(No Model.)

W. LYMAN.

SIGHT FOR FIRE ARMS.

No. 368,598. Patented Aug. 23, 1887.

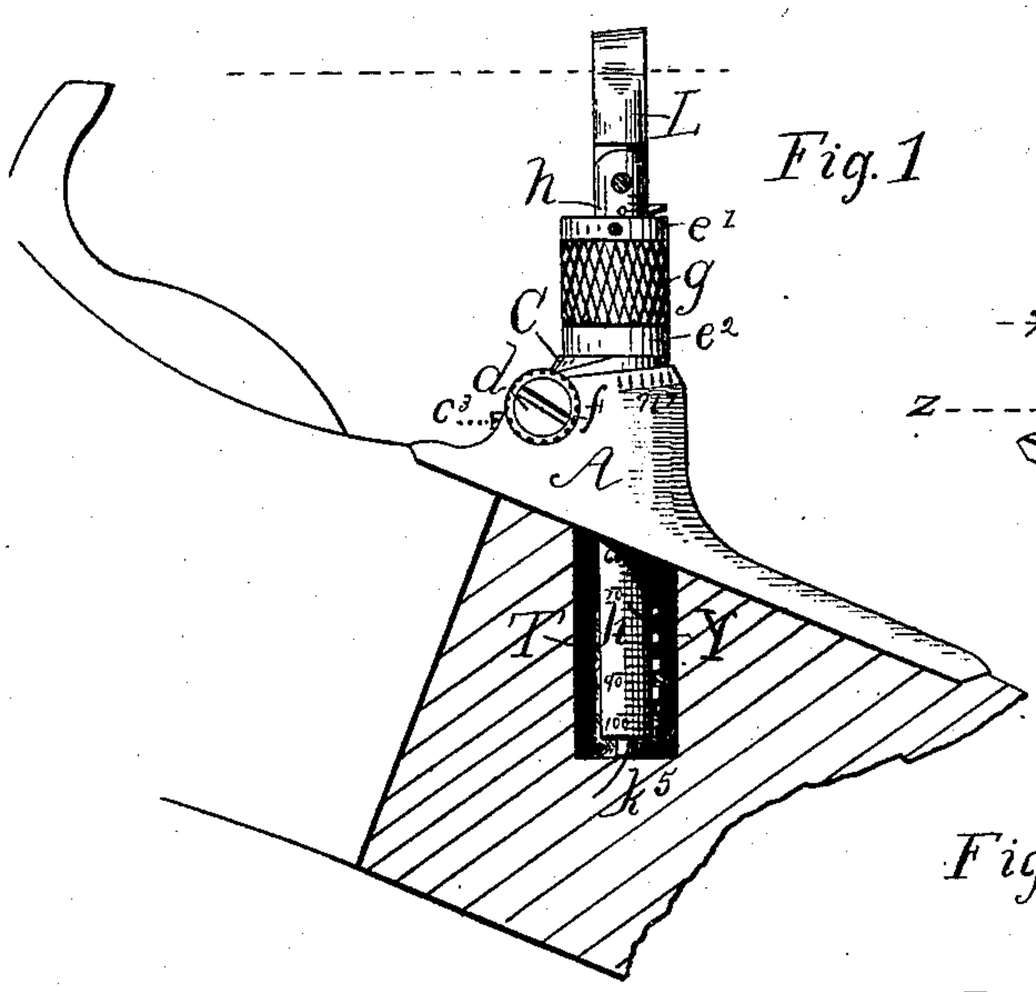

Fig. 1

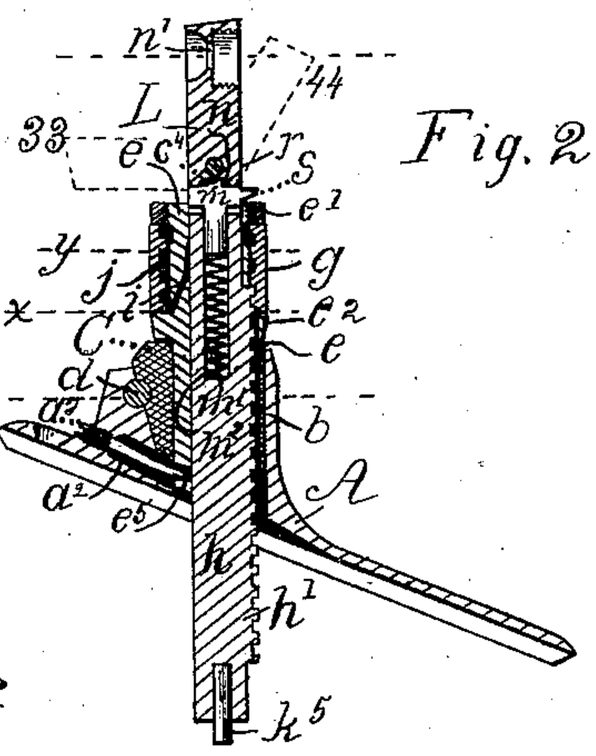

Fig. 2

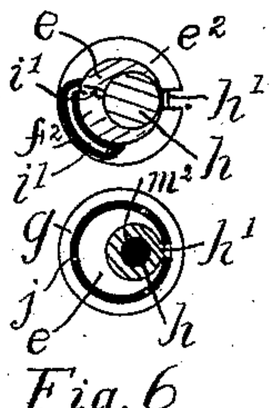

Fig. 3

Fig. 4

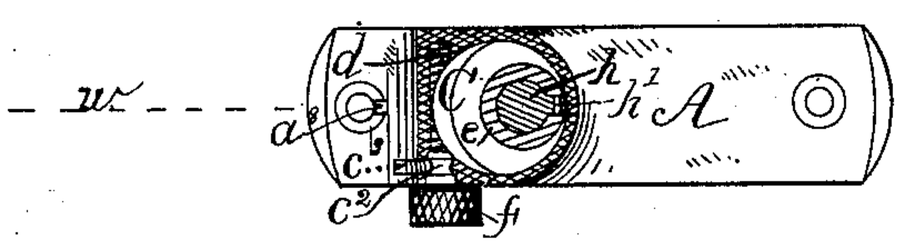

Fig. 5

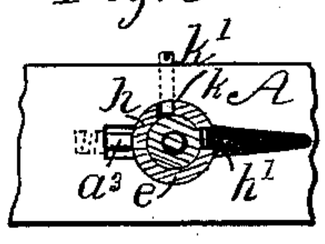

Fig. 6

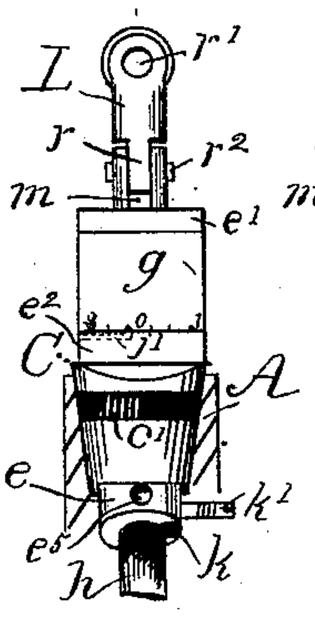

Fig. 7

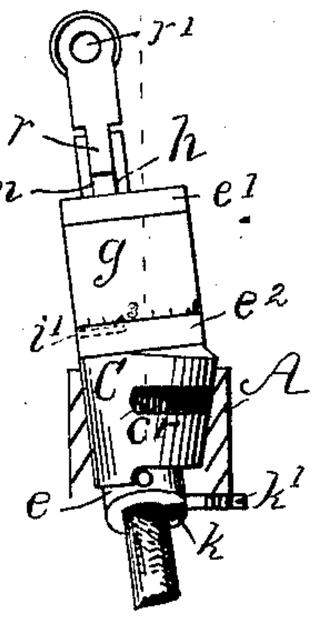

Fig. 8

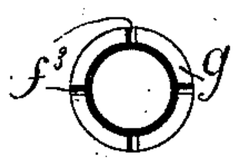

Fig. 9

Fig. 10

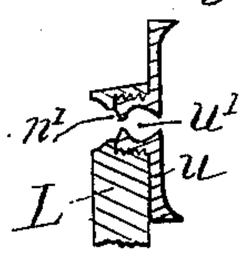

Fig. 11

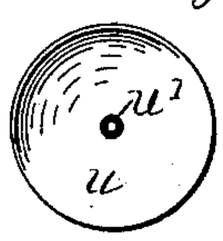

Fig. 12

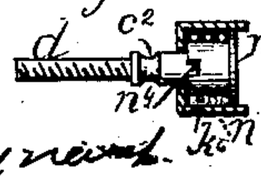

Fig. 13 Fig. 14 Fig. 15

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WILLIAM LYMAN, OF MIDDLEFIELD, CONNECTICUT.

SIGHT FOR FIRE-ARMS.

SPECIFICATION forming part of Letters Patent No. 368,598, dated August 23, 1887.

Application filed April 8, 1887. Serial No. 234,159. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LYMAN, of the town of Middlefield, in the State of Connecticut, have invented new and useful Improvements in Sights for Fire-Arms, of which the following is a specification.

My invention relates to an improved sight for fire arms, and has for its object to provide a sight which is adapted for lateral adjustment to compensate for the deflecting force of the wind on the projectile, and is otherwise suitably constructed for long-range and target shooting, as well as for hunting or short range.

The improvements consist in a novel device for adjusting the sight laterally, in the means for noting the vertical adjustment without reference to the graduations of the scale, in the spring folding joint of the sight-stud, in the means for adjusting the sight-stud at "point-blank," in the novel peep-sight, and in the means for guarding against accidental lateral adjustment of the sight.

In the accompanying drawings, Figure 1 is a side elevation of my improved sight mounted and adjusted at point-blank. Fig. 2 is a vertical section on line *w* through Fig. 5 in the plane of the axis of the barrel. Fig. 3 is a horizontal transverse section on the line *x*, Fig. 2. Fig. 4 is a similar section on the line *y* of same figure. Fig. 5 is a horizontal transverse section on the line *z*, Fig. 2; and Fig. 6 is a view of the under side of the sight. Fig. 7 is a front view of the sight adjusted at the point-blank, and Fig. 8 is a similar view with the sight-arm adjusted laterally. Fig. 9 is an end view of the under side of the vertical adjusting-nut; and Fig. 10 is a view, partly in section, of a modification of the operating-screw. Fig. 11 is a sectional view centrally through the target or cup sight, and Fig. 12 is a front view of Fig. 11. Figs. 13, 14, and 15 show the operating-screw and its clutch.

Referring to the drawings, A represents the base of my improved sight, which is formed with a conical bearing or seat, *b*, extending entirely through it nearly in a vertical plane, with the largest diameter uppermost. A conical part, C, is fitted in the bearing and is perforated through at an angle to the axis of the cone. The perforation extends close to and about parallel with the rear side of the cone, and is correspondingly inclined to the axis thereof, thus forming a conical eccentric. A worm-thread, *c*, is formed on the front side of the cone, extending about half-way around it, and a screw or worm, *d*, is journaled in the base transversely across it, gearing with the worm-thread *c*. The screw is provided with a groove, c^2, near its head, which receives on its under side the point of a horizontal pin, c^3, which holds the screw in place. As the screw is turned the cone is revolved in its seat through about a quarter of a revolution each side of its central position, and the axis of the perforation through the cone, which stands vertical and about at right angles to the barrel when the cone is central, is thus turned in a conical path and dipped or inclined from the vertical plane as the cone is thrown around in either direction, thus being turned to the right or left of the line of the gun-barrel.

The head of the screw is formed with a series of notches or indentations, n^4, at its inner end and with a disk, n^5, at its outer end. A cylindrical sleeve, n^6, just fitting the disk, is arranged upon the head and has at its inner end a series of dogs, *o*, which bear at their points upon the shank of the screw and are adapted to engage with or fit into the notches n^4 in the head of the screw. A spiral spring, k^6, is arranged around the head of the screw inside of the knurled shell and presses between its inner end and the head of the disk. The spring forces the knurled shell out of engagement with the notches in the screw-head, sufficient space being left between the base and the head to allow this. Thus the screw cannot be turned except by drawing the shell outwardly and engaging it with the head of the screw, and when not so engaged it automatically releases itself by action of the spring and prevents the screw from being accidentally turned or operated otherwise than intentionally.

The screw may be made with a conical head and conical clutch-cone adapted to be wedged upon it; but the dog-clutch is preferable.

A cylindrical sleeve, *e*, is fitted in the eccentric cone C, extending above the top of the cone to receive an annular knurled nut, *g*, for the elevating adjustment. A bearing-collar, e^2, is formed on the sleeve and adapted to

bear upon the top of the eccentric cone. The top part of the sleeve is threaded to receive a nut-collar, e', which is adapted to hold the adjusting-nut g in place. The sleeve is splined or slotted throughout its entire length on its rear side and receives a vertical stud or stem, h, which is provided with a rack, h', fitting the slot or spline in the sleeve. The upper part of the sleeve is turned eccentric to the perforation through the sleeve, as shown in Figs. 3 and 4, with its circumference nearly cutting the circumference of the perforation on the rear side, so that the rack projects beyond the sleeve at that point and is engaged by the internal screw-thread, j, on the adjusting-nut g. The nut-collar e' is also splined, so that the rack may pass up through it.

In the front side of the sleeve, above the stationary collar e^2, is a perforation, i, extending diagonally through to the interior of the perforation through the sleeve. A groove, f^2, is countersunk in the upper side of the collar e^2, joining at one end the perforation i. A spring-wire, i', is inserted in the perforation, bearing against the front side of the stud h, and is bent around to fit in the groove f^2 and bear against the lower side of the nut g. This spring thus steadies the stud in its bearing in the sleeve and produces sufficient friction upon the adjusting-nut to hold it in place and prevent it from turning accidentally. The spring is also bent or hooked upward at the end which lies in the groove f^2, and the adjusting-nut g is formed with a series of ratchet-depressions, f^3, which are engaged by the spring-pawl i'. The pawl holds the nut positively when it engages the ratchet-notches and enables the marksman to elevate or depress the sight by feeling the clicks of the pawl as the nut is turned, and without referring to the figures or scale on the nut, or to the height of the stud above the nut-collar, as indicated by the scale V. The internal thread in the nut-collar is a triple thread, and the number of the ratchet-depressions on the nut is four. This construction permits the nut to be set into engagement with the rack, so that one of the notches will come into or nearly into engagement with the pawl at point-blank.

It will be seen that if there was only one thread and one notch the adjusting-nut could not be changed on the stud less than the distance of a convolution of the thread; but by providing a multithread and a series of notches varying in number from the number of the threads the notches may be cut before the device is put together, and the nut may be meshed with the rack so that one of the notches will come sufficiently near to the pawl at point-blank.

In the front side of the lower end of the sleeve is a perforation, a^2, and a screw, a^3, is inserted into the front side of the base, with its point resting in the perforation. The body of the screw is made sufficiently long between its threaded part and its point to act as a spring, and the base is counterbored around the pin, as shown, to give the spring sufficient room to act. The screw-spring is pointed, and the perforation e^5 in the sleeve is so placed that the screw as it enters it draws down upon the sleeve, thus holding both the sleeve and the cone snugly in place. A slot, k, is cut in one side of the sleeve at its end, and a screw, k', is inserted through one side of the base and into the slot to prevent the rotation of the stud and sleeve as the conical eccentric is revolved by the thumb-screw d. When the sight is intended for long-range firing, and consequently projects considerably above the elevating-nut, it is important that the upper part, L, of the sight-stud be hinged to the main part h thereof and adapted to fold down horizontally.

It is also necessary that the folding part shall be so hinged that it will yield each way from the vertical position when brought in contact with a resisting object and spring back into place. To accomplish this I have devised a peculiar spring-joint, which is particularly shown in Fig. 2. The main part h of the stud is slotted at its upper end lengthwise to the barrel, and the part L is provided with a tongue, r, which is received into the slot or groove in the stud and suitably pivoted thereto.

The stud h is perforated axially at its upper end and receives a spiral spring, m', and a T-shaped part, m, is arranged with its stem in the perforation m^2, resting upon the spring, and its head fitted in the slot in the stud and bearing upon the end of the part L. A projection or stop, c^4, is formed at the middle of the T-head, and a thumb-piece projects radially from one end of the head. The lower end of the tongue is filed square across and then cut away at the center to form a recess, n, in which the projection on the top of the T-head plays. The rear point of the end of the tongue engages the projection as the part L is folded back, and prevents it from tipping beyond the position indicated by the dotted lines 4 4, except when the T-head is depressed by pushing down on the thumb-piece S. On the front side, however, the stop projection is cut away to leave only a slight shoulder, which will ordinarily prevent the part L from tipping beyond an inclination equal to the opposite inclination indicated by the dotted lines 4 4. From both of these positions the part L will return to the vertical position, actuated by the spring m; but when it is desired to fold the part L down forward, by pressing sufficiently hard the end of the tongue will slip past the front end of the projection and allow the part L to fold to the position shown in the dotted lines 3 3.

If desired, the position of the T-head may be reversed, so that the thumb-piece will be on the front side of the sight. It is desirable that when the sight is adjusted at point-blank the lower end shall bear against the gun stock or tang, so that the sight may be depressed and stopped at point-blank without reference to the index-scales. The position of the point-blank on the sight must be found

first, and the length of the sight-stud then regulated. To accomplish this I make the sight-stud less than the full length required and drill a small hole in its lower end. Then the sight may readily be adjusted at point-blank and marked. A pin or wire may then be driven in the hole in the lower end of the sight somewhat longer than is needed, and then filed off until it bottoms upon the gun stock or tang when at point-blank. This method permits the point-blank to be first ascertained, and the length of the sight-stud to be afterward regulated to conform to the gun upon which it is placed.

It will be seen that the variation in the sizes of guns will prevent the making of the sight-studs to a certain and standard length.

The sight-aperture *n'* in the upper part of the stud is formed nearly in the axial line of the stud to reduce to a minimum any error resulting from a torsional play of the stud when the parts are ill fitted. From the sight-aperture forward the perforation is funnel-shaped, as shown, and rearward of the aperture the perforation is enlarged and threaded to receive a cupped peep-sight, *u*, having a minute sight-aperture for target or long-range firing. If the aperture in the cup was of the same diameter throughout, the reflection of light along its sides would cause error in sighting, the distance axially through the cup-sight being considerable. I therefore chamber out the cup between its front and rear sides to form a dark chamber, *u'*, having its forward entrance slightly smaller than its rear entrance, thus at the same time locating the sight-aperture nearly in the axis of the stud *h* and wholly preventing any reflection of light along the sides of the passage through the cup-sight.

A cylindrical eccentric may be substituted for the conical eccentric, but in this case the sight-aperture would be moved laterally only in the same degree as the perforation through the eccentric, whereas with the cone the divergence of the sight-aperture from a vertical line is multiplied proportional to its distance from the cone; hence a small cone will produce the same lateral adjustment as a much larger cylinder, and also by means of its taper always fits snugly in its seat.

It will be seen that the pin *k'* prevents the sight-stud *h* from turning on its axis as the cone is rotated, and that therefore the sight-aperture always remains in the same transverse plane in all positions of the cone.

Other means besides the worm and gear may be used to turn the conical eccentric—as, for instance, a spur-gear and pinion or a set-screw engaging a lug on the cone; but the worm-gear is preferable, and gives ample motion to the cone, thus throwing the sight to the right or left and compensating for the deflection of the projectile by the wind. A vertical line is cut on the rear side of the conical eccentric C, and the rear side of the base is graduated at the top, as shown at n^7, to indicate the amount of the adjustment of the wind-gage. The peculiar shape of the base of the sight serves to steady the hold of the marksman in gripping the gun like the ordinary "pistol-grip" on the under side of gun-stocks, as it fits snugly between the thumb and index-finger as the thumb clasps over the stock.

For ordinary short-range firing the sight-stud will be shorter than that shown in the drawings, and need not enter the gun-stock or the tang of the barrel, but at point-blank will just come in contact with the stock at the lower end. The threaded part of the opening through the part L need not be made larger than the sight-aperture, if desired, and the cup-sight will then screw directly into the sight-aperture. Any suitable form of sight may be mounted upon the eccentric for the purpose of a wind-gage, and I do not therefore wish to confine my invention to the combination, with an eccentric, of the particular sight herein described and shown.

I claim as new and desire to secure by Letters Patent—

1. In a wind-gage sight for fire-arms, the combination of a base having a vertical circular seat or bearing and adapted to be secured on the gun-stock, an eccentric bushing or part fitting the bearing and having a sight-post mounted thereon eccentric to the axis of the bearing, and means for turning the eccentric bushing to adjust the sight laterally to the axis of the gun-barrel, substantially as described.

2. In a wind-gage sight for fire-arms, the combination of a base having a vertical conical seat or bearing and adapted to be secured on the gun-stock, a conical eccentric or part fitted to turn in the bearing and carrying a sight-post mounted eccentrically to and at an angle with the axis of the bearing, and an operating-screw for rotating the conical eccentric to adjust the sight laterally to the line of firing, substantially as described.

3. In a wind-gage sight for fire-arms, the combination of a base having a vertical conical seat or bearing and adapted to be secured on the gun-stock, a conical eccentric or part fitted to turn in the bearing, a sleeve journaled in the eccentric and carrying a sight-post mounted eccentrically to and at an angle with the axis of the bearing, an operating-screw for rotating the conical eccentric to adjust the sight laterally to the line of firing, and means, substantially as described, for holding the sleeve stationary with respect to the base and preventing the rotation of the sight-stud as the conical eccentric is oscillated in its seat or bearing, substantially as specified.

4. In a wind-gage sight for fire-arms, the combination of a base having a vertical conical seat or bearing and adapted to be secured on the gun-stock, a conical eccentric or part fitted to turn in the bearing and carrying a sight-post mounted eccentrically to and at an angle with the axis of the bearing, an operating-screw gearing into a worm-thread upon the conical eccentric, and a clutch-collar mounted on the

head of the operating-screw and adapted to be engaged therewith and to be automatically released therefrom when not in use to prevent the accidental derangement of the wind-sight, substantially as specified.

5. In combination, the base A, having a vertical conical seat or bearing, the conical eccentric C, seated in the bearing and having a perforation extending through it at an angle to its axis, and provided with a worm-thread on its circumference, the perforated bushing or sleeve *e*, journaled in the perforation in the conical eccentric, the vertical sight-stud *h*, carrying the sight at its upper end and provided with a lengthwise rack, *h'*, an elevating-nut, *g*, mounted on the upper part of the sleeve and having its threads intermeshing with the teeth of the rack to adjust the sight vertically, and an operating-screw journaled in the base and geared with the conical eccentric, thereby being adapted to turn the cone and oscillate the sight-stud in a conical path to adjust the line of sight laterally, substantially as and for the purpose specified.

6. In a sight for fire-arms, the combination of the elevating-nut *g*, screw-threaded internally and having ratchet-notches in its annular base, the sleeve or bushing *e*, supported in the base, the sight-stud *h*, mounted in the sleeve, and a combined spring and pawl having one end inserted diagonally through the sleeve and adapted to bear upon the sight-stud, and the opposite end hooked and arranged to bear upward against the nut and engage the notches therein, substantially as and for the purpose set forth.

7. In a sight for fire-arms, the combination, with the sight-stud provided with an elevating-rack and a sleeve supporting the stud, of the elevating-nut or screw-sleeve *g*, having an internal multithread and a series of pawl-notches or ratchet-depressions on its annular face varying in number from the number of the threads in the nut, as and for the purpose specified.

8. In a sight for fire-arms having a folding sight-stud hinged above the elevating-nut, the combination of the main lower part of the stud *h*, having a slot in its upper end and an axial perforation joining the slot, the upper or sight portion, L, provided with a tongue, *r*, fitting the slot and pivoted to the stud, and the spring-actuated T-shaped part *m*, having its stem guided in the stud and provided on its upper surface with a stop for limiting the motion of the stud, substantially in the manner and for the purpose specified.

9. In a wind-gage sight for fire-arms, the combination of the base having a vertical conical seat or bearing and adapted to be secured on the gun-stock, a conical eccentric or part fitted to turn in the bearing, an operating-screw for rotating the eccentric in its seat, and a sight post or stud mounted in the conical eccentric at an angle to the axis of the bearing and provided with the stop-pin k^5, inserted in the lower end of the stud, substantially in the manner and for the purpose specified.

10. In a sight for fire-arms, the peep-sight *u*, having its sight-aperture enlarged between the ends or entrances of the same to form a darkened chamber or non-reflecting passage for light through the cup or disk of the sight, as specified.

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Witnesses:
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GEORGE L. BARNES.