April 19, 1955 C. B. WHITE 2,706,522

VENETIAN BLIND

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Fig. 3 Fig. 2 Fig. 1

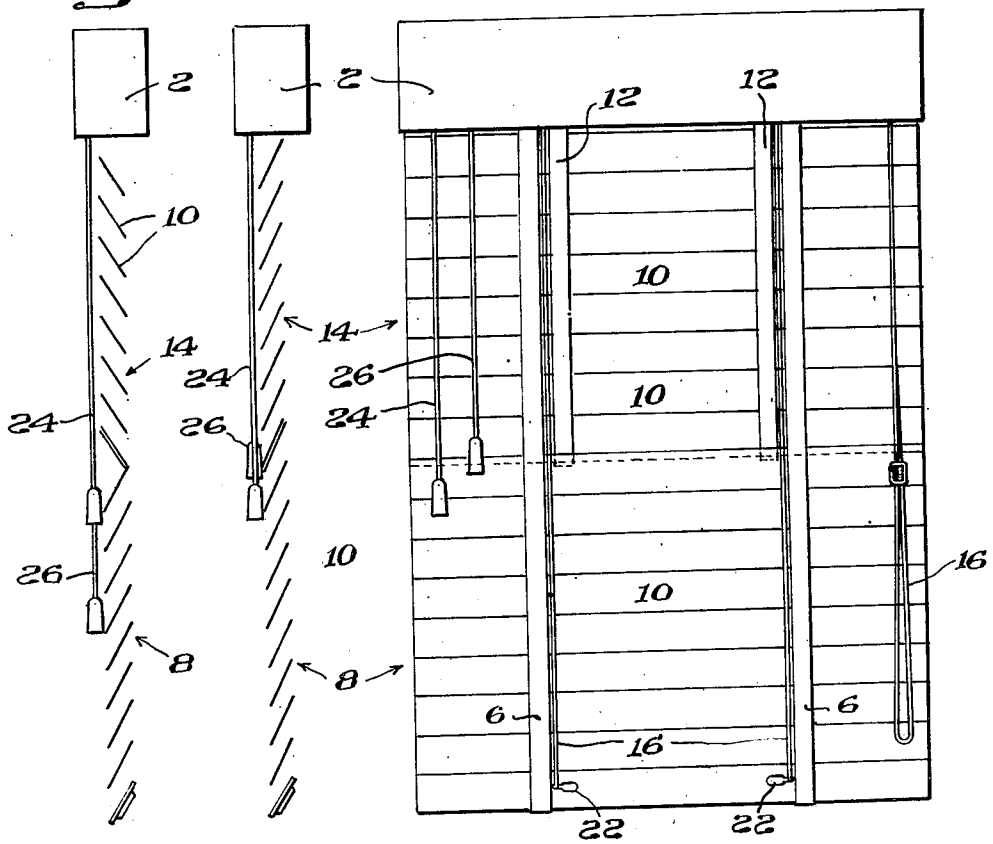


Fig. 7

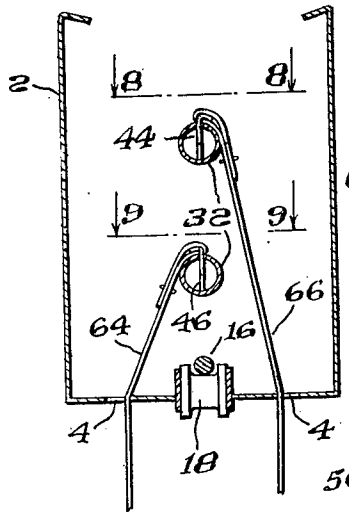


Fig. 8

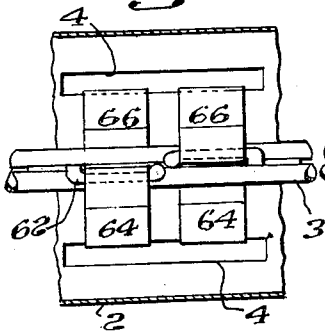


Fig. 9

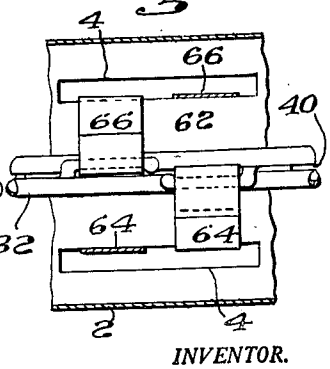
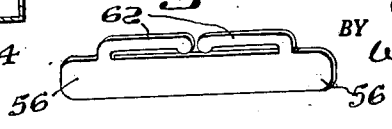


Fig. 10

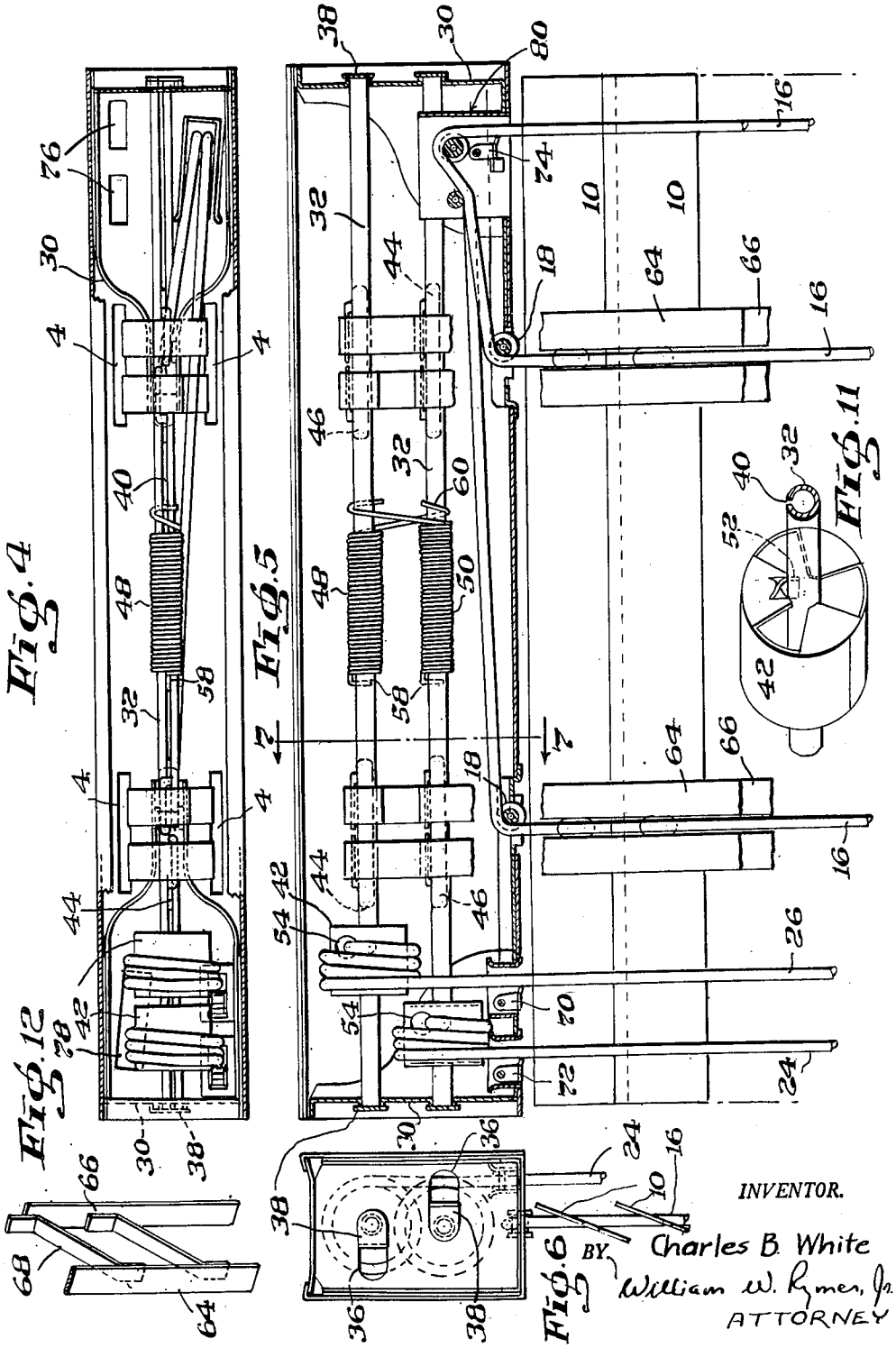


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VENETIAN BLIND

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Application October 14, 1953, Serial No. 385,948

6 Claims. (Cl. 160—115)

This invention relates to improvements in Venetian blinds. More particularly, it provides such blinds, and novel elements thereof, in which slats may be angularly rotated in either direction using a single pull cord, and in which different sets of slats may be adjusted to the same or different angles using a total of only two pull cords for such rotation.

In Venetian blinds heretofore known and used, it has required two pull cords to provide for slat rotation, even though all the slats rotated simultaneously and to the same extent. Often, it is desirable to have a portion of the slats closed, and the remainder open; or to set the said two portions at other angles different from each other. For example, by rotating half the slats to a closed position it is often possible to block out undesirable direct sunlight or gain desired privacy, while the other half of the slats may be rotated to an open position in order to admit light and air.

A further advantage of my new invention is that it makes possible rotating a set of slats to any desired position, using a single pull cord.

One advantage of my invention is that it provides a Venetian blind having only two pull cords for slat rotation, as in Venetian blinds heretofore familiar to the art, but in which the top set of the slats may be rotated to any one desired angle and the bottom set to any other desired angle, using only said two pull cords.

A still further advantage of my invention is that it is simply constructed of inexpensive, durable components, so that it is economical and at the same time sturdy.

Still another advantage is that if desired all the slats may with a single pull be simultaneously rotated to and locked at a single angle.

Generally speaking, my invention concerns one or more (preferably two) shafts journaled within a housing for rotation in a horizontal plane, each such shaft governing the rotation of one set of slats. Each such shaft is at all times urged in one rotational direction by a spring or other suitable means, and may be rotated in the opposite direction by pulling a pull cord secured to and wrapped around a drum keyed to said shaft. The front and back tapes of the tape ladder supporting the slats in said set of slats are each attached to said shaft so that as the front tape is paid out the back tape is taken in and vice versa. Said front and back tapes are offset from each other so that both may be mounted on the same shaft, and according to my new invention are joined by cross-tapes running from the inner edge of the outer tape to the outer edge of the inner tape. A set of slats is set at the desired rotational angle by locking the pull cord against movement.

Other advantages and features of my invention will be apparent from the following drawings and description of a preferred embodiment thereof, in which:

Fig. 1 is a front elevation of a Venetian blind according to my invention;

Fig. 2 is a diagrammatic end view showing all the slats rotated to the same angle;

Fig. 3 is a diagrammatic end view showing the top group of slats rotated to one angle and the bottom group rotated to another angle;

Fig. 4 is a plan view, with the top portion of the housing broken away, of said preferred embodiment;

Fig. 5 is a side elevation, with the front portion of the housing removed, and partially in cross-section, of the upper portion of said preferred embodiment;

Fig. 6 is an end elevation, partially diagrammatic, of said upper portion;

Fig. 7 is a cross-sectional view at 7—7 in Fig. 5;

Fig. 8 is a broken-away plan view at 8—8 of Fig. 7;

Fig. 9 is a similar plan view at 9—9 of Fig. 7;

Fig. 10 is an isometric view of a blank for mounting on the shafts to hold tapes thereto, shown before the tape-holding projections are bent over as in Figs. 8 and 9, and before the ends 56 are crimped;

Fig. 11 is an isometric view showing a spool mounted on a shaft, broken away; and

Fig. 12 is a broken-away isometric view of a portion of a tape ladder for supporting the slats.

Referring to the drawings, there is shown in Fig. 1 a Venetian blind embodying my new invention.

Said Venetian blind includes a housing 2 within which is mounted my novel head, shown in detail in other figures. Dependent from the lower portion of said head and extending through holes 4 in the bottom of the housing 2 are tape ladders 6, supporting a lower set (indicated generally at 8) of slats 10, and tape ladders 12, supporting an upper set (indicated generally at 14) of slats 10.

At the right, depending from the housing 2, is the usual cord 16 for raising and lowering all the slats in a vertical direction. As shown in Fig. 5, this cord extends over the pulleys 18 and 20 in the usual manner and is secured beneath the holes 22 in the bottom slat by properly knotting the ends thereof.

At the left are shown the pull cords 24 and 26, which control the angles to which, respectively, the bottom group of slats 8 and the top group of slats 14 are rotated.

Referring now to Figs. 4, 5, and 7, disclosing in detail the head mechanism of a preferred embodiment, there is shown a housing 2, channel-shaped in cross-section (as is most clearly shown in Fig. 7). Secured within said housing near the opposing ends thereof, by any suitable means, are the end supports 30.

Extending between the end supports 30, and having their ends journalled therein, are the shafts 32. Said end supports are punched out at the holes 36, and the removed material is bent back to form the abutments 38 securing the shafts 32 and 34 against transverse motion.

The upper shaft 32 controls the rotation of the bottom group of slats, indicated generally at 8. On said shaft, which is tubular in cross-section and has a slot 40 extending along its entire length, is mounted a spool 42, two tape-attachment brackets 44 and 46, and a spring 48.

The tape-holding means or spool 42, which is best shown in Fig. 11, may suitably be stamped in a single piece from sheet metal. It is keyed to shaft 32, so as to be rigid against rotational movement relative thereto, by the ear 52 of said spool, which extends into the slot 40. In the periphery of said spool, near one end thereof, is provided a hole 54, shaped more or less like a keyhole. The pull cord 26, which is knotted at its end, is inserted in said hole, the knot (not shown) at the end thereof preventing said pull cord from passing through the narrow portion of the hole 54. Said pull cord 26 is then wound around said spool 42, so that when said pull cord is pulled downward, the shaft 32 is rotated.

The tensioning means or spring 48 functions to continuously urge the shaft 32 toward rotation in the direction opposite to that resulting from downward pull on the cord 26. Said spring is wrapped around the shaft 32, and is secured thereto at one end thereof by the finger 58, which extends into the slot 40 in said shaft. The other end of said spring is secured against rotation with the shaft 32 by extending the same in an arm 60 which may suitably hook around the lower shaft 32.

The tape attachment brackets 44 and 46 are each formed from the sheet metal stamping shown in Fig. 10, by bending the tape-holding ears 62 thereof as shown in Figs. 7, 8, and 9. Said brackets 44 and 46 are mounted within the slots 40 of the shafts 32, and secured therein by sidewise crimping of the ends 56 of said brackets. The direction in which the ears 62 are respectively bent, the same as that taken by the particular tapes dependent from the ear 62 in question, enables the weight of the tapes supported by said ears to assist in holding the brackets 44 and 46 securely in the slots 40.

In the embodiment shown, rotation of the lower group **8** of slats **10** is controlled by the upper shaft **32**. As shown, each of the brackets **44** and **46** carried by said shaft supports a tape ladder which in turn supports one side of said group of slats. Each of said brackets supports on one ear **62** thereof a front tape **64** and on the other ear **62** thereof a back tape **66**. Said front and back tapes fall freely without cross-tapes **68** until the slats **10** of the lower group **8** are reached, whereupon each said slat of said group is supported by a cross-tape **68** extending between a front tape **64** and a back tape **66**.

Referring now to Figs. 4, 5, and 7, the front tape **64** of the left-hand tape ladder dependent from upper shaft **32** extends forwardly of said shaft from the left-hand ear **62** of the bracket **44** and passes downwardly through the left-hand front hole **4** in the housing **2**. The ear **62** around which the upper end of said front tape is secured (as it may suitably be by stapling or sewing the end of said tape so as to form a loop therein) is therefore bent forwardly of the shaft **32**, so that the weight exerted through the said front tape may assist in holding the bracket **44** in place in the slot **40**.

The back tape **66** of said left-hand tape ladder dependent from upper shaft **32** extends rearwardly of said shaft from the right-hand ear **62** of the bracket **44**, and passes downwardly through left-hand rear hole **4**. The right-hand ear **62** is for reasons already explained given a rearwardly direction from the shaft **32**.

The right-hand tape ladder supporting the lower group **8** of slats **10** is similarly supported in the bracket **46**. The only difference is that here the front tape **64** is attached to the right-hand ear **62** and the rear tape **66** to the left-hand ear **62**, so that in the bracket **46** these ears must be, respectively, for reasons set forth above, given a forwardly and a rearwardly direction with respect to the shaft carrying them.

The rotation of the upper set **14** of slats **10** is similarly controlled by the lower shaft **32**, which similarly to the upper shaft **32** carries a spool **42**, a spring **50**, and two tape-attachment brackets **46** and **44**, all serving basically the same function as in connection with the upper shaft **32**. Said lower shaft **32** supports tape ladders **12** which extend only to the bottom of the upper set **14** of slats **10** and includes a cross tape **68** extending between the front tape **64** and the rear tape **66** thereof beneath each slat **10** of said upper set.

The left-hand tape ladder **12** is supported by bracket **46**. As shown, the front tape **64** of said tape ladder is dependent from the right-hand ear of the bracket **46**, which accordingly must extend forwardly of the shaft **32** to accept the loop at the top of said front tape, and falls through the front left-hand hole **4**, to the right of the front tape **64** of the tape ladder **6** supporting the lower slats. The back tape **66** of the left-hand tape ladder **12** depends rearwardly from the rearwardly extending left-hand ear **62** of the bracket **46**, and falls through the left-hand rear hole **4** beside the rear tape of the tape ladder **6** supporting the lower set of slats.

Similarly, the right-hand tape ladder **12** includes a front tape dependent from the forwardly extending left-hand ear **62** of bracket **44** through the right-hand front hole **4**; and a rear tape dependent from the rearwardly extending right-hand ear **62** of said bracket **44** through the right-hand rear hole **4**.

As will appear, the front tapes **64** of the tape ladders **6** supporting the lower set **8** of slats **10** emerge from the housing **2** dependent substantially in front of the rear tapes **66** of the tape ladders **12** supporting the upper set **14** of slats **10**, while the front tapes **64** of said tape ladders **12** depend substantially in front of the rear tapes **66** of the tape ladders **6**.

As described, the front and rear tapes of a particular tape ladder are in each case transversely offset from each other, so that both may be attached to a single bracket **44** or **46**. Accordingly, the cross-tapes **68** extend in each tape ladder from one transverse side of one tape to the other transverse side of the other, depending of course on which direction the offset takes, the purpose being to give the cross-tapes a direction substantially perpendicular to that of the long axis of the slats **10**. Thus, in the left-hand tape ladder **6** and the right-hand tape ladder **12** the cross-tapes **68** extend from the right-hand side of the front tape **64** to the left-hand side of the back tape **66**, as shown particularly in Fig. 12. On the other hand, in the right-hand tape ladder **6** and the left-hand tape ladder **12** the cross-tapes **68** extend from the left-hand side of the front tape **64** to the right-hand side of the back tape **66**.

As stated, each shaft **32** is urged in one rotational direction by the spring **48** or **50** carried by it, and in the other rotational direction by a downward pull on its respective pull cord **26** or **24**. Said pull cords are locked at the desired position, thus setting the slats **10** at the desired angle of rotation, by means of the locks **70** and **72**, respectively, which function in the same manner as the lock **74**, long familiar to the art as a means of preventing vertical movement of the cord controlling lifting and lowering of slats.

As shown, the spools **42** may suitably be of such substantial diameter as to require their being offset transversely from each other, in order to increase ease of movement and lessen the number of turns of cord necessary thereon in order to produce a given amount of rotation.

The end supports **30** may suitably be interchangeable, as in the embodiment shown, with holes **76** for use in mounting the locks **70** and **72** and a hole **78** for mounting the vertical lift subassembly indicated generally at **80**, as required.

In operation, disengagement of the lock **70** enables the spring **48** to rotate the upper shaft, thereby winding in the front tapes **64** of lower slat group tape ladder **6** and paying out the rear tapes **66** of said tape ladder, whereby said tapes are given a vertical movement relative to each other and the slats **10** of lower set **8** supported by cross-tapes **68** of said tape ladder are rotated substantially 180°. To produce relative tape movement, with corresponding slat rotation, in the other direction, it is necessary only to pull the cord **26**.

The slats **10** of upper set **14** may be similarly adjusted to the desired angle of rotation by similar manipulation of lock **72** and cord **24**, which control the tape ladders **12**.

Simultaneous rotation of both upper and lower slats to the same angular position may be achieved by simultaneously grasping the two pull cords **24** and **26** and raising or lowering them together to the same extent. Locking or unlocking of both locks **70** and **72** may be accomplished simultaneously with single motions when the two pull cords are grasped together.

The tapes **64** and **66** may, if desired, be narrower than tapes commonly used in Venetian blinds of ordinary present manufacture, for example, of only half the width of such tapes.

It will thus be apparent that I have provided the art with a new Venetian blind which despite extreme strength and simplicity of construction, and the use of no more pull cords than in the standard construction familiar to the art, enables opening one group of slats while leaving another group closed, or adjusting said groups to two other mutually different angles, or adjusting said groups to any mutually same angle, all with great ease and facility.

It will also be apparent that, using a single shaft and a single tape ladder, full rotation of a Venetian blind is attainable, according to my invention, using a single pull cord. Or, more than two shafts and pull cords and tape ladders could be used to get more than two-way control of slat angles.

I claim:

1. A Venetian blind in which an upper group of slats may be rotated to any desired angle and a lower group of slats may be rotated to any other desired angle, which includes a housing, two shafts rotatably mounted therein, each said shaft being provided with spring means for urging said shaft in one direction and a pull cord cooperating with said shaft for urging said shaft in the opposite direction, a multiplicity of tape ladders dependent from one of said shafts, each said tape ladder including a front tape, a rear tape, and a multiplicity of cross-tapes for supporting the slats of said upper group of slats, a multiplicity of tape ladders dependent from the other of said shafts, each said ladder including a front tape, a rear tape, and a multiplicity of cross-tapes for supporting the slats of said lower group of slats, each said shaft cooperating with said tape ladders dependent therefrom to reel in corresponding tapes thereof and simultaneously reel out the opposing corresponding tapes thereof, whereby said slat-supporting cross-tapes assume different angles, and two locks, one cooperating with one said pull cord and the other cooperating with the other said pull cord where-

by said pull cords and therefore said shafts may be locked against movement.

2. The Venetian blind of claim 1 in which said front tapes and said rear tapes of each said tape ladder are transversely offset with respect to each other and said cross-tapes extend from one transverse side of said front tapes to an opposite transverse side of said rear tapes, whereby said cross-tapes extend in a direction substantially perpendicular to the slats carried thereby.

3. The Venetian blind of claim 2 in which said front tapes and rear tapes are secured to brackets mounted in said shafts, said brackets having ears extending therefrom for carrying tapes, each said ear extending in the same direction as the particular tape dependent therefrom.

4. The Venetian blind of claim 2 in which one said shaft is mounted above the other said shaft.

5. The Venetian blind of claim 4 in which each said pull cord is attached to and wound around a spool mounted on the respective shaft non-rotatably with respect thereto, each said spool being of substantial diameter and mounted offset from the other said spool in the direction of shaft length.

6. The Venetian blind of claim 4 in which each said shaft has dependent therefrom two tape ladders, in which said tape ladders dependent from the upper of said shafts carry said lower group of slats and said tape ladders dependent from the lower of said shafts carry said upper group of slats, and in which said front tapes of said tape ladders supporting said lower group of slats depend substantially in front of said rear tapes of said tape ladders supporting said upper group of slats, and said front tapes of said latter tape ladders depend substantially in front of said rear tapes of said former tape ladders.

References Cited in the file of this patent

UNITED STATES PATENTS

1,957,272	Kuyper	May 1, 1934
2,123,817	Warren	July 12, 1938
2,148,812	Hollingsworth	Feb. 28, 1939
2,388,000	Larson	Oct. 30, 1945
2,405,579	Hunter	Aug. 13, 1946