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RETICLE FOR VARIABLE POWER TELESCOPE SIGHTS

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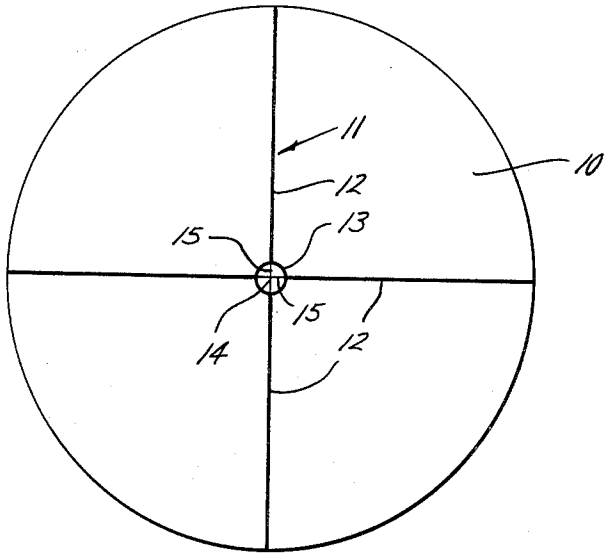

Fig. 1

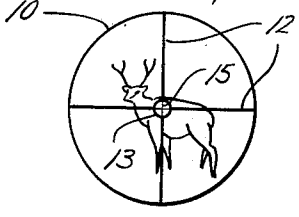

Fig. 2

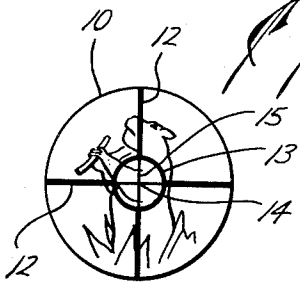

Fig. 3

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RETICLE FOR VARIABLE POWER TELESCOPE SIGHTS

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This invention relates to reticles for telescopic sights for firearms, and more particularly to a reticle especially adapted for a variable power telescopic sight.

As is well-known, in variable power telescopes, changes in magnification change the apparent size of the reticle just as it changes the size of the image of the target. For example, where the reticle is of the conventional crosshair design, as the power is developed, the apparent thickness of the lines defining the reticle is also developed. Such thickening of the reticle lines serves to obstruct the target and prevent accurate aiming. These undesirable conditions are well-known to those skilled in the art.

Accordingly, it is a primary object of the present invention to provide an improved reticle design which will obviate the disadvantages resulting from increases in the magnification of the reticle by increase in the power of the scope.

In accordance with the present invention, a preferred design is a reticle disk of flat transparent character which carries on one side aiming indicia which comprises a pair of lines defining the main cross lines which project toward a point of intersection at the center of the reticle disk. The main cross lines, however, terminate at or adjacent a tiny circle concentric about the center of the reticle disk, this center corresponding to what would be the point of intersection of the main cross lines if the latter extended across the circle. Inside the center circle is a second pair of cross lines intersecting on the common center and radially aligned with the main cross lines. These second cross lines are made to have a line thickness very much less than that of the main cross lines. As a result, when the reticle is viewed at the lowest power of the scope, the center circle may correspond substantially to a tiny dot such as is frequently provided at the intersection of the usual crosshairs, or as an extremely small but definite circle in which the interior cross lines are, however, so fine as to be practically invisible at the lowest power of the scope. As the power of the scope is increased, the area of the small center circle will appear to increase in proportion to the increase in power, as will the interior cross lines, these appearing to become increasingly heavier until the maximum power of the scope is attained, at which point they will appear to be of about the same thickness as that of the main cross lines at the lowest power. Due to the magnification, the center circle will have appeared to expand so as to occupy a substantially increased proportion of the visible area of the reticle disk. In other words, as the power is increased, the center cross lines and their intersection become the primary aiming elements, while the outer or main cross lines, now also of increased thickness, will serve to help direct the eye of the user toward the center.

In accordance with a preferred embodiment of this invention, the main cross lines and the small inner circle will be defined by lines having a thickness such as to subtend about 0.6 minute of angle on the target, while the cross lines inside the center circle will be made to a thickness ranging from about 25% to 50% of the actual thickness of the main cross lines. A preferred thickness for these lines will be about 0.24 minute of angle. The center circle, as indicated, will be made very small but to a specific relation to the amount of target coverage it is desired to provide. For example, the center circle may have a diameter such as to subtend an angle of from about 8 to

20 minutes. One useful diameter will be such as to cover about 10 minutes of angle or about 10 inches at 100 yards from the scope, with the circular line itself, as indicated, having an actual thickness such that it subtends about 0.6 minute of angle.

Other and more specific objects and advantages of this invention will become apparent from the following detailed description of this invention when read in conjunction with the accompanying drawing which illustrates one useful embodiment in accordance with this invention.

In the drawing:

FIG. 1 is a greatly enlarged view of a reticle disk having marked thereon indicia of the design or pattern in accordance with the preferred embodiment of this invention, the various lines being greatly exaggerated for purposes of illustration;

FIG. 2 is a view similar to FIG. 1, the reticle being shown on a somewhat smaller scale than in FIG. 1 and located on a target; and

FIG. 3 is a view similar to FIG. 2, showing the relative dimensions of the indicia of the reticle at a magnification higher than that of FIG. 2.

Referring to the drawing, the reticle comprises a disk 10 constructed of any suitable transparent material, such as glass, the disk being of the usual flat or plano form. It will be understood that the reticle disk will be adapted for mounting in any suitable or conventional manner in the barrel of a variable power telescope sight. Carried on one face of the disk are indicia, designated generally by the numeral 11, defining the desired reticle pattern. These indicia may be applied to the reticle disk by any of the conventional methods, such as etching, printing, photographic methods, or by deposition of metal, all methods understood by those skilled in the art.

The indicia **11** comprise a pair of main cross lines **12—12** arranged on the disk at right angles to each other to intersect at the center of the disk. These lines, however, terminate at or near a small circle **13** concentrically positioned about the center **14** which would normally constitute the intersection of lines **12—12** except for the interruption of lines **12—12** at the line defining circle **13**. A second pair of cross lines **15—15** are marked on the disk inside circle **13** to intersect on center **14** and are disposed in radial alignment with lines **12—12**.

Cross lines **15—15** are made to have a natural thickness considerably less than the natural thickness of the main cross lines **12—12**, and the thickness of lines **15—15** is also made less than that of the line defining circle **13**. The latter will usually have the same line thickness as lines **12—12**.

By way of example as to the relative thicknesses of the various lines, lines **12—12** have a natural thickness such that they cover about 0.6 minute of angle at 100 yards. The line defining circle **13** will have substantially the same thickness. Lines **15—15** will have a thickness generally ranging from about **25%** to **50%** of that of lines **12—12**, and in the preferred embodiment will be about 40% of that of lines **12—12**.

Circle **13** will have a diameter such as to subtend a selected angle. In an exemplary embodiment, the diameter of circle **13** will be such that it will cover about 10 inches at 100 yards.

When a reticle of the kind described is installed in a telescopic sight having a variable magnification from, say, 2½× to 8×, the circle **13**, until magnified, may be of a size such as to compare closely to the dot which is affixed to the intersection of the crosshairs of reticles commonly known as dot reticles or may be of a slightly larger size such as will provide a very small circle or sighting aperture in which the aiming point on the target will be framed. Cross lines **15—15** will be practically invisible at the lowest power. The small center circle and the main cross

lines 12—12 will then serve, at the lower powers, as the principal aiming elements for directing the eye of the user to the center of the reticle and on to the target. As the power of the sight is increased, the diameter of circle 13 will increase proportionately as will the apparent weight or thickness of lines 15, as illustrated in FIG. 3. At maximum power, lines 15 will approach the apparent weight of lines 12—12 at low power and will thus stand out more prominently and with their intersection will become the primary sighting elements of the reticle. By reason of the increased diameter of circle 13 at the magnification, the latter will, for all practical purposes, become the main sighting area of the reticle. Lines 12—12, which will, of course, also increase in thickness by reason of the magnification, will, however, continue to serve to direct the eye of the user toward the central sighting elements and to that extent, will continue to serve their normal sighting function.

It will be seen that by making the internal cross lines 15 much lighter or finer than the main cross line 12, the former will, at full power, provide minimum obstruction to sighting of the target, since at the maximum power they will have attained substantially only the original thickness of the main cross lines.

It will be evident that lines 15—15 may be considered as portions of lines 12—12 lying within circle 13, these inner portions being of natural lighter weight or thickness than the outer portions which are designated as lines 12—12.

It will be understood that various changes and modifications may be made in the details of the illustrative embodiment within the scope of the appended claims, but without departing from the spirit of this invention.

What I claim and desire to secure by Letters Patent is:

1. A reticle for variable power telescope sights, comprising, a transparent disk having a circular area defining substantially the full field of view of said sight, indicia carried on one surface of the disk, said indicia comprising a pair of main cross lines disposed to intersect at the center of said area and extending to the periphery of said area, the point of intersection of said main cross lines being enclosed by a line defining a circle having an area which is relatively minute with respect to the area of said disk, said circle having an inside diameter to subtend an angle of from about 8 to about 20 minutes, the portions of said cross lines lying within said circle having a natural line thickness of from about 25% to about 50% of that of the lines outside said circle.

2. A reticle according to claim 1 wherein the natural thickness of the portions of the main cross lines lying outside said circle and of the line defining said circle is such as to subtend about 0.6 minute of angle, and the natural thickness of the portions of said cross lines inside said circle is such as to subtend about 0.24 minute of angle.

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