed in the barrel 4. These apertures are arranged in vertical alinement and at one side of the vertical row of apertures a series of numerical readings, as 38, is arranged. Each aperture is identified by a particular reading and the readings increase by the same increment from the lower to the upper end of the series. Thus the lowermost reading is "0" and from this the readings progress by multiples of fifteen to the uppermost reading which is "360". Each reading is indicative of the degree of the arc which will be produced when the screw 36 is engaged in the correspondingly located aperture. The sleeve 31 is provided adjacent the screw 36 with an opening, as 39, through which the reading adjacent the screw 36 is visible. As shown in Fig. 6, the screw 36 is engaged in the aperture 37 which is identified by the reading "195" and this reading which is visible through the opening 39 of course indicates that the sleeve 31 is positioned for an arc of one hundred and ninety-five degrees.

The operation will be readily apparent from the foregoing description.

When the barrel 4 is in its uppermost position, the controlling sleeve 28 is likewise in its uppermost position, in which case the projection 33 has the position indicated by dotted lines in Fig. 1, and the dog 27 has the position shown in Fig. 2. With the parts disposed in this manner, the projections 30^a of the ring 30 are positioned in the upper ends of the slot extensions 34^a and also in the ends of the slot extensions 32^a. The sleeve 31 is then set for an arc of the degree desired and the operation is as follows. Grasping the handle 3, the barrel 4 is pushed inwardly and as a consequence of this inward movement of the barrel, the casting 2 and therewith the beam 13 are rotated through the intermediary of the spirally grooved stem 6 and the coöperating clutch members 10 and 11. The sleeve 28 is given the first step of its movement coincidently with the initial stage of movement of the barrel 4 and when the first step of the movement of the sleeve 28 is completed the parts are disposed as shown in Fig. 1, wherein the face 33^a of the projection 33 has engaged the toe of the dog 27 and produced the movement of the lever frame 16 to the right with the result previously described, and wherein the face 33^b of the projection 33 is in engagement with the toe of the dog 27, thus holding the lever frame 16 in the

position aforesaid throughout the circle scribing operation. The movement of the sleeve 28 initially with the barrel 4 is continued so long as the projections 30^a of the ring 30 are in the slot extensions 32^a and 34^a aforesaid, but ceases when said projections are brought into alinement with the slots 32 and 34. It will be obvious that during the first stage of movement of the barrel 4, the inclined slot extensions 34^a will cause the projections 30^a to travel from the closed ends of the slot extensions 32^a to the ends thereof which are in alinement with the slots 32 and when the projections 30^a have reached this position they travel, during the rest of the movement of the barrel 4 in the slots 32 and 34. It will also be obvious that so long as the projections 30^a are in the slot extensions 32^a, they will cause the sleeve 28 to move downwardly with the barrel 4 but when said projections come into alinement with the slots 32 and 34 their further movement will be without effect on the sleeve 28 and consequently the latter will remain, throughout the scribing operation, stationary in the position into which it has been moved, that is to say, in the position shown in full lines in Fig. 1. It will also be apparent that the degree of the arc is directly proportionate to the degree of movement of the barrel 4 and that, consequently, by limiting the movement of the barrel 4, a corresponding limitation is put upon the degree of the arc to be produced. This, *inter alia*, is a function of the sleeve 31 which, in accordance with the position in which it is set, limits the movement of the barrel 4 to a greater or less degree.

The sleeve 28, as was stated, remains stationary during the greater portion of the movement of the barrel 4 and throughout the circle scribing operation. Said sleeve, however, has a final step of movement coincidently with the final stage of movement of the barrel 4 and in this final step of movement the sleeve is brought from the position of Fig. 1 into the position of Fig. 2, as will best appear by noting that whereas in Fig. 1 the projection 33 is in engagement with the dog 27 and distant from the shoulder 2^c of the casting 2, in Fig. 2 said projection is below the dog 27, out of engagement therewith and resting against the shoulder 2^c. This final step of movement of the sleeve 28 is directly consequent to the engagement by said sleeve of the sleeve 31, which, in this respect, acts somewhat like a follower. When the sleeve 28 has been moved against the shoulder 2^c in the manner explained, it can move no farther and therefore it prevents further inward movement of the barrel 4 through the intermediary of the sleeve 31. During the final step of movement of the sleeve 28, the projection 33 clears the dog 27 and at this time the spring

25 acts to move the lever frame 16 to the right, the consequence of such movement of the lever frame being that the chalk is positively lifted, at the completion of the arc, from the surface upon which the arc has been drawn. The advantage of this action will be readily apparent when it is considered that ordinarily the chalk is the last part of the instrument to leave the surface upon which the arc has been drawn and consequently always leaves a heavy dot or irregular mark at the end of the arc which not only detracts from the finish of the line work, but, in the case of demonstrations of involved geometrical theorems, may seriously affect the accuracy of the demonstration. By causing the disengagement of the chalk from the surface upon which the arc has been drawn prior to the removal of the instrument from said surface, this objection is avoided.

When the pressure on the handle 3 is released the spring 7 forces said handle and therewith the barrel into their uppermost positions and the resetting of the parts is consequent to the upward movement of the barrel and is accomplished first, by the projections 30^a engaging at the ends of the slots 32 and lifting the sleeve 28 to its initial position, coincidently with the last stage of the upward movement of the barrel; and second, by the slot extensions 34^a acting upon the projections 30^a and causing their movement to the closed ends of the slot extensions 32^a continuously with the last portion of the movement of the sleeve 28. During this upward, return movement of the sleeve 28, the face 33^c of the projection 33 engages the dog 27 and rocks the latter on its pivot sufficiently for it to clear said projection and without producing any pivotal movement of the lever frame 16.

The arrangement may be "folded" in order that it may be packed away in a drawer or other receptacle and this relation of the parts is shown in Fig. 2, wherein the beam 13 is positioned practically parallel to the barrel 5, being so held by the spring 19 which then bears upon the face 15^a of the center block, and the barrel 4 is latched in its innermost position. Toward the end of thus latching the barrel 4, the bushing 35 is provided with two recesses, as 35^a (Fig. 14) which project radially from its central opening and are ninety degrees distant from one another, and the stem 6 is provided at its lower end with a laterally projecting pin as 40. The pin 40 passes through either of the recesses 35^a when the barrel is in its lowermost position and said barrel is latched by giving it a slight turn, sufficient to bring a solid part of the bushing 35 under said pin.

The invention is believed to be of considerable novelty within its particular field

and for this reason no specific description herein contained is intended to put any limitation upon the scope of the succeeding claims, which does not inhere in the language thereof.

Having fully described my invention, I claim:

1. An instrument for drawing circles comprising a centering means, a circle scribing means including a chalk carrying member, an actuating means for producing the operation of the circle scribing means and including a manually operated part, and means structurally independent of the centering means and of the manually operated part for rotating the scribing means consequent to the operation of the manually operated part, and means also operable consequent to the operation of the manually operated part for causing a displacement of the chalk carrying member at the completion of an arc whereby the chalk is lifted from the surface upon which the arc has been drawn.

2. An instrument for drawing circles comprising the combination with centering means, circle scribing means including a displaceable chalk carrying member and means operable by pressure directed toward the centering means for simultaneously holding the centering means upon the surface to be marked and for automatically producing the circle scribing operation of the scribing means, of means operable consequent to the operation of the pressure operated means for producing the displacement of the chalk carrying member at the completion of the arc whereby the chalk is lifted from the surface upon which the arc has been drawn.

3. A instrument for drawing circles comprising the combination of a base, a member rotatable thereon, a displaceable beam carried by the member and in turn carrying a scribing point, an axially movable operating element, means for converting the axial movement of the element into rotatory movement of the member, and means operable consequent to the operative movement of the element for producing the displacement of the beam at the completion of the scribing operation whereby the scribing point is lifted from the surface upon which the arc has been drawn.

4. An instrument for drawing circles comprising the combination of a base, a member rotatable thereon, a displaceable beam carried by the member and in turn carrying a scribing point, an axially movable operating element, means for converting the axial movement of the element into rotatory movement of the member, means for producing the displacement of the beam at the completion of the scribing operation whereby the scribing point is lifted from the surface upon which the arc has been drawn, and means axially adjustable of the operating

element to engage and operate the last named means consequent to the movement of the operating element.

5. An instrument for drawing circles comprising the combination of a base, a member rotatable thereon, a displaceable beam carried by the member and in turn carrying a scribing point, an axially movable operating element, means for converting the axial movement of the element into rotatory movement of the member, a lever which acts on the beam to produce the displacement thereof, an axially movable member for controlling the positions of the lever, and means associated with the element for producing the axial movement of the second named member consequent to the movement of the element.

6. An instrument for drawing circles comprising a base, a member rotatably mounted thereon, a beam carried by the member and in turn carrying a scribing point, the beam being pivotally mounted, and axially movable operating element, means for converting the axial movement of the element into rotatory movement of the beam, a lever operable to hold the beam in either of two positions on its pivot, a spring for moving the lever in one direction, an axially movable member for moving the lever in an opposite direction and means associated with the axially movable element for producing the movements of the axially movable member into and out of engagement with the lever consequent to the axial movements of the element.

7. An instrument for drawing circles comprising a base, a member rotatably mounted thereon, a beam carried by the member and in turn carrying a scribing point, the beam being pivotally mounted, an axially movable operating barrel, means for converting the axial movement of the barrel into rotatory movement of the beam, a lever operable to hold the beam in either of two positions on its pivot, a spring for moving the lever in one direction, an axially movable member for moving the lever in an opposite direction and having a projection for cooperation with the lever in this respect, the lever having a pivoted dog which is engaged by the projection, the axially movable member being initially disposed with its projection above the dog, means associated with the barrel for producing the first step of movement of the axially movable member coincidently with the initial stage of operative movement of the barrel, whereby the projection is brought into engagement with the dog, said last named means being also operable to reset the axially movable member consequent to the return movement of the barrel, and means also associated with the barrel for producing the final step of movement

of the axially movable member coincidently with the final stage of operative movement of the barrel, whereby the projection is moved out of engagement with the dog and below the same.

8. An instrument for drawing circles comprising a base, a member rotatably mounted thereon, a beam carried by the member and in turn carrying a scribing point, the beam being pivotally mounted, an axially movable operating barrel, means for converting the axial movement of the barrel into rotatory movement of the beam, a lever operable to hold the beam in either of two positions on its pivot, a spring for moving the lever in one direction, an axially movable member for moving the lever in an opposite direction and having a projection for coöperation with the lever in this respect, the lever having a pivoted dog which is engaged by the projection, the axially movable member being initially disposed with its projection above the dog, means associated with the barrel for producing the first step of movement of the axially movable member coincidently with the initial stage of operative movement of the barrel, whereby the projection is brought into engagement with the dog, said last named means being also operable to reset the axially movable member consequent to the return movement of the barrel, and means also associated with the barrel for producing the final step of movement of the axially movable member coincidently with the final stage of operative movement of the barrel, whereby the projection is moved out of engagement with the dog and below the same, the last named means consisting of a sleeve which is mounted on the barrel for axial adjustment.

9. An instrument for drawing circles comprising a base, a member rotatably mounted thereon, a beam carried by the member and in turn carrying a scribing point, the beam being pivotally mounted, an axially movable operating barrel, means for converting the axial movement of the barrel into rotatory movement of the beam, a stationary guide sleeve having oppositely located longitudinal slots provided at their upper ends with inclined extensions, an axially movable controlling sleeve arranged within the guide sleeve and having oppositely located longitudinal slots in registry with the slots of the guide sleeve and provided at their upper ends with lateral extensions, a ring rotatably associated with the lower end of the barrel and having oppositely located projections which pass through the slots of the two sleeves, a lever operable to hold the beam in either of two positions on its pivot, a spring for moving the lever in one direction, the controlling sleeve having a projection for causing the movement of the

lever in the opposite direction, and an arc determining device adjustable axially of the barrel and arranged to engage the controlling sleeve and to produce a movement thereof coincidently with the last portion of the axial operative movement of the barrel.

10. An instrument for drawing circles comprising a rotatable beam carrying a scribing point, a centering device for the beam, the latter being pivotally mounted, an axially movable operating element, means for converting the axial movement of the element into rotatory movement of the beam, means for controlling the positions of the beam on its pivot and including a part which is movable during the initial stage of movement of the operating element to provide for one position of the beam on its pivot and which is movable during the final stage of movement of the operating element to provide for the other position of the beam on its pivot, and means operable consequent to the movement of the operating element to produce the aforesaid movements of said part.

11. An instrument for drawing circles comprising a rotatable beam carrying a scribing point, a centering device for the beam, the latter being pivotally mounted, a spring for causing the beam to assume one position on its pivot whereby the scribing point is yieldably pressed against the surface to be marked, an axially movable operating element, means for converting the axial movement of the operating element into rotatory movement of the beam, and mechanism operable consequent to the operative movement of the element for putting tension on the spring throughout the scribing operation and for causing the pivotal displacement of the beam at the completion of the scribing operation.

12. An instrument for drawing circles comprising a rotatable beam carrying a scribing point, a centering device for the beam, the latter being pivotally mounted, a spring for causing the beam to assume one position on its pivot whereby the scribing point is yieldably pressed against the surface to be marked, an axially movable operating element, means for converting the axial movement of the operating element into rotatory movement of the beam, and mechanism operable consequent to the operative movement of the element for putting tension on the spring throughout the scribing operation and for causing the pivotal displacement of the beam at the completion of the scribing operation, said mechanism including an adjustable part which serves to determine the degree of the arc to be drawn prior to the pivotal displacement of the beam.

13. An instrument for drawing circles comprising the combination of centering

means, circle scribing means including a dis-
placeable chalk carrying part, a motion con-
verting device for producing the circle scrib-
ing operation of the scribing means and in-
5 cluding an axially movable part and a sta-
tionary part disposed within the axially
movable part, a bushing provided on one of
said parts and formed with recesses, and a
pin carried by the other part and designed
10 to pass through the recesses in the bushing
and to hold the axially movable part in its

innermost position when said axially mov-
able part is given a partial turn subsequent
to the passage of the pin through the re-
cesses.

15

In testimony whereof I have hereunto set
my hand in presence of two subscribing wit-
nesses.

JOHN H. McMURRAY.

Witnesses:

WM. A. LOCKWOOD, Jr.,

HOWARD PLAYER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."