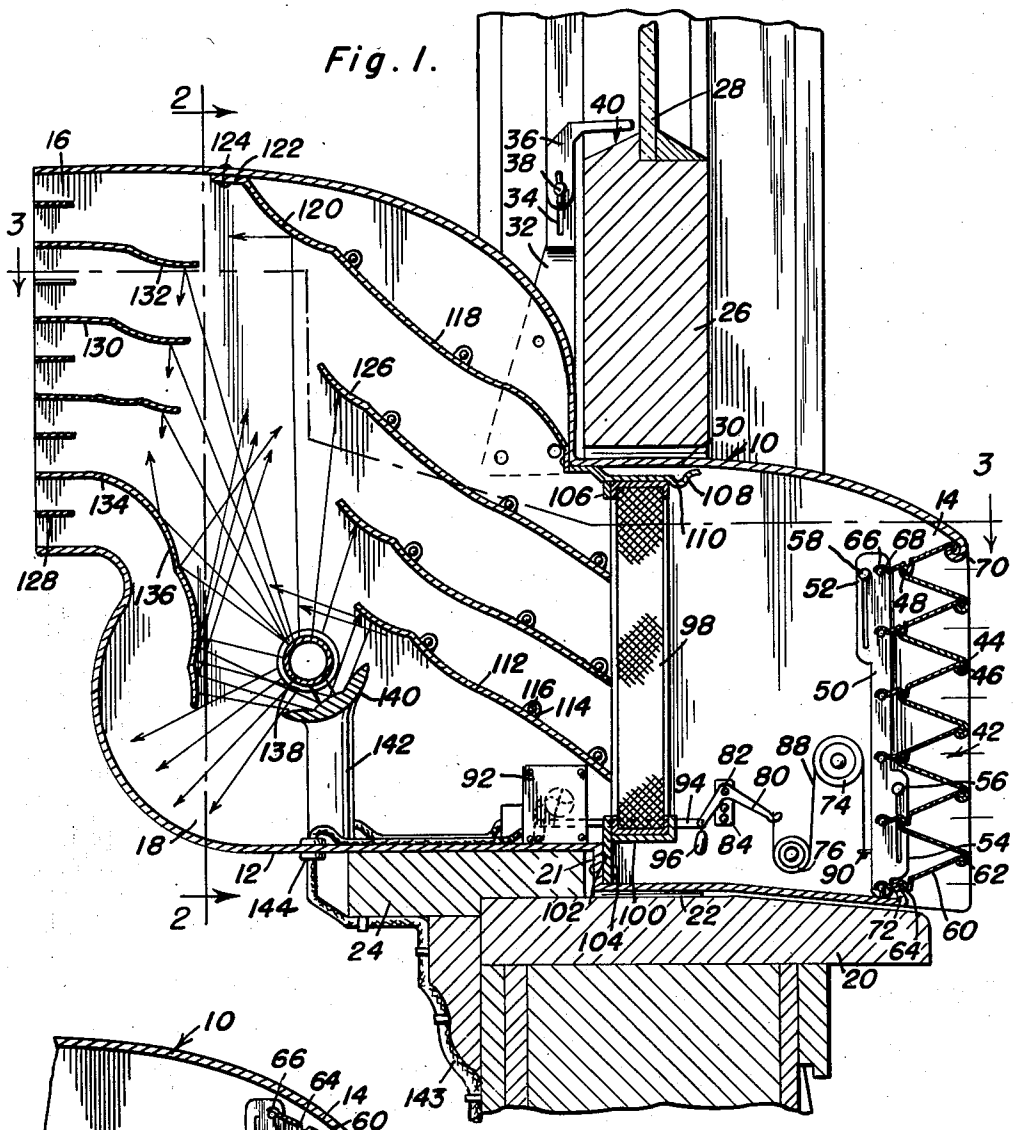
Dec. 2, 1952 B. KNEPPER 2,619,894

AIR CONDITIONING SYSTEM

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Fig. 1.



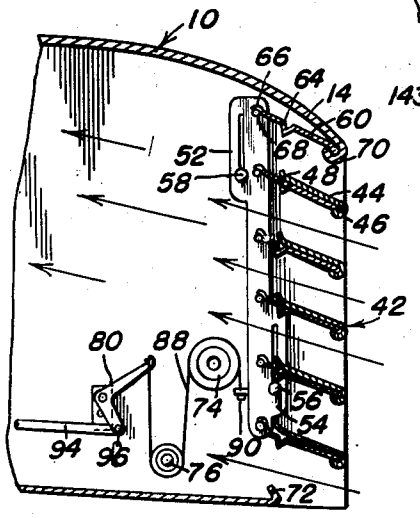


Fig. 4.

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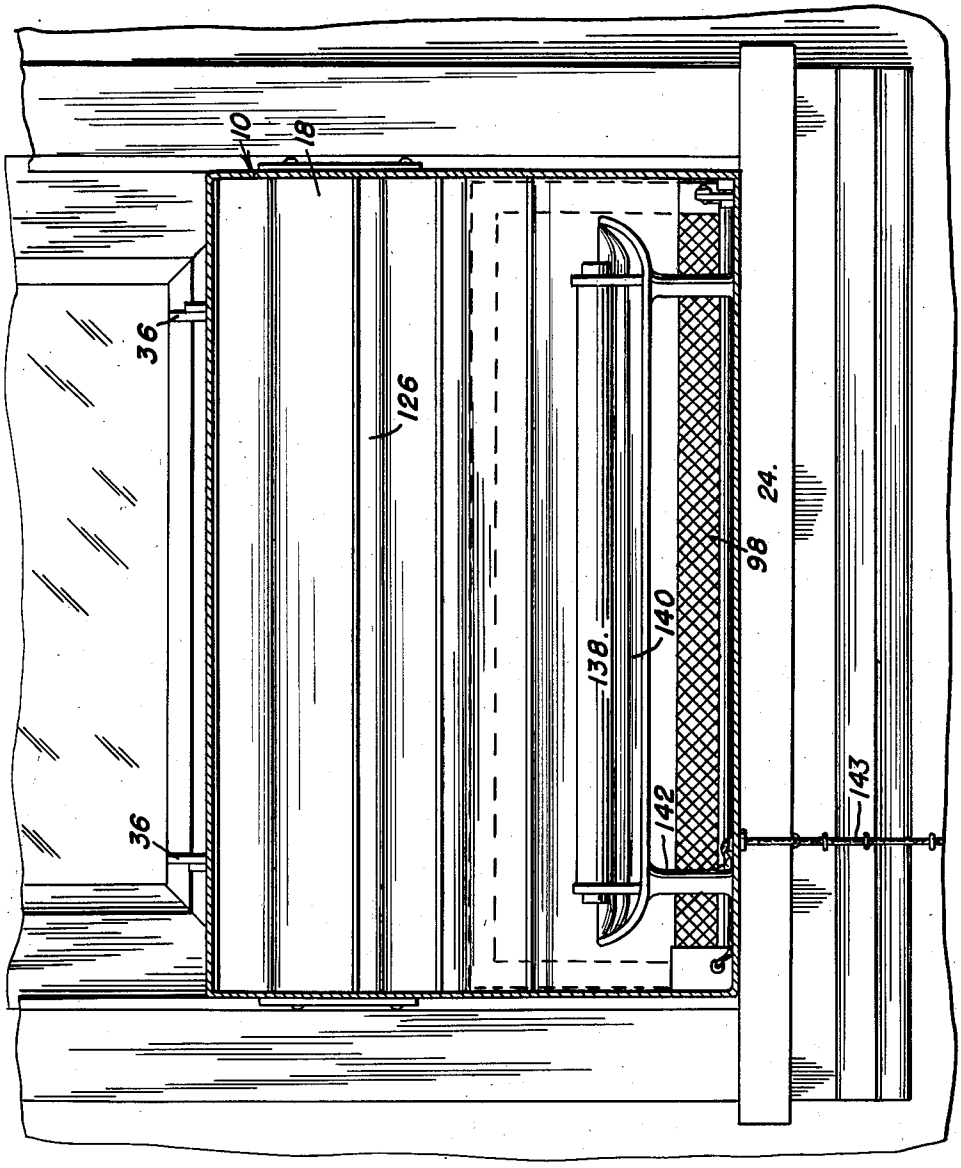


Fig. 2.

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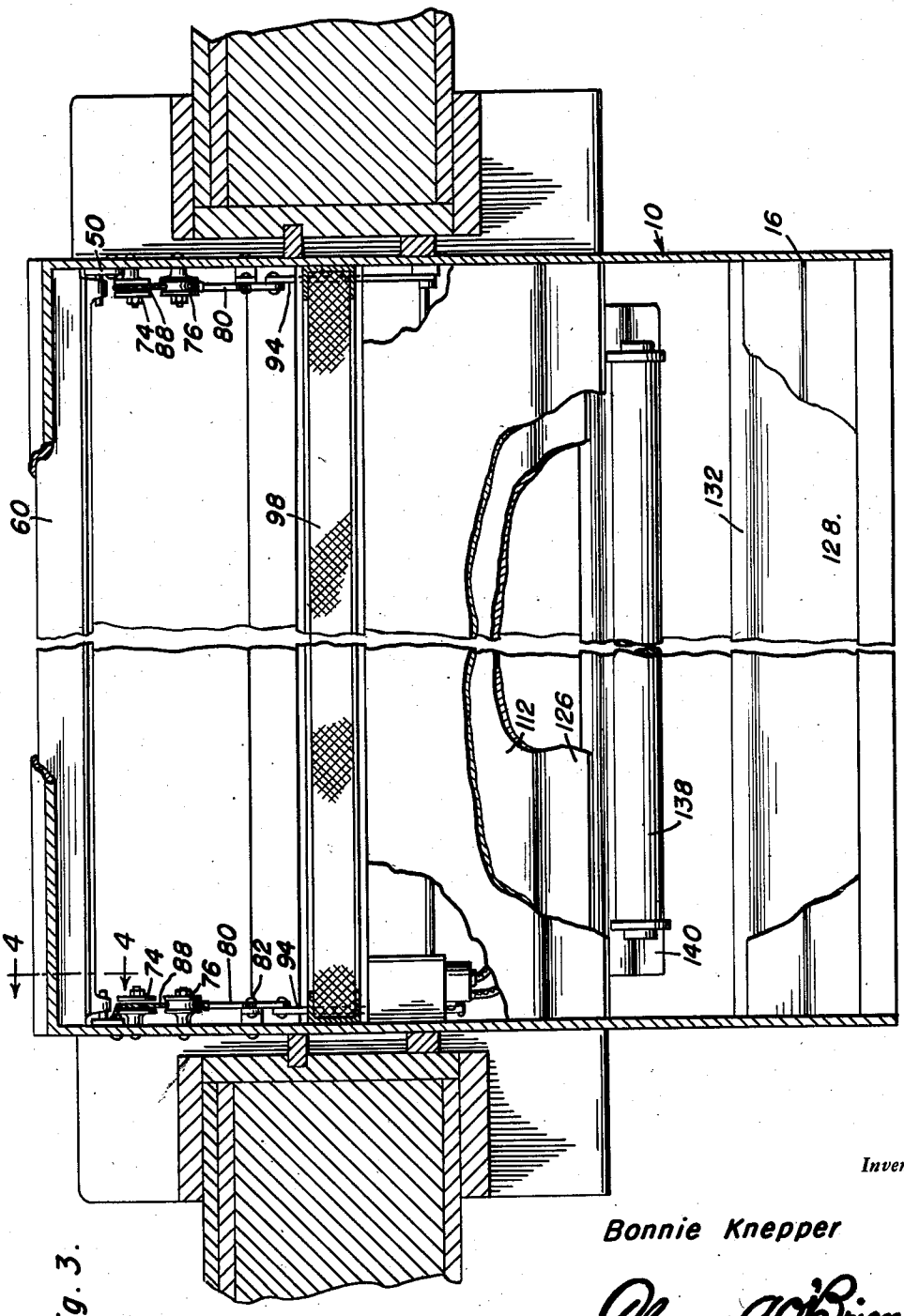


Fig. 3.

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AIR CONDITIONING SYSTEM

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Application June 6, 1949, Serial No. 97,413

2 Claims. (Cl. 98—99.8)

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This invention appertains to an air conditioning unit for buildings, and more particularly to a unit adapted for attachment to the wall or window opening of a building.

The primary object of this invention is to control the movement of air currents passing therethrough from the outside to the inside of a building and to filter and purify the air currents before permitting them to pass into the interior of the building.

Another object of this invention is to reduce the air passing inwardly to the same temperature as the air inside the building and, at the same time, to filter and purify the air.

Another object of this invention is to simplify the attachment of an air conditioning unit, having the above objects, in an opening in a building, such as a window opening or opening especially formed therefor in the wall of the building.

A meritorious feature of this invention resides in the provision of controlled shutters disposed in the inlet opening of the unit, the shutters being actuated by a time-responsive and operated actuating mechanism so as to periodically and sequentially permit controlled amounts of air to pass therethrough.

Another meritorious feature of this invention resides in the provision of a filter unit and contoured channels through which the air must pass in reaching the inner outlet end of the unit, the air, in its passage, being heated and purified by an ultra violet or infra red tube, so that the air is delivered into the interior of the building or living area at the same temperature as the air therein, thereby creating a thorough mixture of the air for economical and healthier living conditions.

These and ancillary objects and additional features are attained by this invention, a preferred embodiment of which is set forth in the following description and illustrated in the accompanying drawings, wherein:

Figure 1 is a longitudinal vertical sectional view of the air conditioning unit, illustrating the same in operative attachment within a conventional window structure;

Figure 2 is a sectional view taken on line 2—2 of Figure 1 and looking in the direction of the arrows;

Figure 3 is a sectional view taken on line 3—3 of Figure 1 and looking in the direction of the arrows; and

Figure 4 is an enlarged detail view taken substantially on line 4—4 of Figure 3.

Referring now more particularly to the drawings, the air conditioning unit, generally designated by the character reference 10, includes a casing 12 which may be formed from suitable sheet material. The casing includes an inlet opening 14 and an outlet opening 16, the openings being offset from each other and being communicated by a connecting passageway 18.

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The casing is designed to be placed within an opening in a building, with the inlet end 14 disposed on the exterior of the building and the outlet end 16 positioned within the building. The casing is illustrated as positioned within a window opening but an opening may be especially formed in the building to accommodate the casing, if desired.

In positioning the casing within the window opening, the casing is seated on the sill 20 with a weather stripping 22 interposed between the bottom of the inlet end of the casing and the sill. The outlet end of the casing seats on the inner sill 24 providing the shoulder 21 in the bottom of casing 12 between the sill 20 and the inner sill 24. The sash 26 of the lower window 28 is lowered until it rests on the top of the inlet end of the casing and a weather strip 30 is secured between the lower end of the sash and the casing. A pair of brackets 32 are secured on the opposing side of the casing and are formed at their upper ends with vertical slots 34. Angular fingers 36 are adjustably disposed in the slots by fastening means 38 and are formed at their lateral extremities with depending prongs 40 adapted to engage in the wood of the sash.

Means is provided for admitting controlled amounts of air through the inlet opening into the passageway 18 and includes a plurality of louvers 42 disposed at the inlet opening and adapted to be periodically opened. The inlet louver unit 42 includes a plurality of fixed slats 44 which are formed at their outer ends with inturned U-shaped bearing members 46. The slats are integrally secured at their opposing sides to the opposite sides of the casing at the inlet opening. The slats 44 are vertically spaced in parallelism and are inclined upwardly and rearwardly, the slats terminating in upturned ends 48. A pair of operating bars 50 are positioned on the opposing sides of the casing and are formed with offset slotted upper and lower ends 52 and 54. Lugs 56 and 58 extend laterally from the wall of the casing and are slidably disposed in the slots in the ends. A plurality of complementary movable slats 60 have their outer ends 62 oscillatably journaled in the U-shaped bearing ends 46 of the fixed slats. The movable slats are formed adjacent their inner ends with V-shaped depressions 64, which are adapted to seat against the up-

turned ends 48 of the fixed slats. The movable slats terminate at their inner ends in a concaved extremity 66 adapted to seat on transverse rods 68 carried by the opposing operating bars 50. Thus, the louver unit, when closed, is in the position as illustrated in Figure 1, with the V-shaped depression 64 of the movable slats pressing against the upturned ends 48 of the fixed slats. When the operating bars are raised, the movable slats are moved upwardly by the transverse rods 68 bearing against the concaved ends 66 of the movable slats and the movable slats are raised into the position illustrated in Figure 4, the movable slats bearing against the under side of the fixed slats. It is to be noted that the upper movable slat is journaled in the inturned upper end 70 of the top of the casing while the bottom of the casing terminates in an upturned end 72 against which the V-shaped depression of the lower movable slat is adapted to seat, so that when the slats are in a closed position, the inlet opening is entirely closed off and no air is allowed to enter therethrough and pass into the passageway.

Means is provided for periodically actuating or raising the operating bars 50 so as to open the unit by raising the movable slats.

In this respect, a pair of pulleys 74 are journaled for rotation on the opposing sides of the casing and a similar pair 76 are rotatably journaled on the opposing sides of the casing in the same horizontal plane, the pulley 76 being spaced inwardly and downwardly from the pulleys 74. A pair of crank arms 80 are pivoted, as at 82, to brackets 84 secured on the opposing sides of the casing. A flexible operating member 88 is secured at one end to the crank and is trained over the pulley, the opposing ends of the member being secured, as at 90, to the lower extremities of the actuating bars.

A conventional electric motor and timer device (Patents 1,935,208; 1,996,375; 2,049,261; 1,977,184; 1,977,185; 1,977,186; 2,353,305) 92 is mounted in the passageway 18 and an actuating arm 94 is controlled thereby and is secured to the crank arm, with a weight 96 depending from the pivoted juncture. Thus, reciprocatory movement of the arm 94 is translated by the crank arm and pulley with the flexible operating member into opening and closing movement of the movable slats.

A screen or filter unit 98 is seated within the casing between the passageway and the inlet opening, the screen unit being seated at its lower end in a U-shaped seat 100 supported by a bracket 102 which is secured, as at 104, to the casing. The upper end of the unit bears against a shoulder 106 depending from a plate 108 which is secured to the upper end of the casing. The filter screen unit 98 can thus easily be removed, since it is held in at its upper end by the catch 108 having the protuberance 110 bearing against the outer edge of the unit, while the inner edge seats against the shoulder 106.

A plurality of vertically spaced baffles 112 are secured at their opposing ends to the opposing sides of the casing, the opposing ends of the baffles being formed with upstanding perforated ears 114 bolted or otherwise affixed, as at 116, to the casing sides. The baffles extend upwardly and inwardly from the screen unit and are directed at their inner ends relative to the outlet opening 16 which is offset from the passageway 18 wherein the baffles are disposed and from the inlet opening. It is to be noted that the passageway 18 is longitudinally aligned with the inlet opening, whereas the outlet opening is offset from the longitudinal axes of the casing defining the passageway and inlet opening. The upper baffle 118 of the set 112 terminates in a concavo-convex end 120 which has a lateral extension 122 secured, as at 124, to the top of the casing adjacent the outlet 16. The lower baffles in the set have similar but smaller concavo-convex ends 126 which are vertically spaced from each other. The under sides of the extensions 126 of the baffles are chrome finished so as to function as reflectors, for a purpose to be described.

A plurality of fixed slats 128 are disposed in a horizontal plane at the outlet opening and are formed in vertical alignment, the slats being spaced vertically from each other along the length of the outlet opening. Interposed between the adjacent slats are baffle plates 130 which are formed with concavo-convex extensions 132, the extensions having their under sides formed as reflector surfaces. A baffle plate 134 extends between the lowest adjacent slats 128 and is formed with a downwardly extending extension plate 136 formed of a series of concavo-convex plates. An ultra violet ray tube or infra red tube 138 is detachably mounted in front of a porcelain receptacle in front of a chrome finished insulated reflector 140, which is carried by supporting members 142 extending vertically from the bottom of the casing. The tube is disposed in the passageway and the rays of the tube are adapted to impinge agains the reflectors, which ahe formed on the ends of the baffles, as above described. The air is heated and purified by the tube, the air being increased to the temperature of the air on the interior of the building so that as the air passes through the baffled passageway, it is heated and is passed through the inlet opening into the interior of the building at the same temperature as the air already in the building.

An electrical conductor 143 extends through the sleeve 144 from the bottom of the casing and supplies the electrical energy for the tube and the electric motor and timer unit 92.

In operation, the timer can be set for one-half or one hour operation at two to ten-minute duration, so that the movable slats are open at predetermined periods and are retained in an open position for a predetermined period. The timer controls the operation of the motor for opening and closing the movable slats and also controls the operation of the tube, so that the tube is only in operation when the air is allowed to pass through the passageway by the open slats.

It is to be especially noted that the air currents entering through the inlet opening will follow a diagonal directional path through the vertically spaced baffles and will pass through the heated zone, coming in contact with the rays from the tube, then be directed through the open fins at the outlet opening.

Having described the invention, what is claimed as new is:

1. An air conditioning unit comprising a casing having an air inlet opening and an air outlet opening, said outlet opening being above the inlet opening, said casing having an inclined passage connecting the openings, vertically spaced baffles in said passage, radiant warming and germicidal means mounted in said casing for conditioning the air in said casing, said warming and germicidal means including an ultra violet radiator in the passage, reflectors carried by the baffles and disposed directly to the radiations of the radiator to reflect the radiations across the passage, mov-

able slats mounted in said air inlet opening for controlling the passage of air therethrough, a timing unit, actuating means operatively connecting said timing unit in controlling relation to said slats, said timing unit periodically moving said slats for opening and closing said air inlet opening for predetermined time intervals.

2. An air conditioning unit comprising a casing having an air inlet opening and an air outlet opening, said outlet opening being above the inlet opening, said casing having an inclined passage connecting the openings, vertically spaced baffles in said passage, radiant warming and germicidal means mounted in said casing for conditioning the air in said casing, said warming and germicidal means including an ultra violet radiator in the passage, reflectors carried by the baffles and disposed directly to the radiations of the radiator to reflect the radiations across the passage, and further vertically spaced baffles in the outlet opening that are spaced from the first mentioned baffles, further reflectors carried by said further baffles that are directly exposed to radiation, from the ultra violet radiator, passing between the first mentioned baffles and the further baffles, movable slats mounted in said air inlet opening for controlling the passage of air therethrough, a timing unit, actuating means operatively connecting said timing unit in controlling relation to said slats, said timing unit periodically moving said slats for opening and closing said air inlet opening for predetermied time intervals.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
302,215	Tucker	July 15, 1884
345,694	Hayes	July 20, 1886
1,000,366	Booraem	Aug. 15, 1911
1,014,058	Goldberg	Jan. 9, 1912
1,217,225	Schueler	Feb. 27, 1917
1,324,973	McQueen	Dec. 16, 1919
1,525,781	Sheppard	Feb. 10, 1925
1,549,440	Breidert	Aug. 11, 1925
1,911,744	Bourne	May 30, 1933
1,916,907	Sargent	July 4, 1933
1,937,483	Shurtleff	Nov. 28, 1933
1,948,239	Redd	Feb. 20, 1934
1,956,829	Frank	May 1, 1934
1,958,342	Johnson	May 8, 1934
2,021,521	Sargent	Nov. 19, 1935
2,044,098	Payne	June 16, 1936
2,158,413	Feinberg	May 16, 1939
2,186,067	Groven	Jan. 9, 1940
2,198,867	Fair et al.	Apr. 30, 1940
2,207,770	Andersen	July 16, 1940
2,230,612	Crise et al.	Feb. 4, 1941
2,234,037	Andeson	Mar. 4, 1941
2,234,771	Moore	Mar. 11, 1941
2,303,254	Bules	Nov. 24, 1942
2,335,627	Wolfert	Nov. 30, 1943
2,362,114	Carver	Nov. 7, 1944
2,456,391	Davies	Dec. 14, 1948
2,502,830	Crise	Apr. 4, 1950
2,560,808	Maccalum	July 17, 1951