

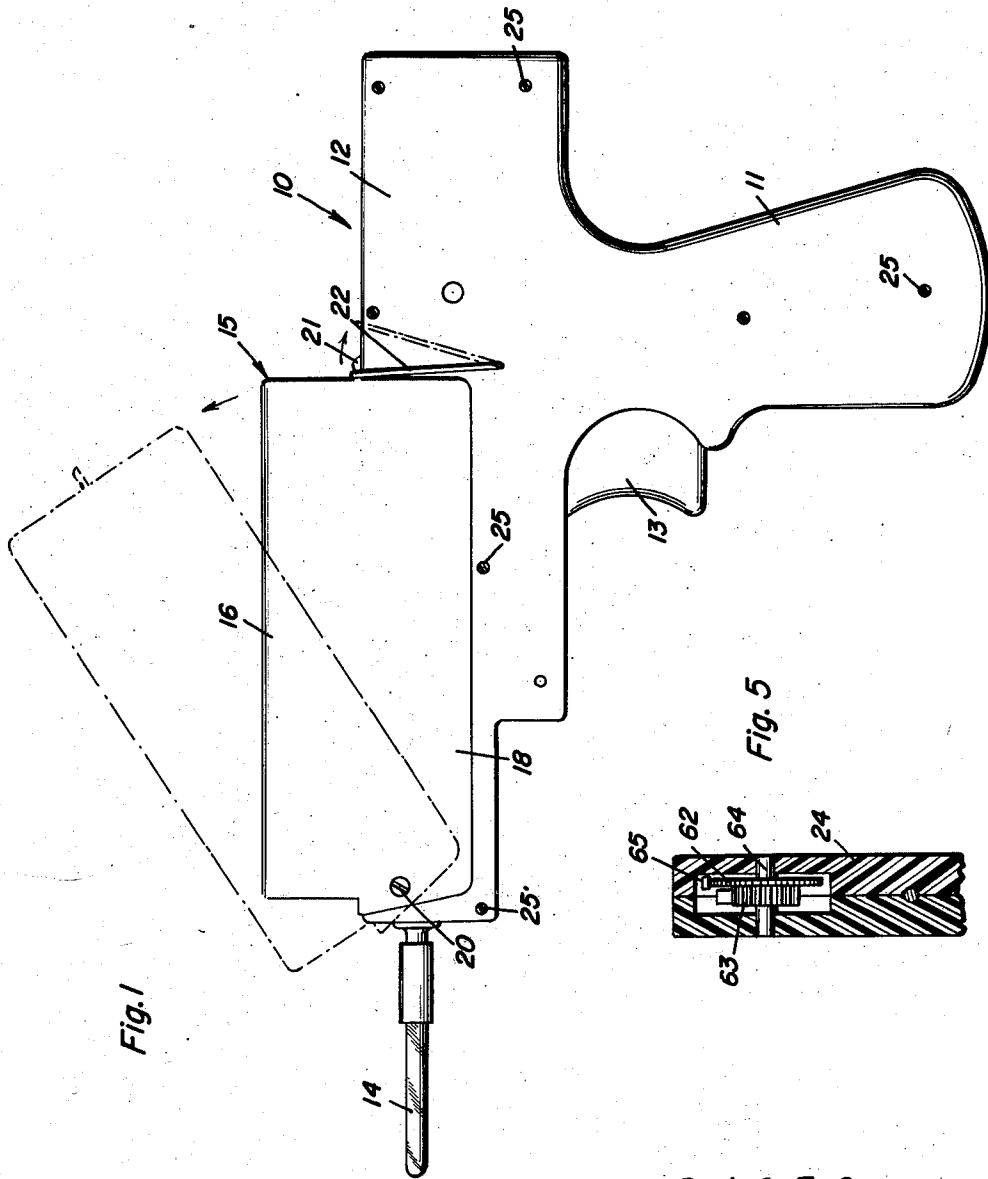
June 28, 1960

P. G. T. GEYER
ARTIFICIAL INSEMINATION GUN

2,942,603

Filed Jan. 8, 1958

2 Sheets-Sheet 1



Paul G. T. Geyer
INVENTOR.

BY *Almonce A. O'Brien*
and Harvey B. Jackson
Attorneys

June 28, 1960

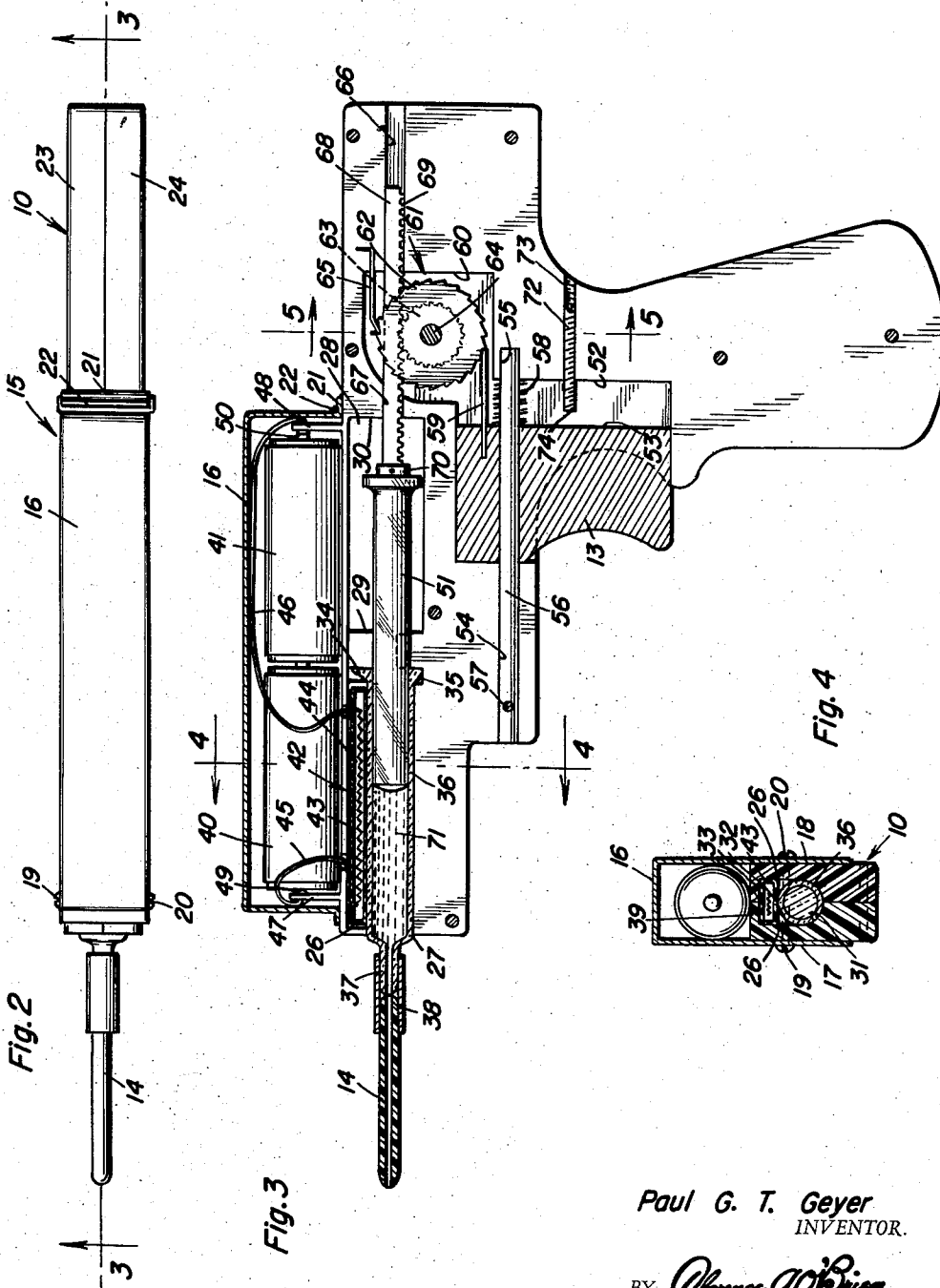
P. G. T. GEYER

2,942,603

ARTIFICIAL INSEMINATION GUN

Filed Jan. 8, 1958

2 Sheets-Sheet 2



Paul G. T. Geyer
INVENTOR.

BY *Alfonse A. O'Brien*
and *Harvey B. Jacobson*
Attorneys

1

2,942,603

ARTIFICIAL INSEMINATION GUN

Paul G. T. Geyer, Little Meadow Road, Guilford, Conn.

Filed Jan. 8, 1958, Ser. No. 707,718

6 Claims. (Cl. 128—235)

This invention relates in general to injection devices and pertains more particularly to improvements in artificial insemination guns especially adapted for use with poultry.

It is the purpose of this invention to provide an artificial insemination gun for use with poultry and, more particularly, it is of primary concern in connection with this invention to provide such a device which is of economical manufacture and which is characterized by its ease of assembly, maintenance and repair, particularly as regards the location and accessibility of component parts thereof.

Another object of this invention is to provide an improved artificial insemination gun consisting of a pair of complementally formed half sections separably joined and preferably constructed of easily moldable material, such as plastics or the like, and in which certain recesses, pockets and the like are formed so that the same register when they are affixed together in a manner to house the component parts of the mechanism.

A further object of this invention is to provide an improved artificial insemination gun of the character described incorporating a novel heating means for the inseminating fluid.

Another object of this invention is to provide an improved artificial insemination gun including a pair of complemental half-sections joined together to form a pistol-shaped housing and in which the parting surfaces of the two half-sections are provided with certain recesses therein so as to permit component portions of the mechanism to be housed within the pockets provided by such recesses when the half sections are joined together, rendering the mechanism easily assembled, repaired and maintained.

Still another object of this invention is to provide improvements in a device of the character described wherein a pistol-shaped housing is formed of complemental half-sections joined along a vertical bisecting plane with such half-section provided each with a transverse opening complemental to each other so as to provide a transverse slot in the intermediate portion in the upper area of the housing or gun and within which slot a plunger mechanism of an associated syringe assembly is normally disposed so as to be easily accessible and visible to an operator of the gun, the complemental half-sections also being provided with complemental recesses intersecting the transverse slot and extending therefrom forwardly to open upon the forward end of the gun and serving as a bore to receive the cartridge of the syringe mechanism and within which bore is also received a heating element in contact with the cartridge.

Another object of this invention is to provide an improved artificial insemination gun in accordance with the preceding paragraph wherein the complemental half-sections are also provided with a rectangular recess and, intersecting therewith, a further recess, the latter of which houses a ratchet wheel and pinion assembly and the former of which guidably and slidably receives a trigger

2

assembly, there further being, in the sections registerable grooves extending through the recesses receiving the ratchet wheel and pinion assembly and serving as a guide for a rack element which extends therefrom into operative contact with the plunger of the syringe device, the trigger being provided with a pawl engageable with the ratchet wheel for actuation thereof as the trigger is manipulated.

Still another object of this invention is to provide an improved artificial insemination gun incorporating a heater element and having associated therewith a battery casing for supplying energy to the heating element.

Another object of this invention is to provide an improved artificial insemination gun incorporating a housing having a transverse slot therethrough and within which slot is operable the plunger mechanism of a syringe device, there being a heater element associated with the cartridge of the syringe mechanism and a battery supply mounted on the upper portion of the gun and with a pivoted shield being mounted so as to enclose the battery source and also cover the openings presented by the transverse slot and yet permit easy access thereto by swinging the shield to an out-of-the-way position.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the device constructed in accordance with this invention and illustrating, in dotted lines, the manner in which the housing shield may be swung to an out-of-the-way position;

Figure 2 is a top plan view of the assembly shown in Figure 1;

Figure 3 is a vertical section taken substantially along the plane of section line 3—3 of Figure 2 and along the parting line between the complemental half-sections forming the gun housing;

Figure 4 is a vertical section taken substantially along the plane of section line 4—4 of Figure 3 and showing details of the heater location and construction; and

Figure 5 is a vertical section taken substantially along the plane of section line 5—5 of Figure 3 and illustrating details of the ratchet wheel and pinion construction.

Referring now more particularly to Figure 1, the reference numeral 10 indicates in general the housing forming the main body portion of the artificial insemination gun and which housing is of gun-shaped configuration including the hand-grip portion 11 and the upper frame portion 12, substantially as shown. The gun is provided with a trigger element 13 which, upon actuation, injects a predetermined quantity of inseminating fluid from the nozzle portion 14 located at the forward upper end of the gun, as shown. Preferably, the housing assembly is formed of commercial plastics or other easily moldable material, for ease and economy of manufacture, and the upper forward portion of the gun is provided with a dust cover or shield indicated generally by the reference character 15 and which includes the cover or cap portion 16 disposed above the gun and the opposite side portions 17 and 18, see particularly Figure 4, which have associated therewith screw elements 19 and 20 so as to pivotally attach the shield to the gun body so as to be swung from the normal full line position as shown in Figure 1 to an out of the way position such as is illustrated in dotted lines in Figure 1. The rearward end of the cover portion 16 is provided with a tongue element 21 extending rearwardly therefrom and which normally rests upon the upper surface of the housing 10 and pivotally attached to the housing is a U-shaped wire

bail 22 having inwardly turned end portions projecting into the body of the housing and pivotally attaching the same thereto so that the same may be swung from the latching position shown in full lines in Figure 1 to the released position shown in dotted lines in Figure 1.

As can be seen most clearly in Figures 1 and 2, the housing 10 is formed of a pair of complemental half-sections 23 and 24 which are similarly formed, and provided as hereinafter set forth, with certain registered recesses, openings and the like forming certain pockets and bores within the housing to receive the component parts of the mechanism forming this invention. These complemental half-sections are joined together with a plurality of screw fastening devices 25 and each is provided with a flat inner face which define the parting surface between the half sections when joined together.

Figure 3 illustrates the manner in which each of the complemental half sections is formed, and in this figure, it is to be noted that each of such sections is provided with a recess 26 which extends and opens at the forward end of the gun at 27 and extends rearwardly therefrom opening into a transverse slot or opening 28 in each section. The transverse opening 28 extends between the opposite end walls 29 and 30 thereof and, see particularly Figure 4, the recess 26 in each half section is provided with an arcuated bottom portion 31 and with tangentially vertical side wall portion 32 extending upwardly to the upper wall surface 33 thereof and when the two half-sections are joined, the recesses 26 form the bore as illustrated in Figure 4 and the openings 28 provide a transverse slot extending from side-to-side of the housing in the upper central region thereof.

Within each of the recesses 26, is formed a notch 34 for receiving the flange portion 35 of a syringe cartridge 36. The syringe cartridge extends forwardly through the bore provided by the two recesses 26 to the forward end of the gun as is shown in Figure 3 and terminates in a nipple portion 37 which is joined to the previously mentioned nozzle 14 by means of a flexible sleeve 38, the purpose of which is to permit flexing of the nozzle 14 relative to the gun to avoid injury to the poultry on which the gun is being used.

The top edge lip 39 (Fig. 4) provided in each complemental half-section by the associated recess 26 is utilized as a supporting base for a pair of battery elements 40 and 41 by means of which a heating element 42 is powered. The heating element includes an outer casing 43 and, disposed therewithin, a resistance unit 44 which is connected at its opposite ends through the flexible conductors 45 and 46 to the batteries 40 and 41 so as to generate heat from the energy supplied by the batteries to maintain the inseminating fluid within the cartridge 36 at the proper temperature. In this respect, it is to be noted that the heating element is disposed in physical contact with the cartridge 36, see particularly Figure 4, and is disposed within the bore provided between the recesses 26.

For the purpose of mounting the batteries 40 and 41, the housing is provided with the upstanding posts 47 and 48 which carry contact members 49 and 50 to which the conductors 45 and 46 are connected. The batteries 40 and 41 are disposed between these posts 47 and 48 and are connected in series as will be readily appreciated.

The previously mentioned cover portion 16 of the shield completely encloses the batteries 40 and 41 and provides a housing therefor at the upper portion of the gun and the side portions 17 and 18 of the shield extend downwardly on opposite sides of the gun and normally cover the opposite sides of the transverse opening or slot therethrough as provided by the openings 28 in each of the complemental half-sections.

Thus, the shield acts as a dust protector to prevent the entrance of foreign material into the working parts of the gun and at the same time provides a ready means by which the syringe mechanism, or at least the plunger

51 thereof may be viewed. Also, the plunger, which projects into the cartridge 36 in a well known manner, may be manipulated by the operator through the transverse opening in the housing as provided for by the transverse openings 28.

Each of the complemental half sections is provided, in the trigger region of the housing, with a generally rectangular recess 52 which has a corner thereof opening exteriorly of the housing and these recesses form a rectangular pocket within a housing to accept the previously mentioned trigger element 13 as will be clearly seen in Figure 3. This trigger element is of generally rectangular configuration to correspond in height to the dimensions of the pocket defined by the recesses 52 but is of less width than such pocket so that the rear edge 53 of the trigger is normally spaced from the opposing surface of the pocket as will be clearly seen. Each of the sections is also provided with a trough 54 which extends horizontally from the forward portion of the gun rearwardly and has an extension 55 on the opposite side of the recesses 52 so as to provide a bore to receive the guide rod 56 which projects through the trigger element 13 and normally retains the same in guided relationship within the housing. The guide rod 56 is preferably pinned as at 57 to the housing half-sections.

The guide rod also serves as a means for locating a compression spring 58 which serves to locate the trigger element 13 in the normal position shown in Figure 3.

The trigger, at the upper end thereof, carries a pawl 59 which extends rearwardly therefrom toward the upper rear corner of the recesses 52 and into a further recess 60 which intersects the recesses 52 in the upper corner portion thereof as is shown. The recesses 60 provide, in the housing, an inner pocket housing the ratchet wheel and pinion assembly indicated generally by the reference character 61.

The assembly 61 includes a ratchet wheel 62 which is engaged by the pawl 59 and which is rotated in step-by-step fashion in response to actuation of the trigger 13. In addition, the assembly 61 includes a pinion 63 (Fig. 5), and both of these elements 62 and 63 are joined together and rotatably received on an axle element 64 which extends through the two complemental half-sections as shown. Since the ratchet wheel 62 is located substantially wholly within the confines of the half-section 24, such half-section carries a stop pawl 65 which normally serves to prevent retrograde rotation of the ratchet wheel 62 as will be readily appreciated.

Each of the half sections is also provided with a further groove 66 which extends into intersecting relationship with the inner recess 60 and has a continuation 67 thereof at the forward side of such recess and which extension intersects with the transverse openings 28 and within the bore provided by these complemental grooves, is a rack element 68 having the downwardly facing teeth 69 which are engaged with the teeth of the pinion 63 and which rack carries at its outer end a head element 70 engaged against the rearward end of the plunger 51 of the syringe mechanism. In this manner, it will be readily apparent that actuation of the trigger mechanism 13 rotates the ratchet wheel and pinion assembly to urge the rack forwardly step-by-step whereby to progressively operate the plunger 51.

In order to control the motion imparted to the plunger 51, and consequently to provide a control of the amount of inseminating fluid 71 dispensed from the cartridge 36, a setscrew 72 is provided between the half-sections 23 and 24, the same being provided with complemental threaded grooves 73 so that the inner end 74 of the setscrew may be located in proper proximity to the rear edge 53 of the trigger element 13 so as to limit its extent of travel.

From the foregoing, it will be readily apparent that the complemental half-sections provide a convenient and economical means of presenting suitable pockets, bores and the like within the housing assembly 10 so as to re-

ceive the various component operating portions of the inseminating gun. As previously discussed, it is possible by swinging the shield 15 out-of-the way to reach through the opposite sides of the housing and manipulate the plunger 51, as desired. In this way, the syringe mechanism may be refilled with inseminating fluid and the operator has at all times means by which he may visually gauge the amount of inseminating fluid left in the syringe mechanism.

In order to change the syringe assembly in the gun, all that is necessary is to remove the shield and then to remove the fastening elements 25 securing the two complementary half-sections together, after which the syringe mechanism is fully exposed and will be permitted of withdrawal from the assembly.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. An artificial insemination gun comprising a pistol-shaped housing composed of a pair of complementary sections removably secured together, each of said sections having a transverse opening therethrough and a first recess intersecting such opening and extending therefrom to and opening upon the forward end of the housing so that the housing is provided with a bore extending inwardly from the forward end thereof and a transverse slot intersecting said bore, each section also having a second recess therein of rectangular configuration having an open corner portion thereof disposed in the trigger region of the housing and each section further having a third recess therein intersecting the second recess diametrically of the open corner of the second recess so that the housing is provided with inner and outer pockets communicating exteriorly thereof in the trigger region of the housing, a generally rectangular trigger slidably disposed in said outer pocket, a ratchet wheel and pinion assembly journaled in said inner pocket, a pawl carried by said trigger engaged with said ratchet wheel for rotating the same, each of said sections having a groove extending through said second recess and intersecting said transverse opening providing a secondary bore in said housing, a rack slidably received in said secondary bore in engagement with said pinion and projecting into said transverse slot, a syringe disposed between said sections including a cartridge received in said first mentioned bore and a plunger reciprocable in said cartridge and extending therefrom into the transverse slot and into contact with said rack, whereby actuation of said trigger will operate said plunger.

2. The assembly defined in and by claim 1 including a second groove in each of said sections and intersecting the upper portion of said second recess and having a continuation thereof on the opposite side of such recess, and a guide rod received in such grooves and extending through said trigger to guide the same.

3. The assembly as defined in and by claim 2 including a compression spring surrounding a portion of said guide

rod and engaged between a wall of said outer recess and the rear edge of said trigger.

4. The assembly as defined in and by claim 1 including a heater element disposed within said first-mentioned bore and engaging said cartridge, a pair of batteries mounted on the upper portion of said gun and electrically connected to said heater element, a shield pivotally mounted on the forward end of said housing and having a cover portion enclosing said batteries and having opposite side portions extending down along the opposite sides of the gun and normally closing the opposite sides of said transverse slot.

5. The assembly defined in and by claim 1 including a setscrew threadedly engaged in said housing and extending inwardly from the rear edge of said outer recess and positionable toward and away from the rear edge of said trigger to limit the movement thereof.

6. An artificial insemination gun comprising a housing having the general shape and appearance of a pistol and embodying a barrel-like body portion with a bore and a lateral pistol grip situated at the proximal end of the body portion, the bore in said barrel being adapted to receive a cartridge of a syringe assembly therein, a plunger slidably mounted in the barrel and with a portion thereof adapted to reciprocate within a cooperating end portion of said cartridge and axially movable therein to expel fluid from the cartridge, a rack bar slidably mounted in the housing and cooperatively engaged with the plunger for actuating the plunger, a rotatably mounted ratchet wheel provided with a pinion, said pinion being operatively engageable with the teeth of said rack bar, said pistol grip being provided in a leading edge thereof with a pocket, trigger operatively and movably mounted in said pocket, said trigger being provided with a pawl and said pawl engaging the teeth of the ratchet wheel to operate the ratchet wheel in a step-by-step manner to consequently operate the pinion and rack bar, spring means co-operable with the trigger and adapted to maintain the trigger in a normal ready-to-squeeze position, and a setscrew accessibly mounted in the pistol grip and accessible through a rear edge of the same and with a portion thereof projecting into cooperative association with said trigger to regulate and check the sliding movement of the trigger relative to the pistol grip, a heater element disposed in said bore and engaging said cartridge, a pair of batteries mounted on the upper portion of said gun and electrically connected to said heater element, a shield pivotally mounted on the forward end of said housing and having a cover portion enclosing said batteries.

References Cited in the file of this patent

UNITED STATES PATENTS

1,250,965	Capwell	Dec. 25, 1917
1,718,596	Smith	June 25, 1929
2,090,644	Seeberger	Aug. 24, 1937
2,316,095	Mead	Apr. 6, 1943
2,472,116	Maynes	June 7, 1949
2,624,338	Moore et al.	Jan. 6, 1953
2,748,767	Wright	June 5, 1956

FOREIGN PATENTS

981,681	France	Jan. 17, 1951
256,011	Great Britain	Aug. 5, 1926