Jan. 22, 1952 G. T. BAKER 2,583,079

LOADING MACHINE

Filed Sept. 28, 1946 3 Sheets-Sheet 1

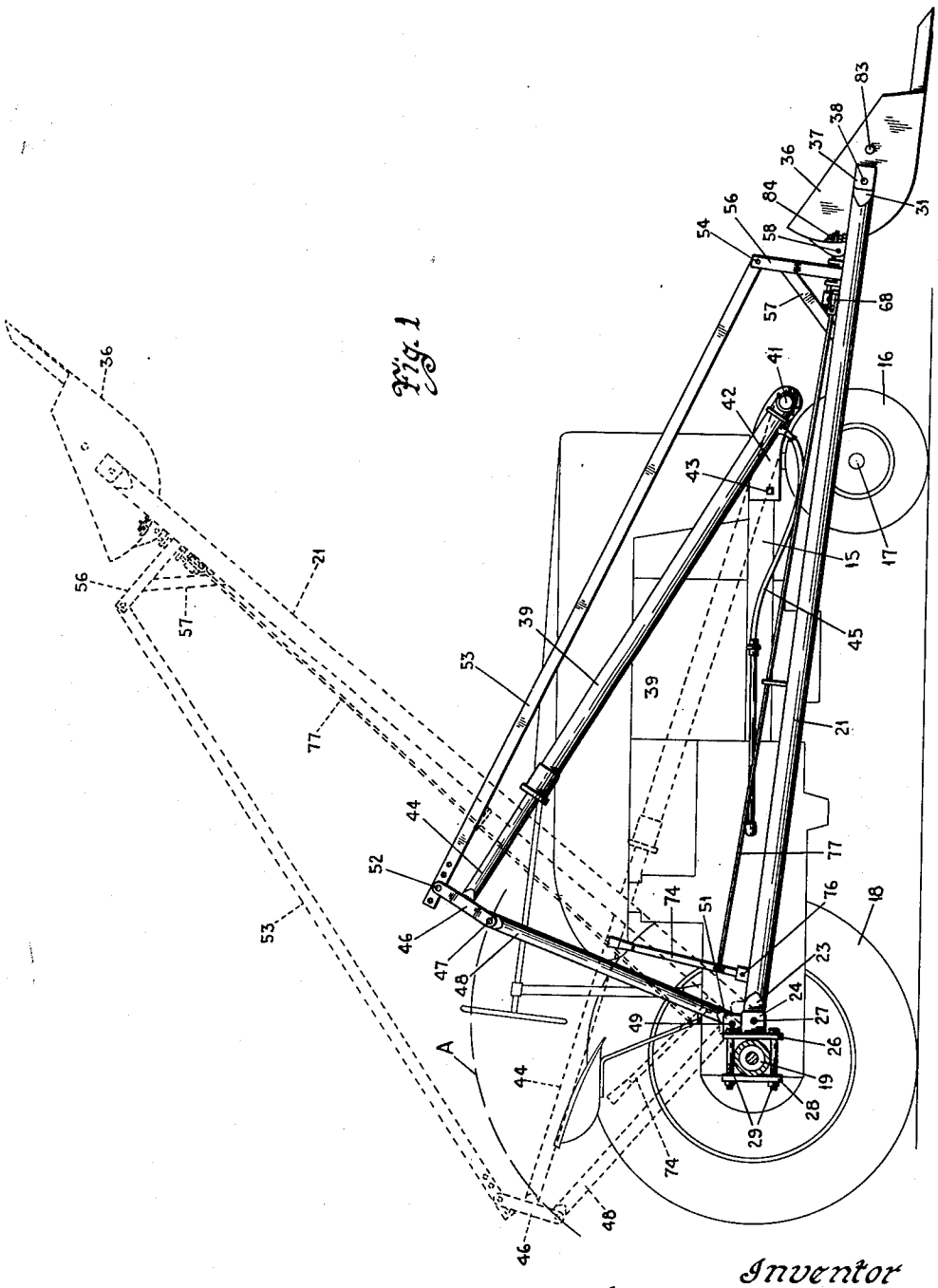


Fig. 1

Inventor
Gerald T. Baker
By Rudolph L. Lowell
Attorney

Jan. 22, 1952 G. T. BAKER 2,583,079

LOADING MACHINE

Filed Sept. 28, 1946 3 Sheets-Sheet 2

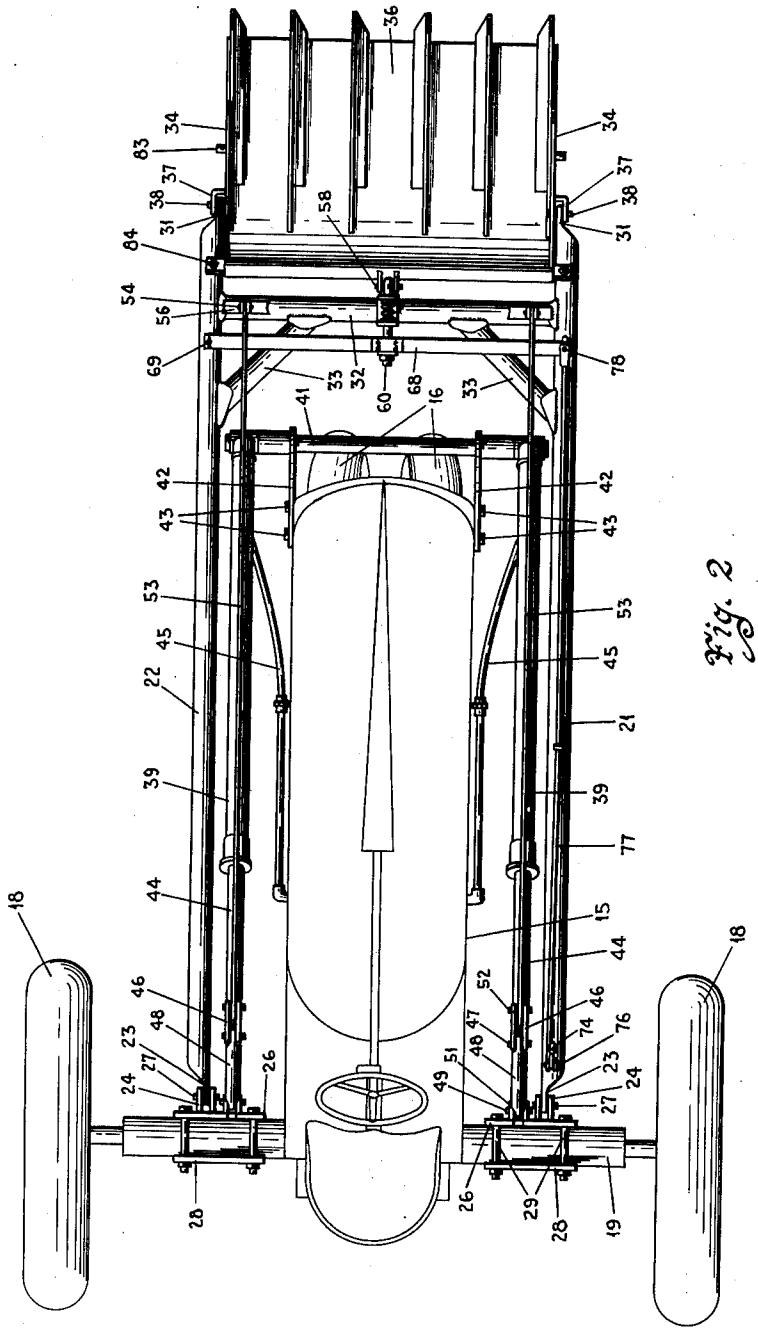


Fig. 2

Inventor
Gerald T. Baker
By Rudolph L. Lowell
Attorney

Jan. 22, 1952 G. T. BAKER 2,583,079

LOADING MACHINE

Filed Sept. 28, 1946 3 Sheets-Sheet 3

Fig. 3

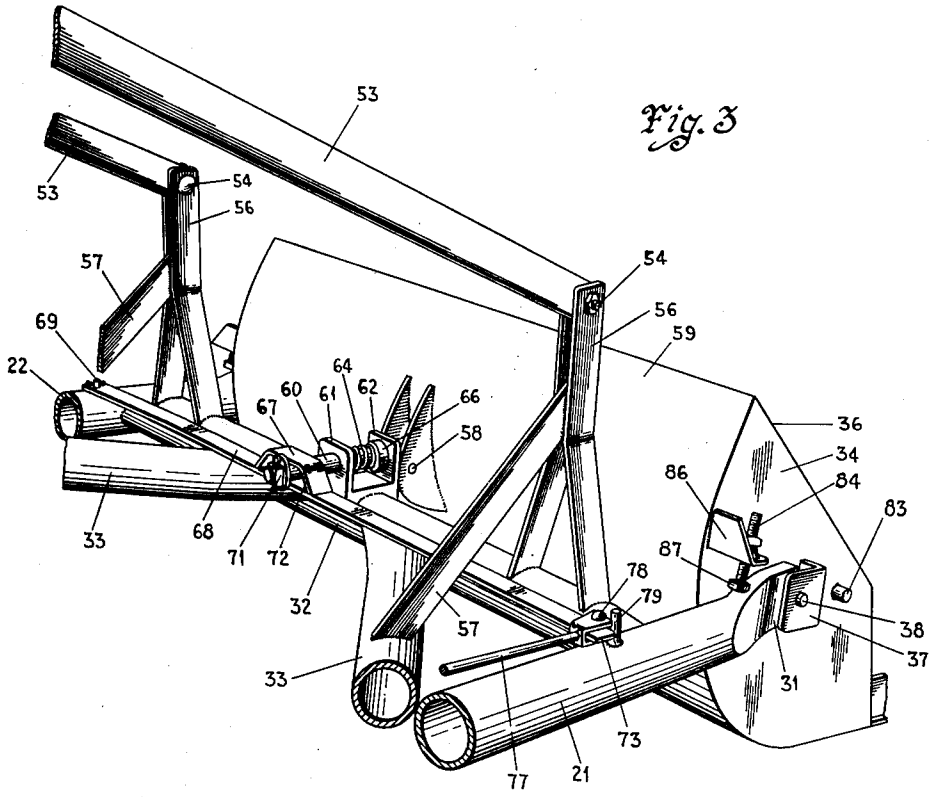
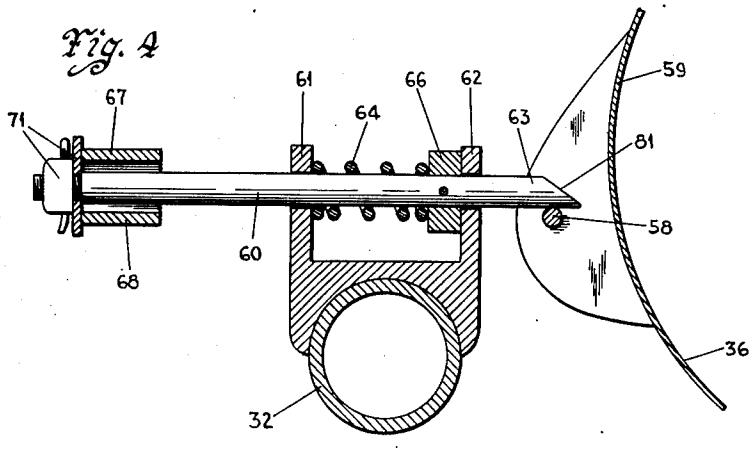


Fig. 4



INVENTOR.
Gerald T. Baker

BY Rudolph L. Lowell
Attorney

Patented Jan. 22, 1952

2,583,079

UNITED STATES PATENT OFFICE

2,583,079

LOADING MACHINE

Gerald T. Baker, Neligh, Nebr., assignor to Horn Manufacturing Company, Fort Dodge, Iowa, a corporation of Iowa

Application September 28, 1946, Serial No. 700,101

2 Claims. (Cl. 214—140)

1

This invention relates generally to loading machines and in particular to a loading attachment for a farm tractor adapted to handle hay, manure, dirt and like material.

An object of this invention is to provide an improved loading machine.

Another object of this invention is to provide a loading attachment for a tractor which is of a normal height substantially within the vertical confines of the tractor, light in weight and compact in design so that complete visibility to the tractor operator and normal ease of maneuverability of the tractor are retained during the operation of the attachment.

A further object of this invention is to provide a loading attachment for a tractor having a pair of pivoted lifting arms, in which hydraulic cylinders are connected with the lifting arms and with the tractor in a manner to apply a maximum lifting force on the arms, and to increase the rate of upward movement of the arms for a constant rate of movement of the cylinder pistons.

Yet another object of this invention is to provide a loading attachment for a tractor in which a pair of pivoted lifting arms are capable of upward pivotal movement to substantially upright positions by hydraulic cylinders.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawings in which:

Fig. 1 is a side elevational view of the loading attachment of this invention shown in assembly relation with a tractor, with parts broken away and in section to more clearly show such assembly;

Fig. 2 is a plan view of the loader attachment and tractor assembly shown in Fig. 1;

Fig. 3 is an enlarged detail fragmentary perspective view of the latching mechanism for the attachment load carrying scoop; and

Fig. 4 is an enlarged detail longitudinal sectional view of the latching mechanism.

With reference to the drawings, the loader attachment of this invention is shown in Figs. 1 and 2 in assembly relation with a tractor including a frame 15, front dual wheels 16 supported on an axle 17 and rear traction wheels 18 carried on an axle 19.

The loading attachment of this invention (Figs. 1 and 2) includes a pair of pivoted lifting arms 21 and 22 arranged at opposite sides of the tractor. The lifting arms are of a pipe construction and formed with flat rear ends 23 receivable between spaced supports 24 projected forwardly from a front clamp plate 26 and pivoted on a pin 27 carried in the supports 24. The clamp plate 26 and a rear clamp plate 28 are clamped against opposite sides of the rear axle 19 by bolts 29.

2

The lifting arms 21 and 22 extend forwardly of the tractor and are connected together inwardly from their front ends 31 by a transverse pipe member 32, suitably braced with the arms by brace members 33. The front ends 31 are of a flat form adapted to be received between an adjacent side wall 34 of a scoop 36 and one of the legs 37 of L-shaped brackets projected laterally outwardly from the scoop walls 34. Pins 38 extended through the scoop side walls 34, the lifting arm front ends 31 and the bracket legs 37, pivotally support the scoop for pivotal movement between the lifting arms.

The lifting arms are raised and lowered by means including a pair of upwardly and rearwardly inclined hydraulic cylinders 39, pivotally mounted at their lower ends on a transverse shaft 41 carried ahead of the tractor on a pair of forwardly extended bracket supports 42 secured by bolts 43 to the tractor frame 15. As is clearly illustrated in Fig. 2, the shaft 41 extends between the lifting arms 21 and 22, and the cylinders 39 are connected through conduits 45 with a suitable oil pump unit (not shown) formed as part of the tractor for operating fluid pressure-operated tractor attachments and provided with valve means (not shown) for controlling the flow of fluid under pressure to the attachments.

Piston rods 44, for the cylinders 39, carry cross members 46 at their free ends, extended generally in an up and down direction (Figs. 1 and 2). The lower ends of the cross members 46 are pivotally connected through pins 47 with the upper ends of guide levers 48, while the lower ends of the guide levers are pivoted on pins 49 carried in supports 51 extended forwardly from the front clamp plates 26. The pivot supports 49 for the guide levers or members 48 are spaced above and inwardly of the lifting arm pivots 27 for a purpose which will appear later.

The upper ends of the cross arms 46 are pivoted at 52 to the rear ends of upwardly and rearwardly inclined lifting levers or rods 53, the lower or front ends of which levers are pivoted at 54 to the upper ends of a pair of upright members 56 carried at opposite ends of the transverse connecting member 32. Braces 57 are connected between the uprights 56 and the braces 33 for the transverse member 32. The lifting levers 53 and guide levers 48 are positioned in vertical planes common to the longitudinal axes of the cylinders 39 (Fig. 2).

On the application of a fluid pressure to the cylinders 39 the piston rods 44 are moved rearwardly whereby to apply a lifting force adjacent to the front ends of the lifting arms 21 and 22 through the lifting levers 53 and uprights 56, with the levers 48 acting to guide the pivotal movement of the cylinders 39 and to maintain

the cylinders 39 in positions extended longitudinally of the tractor.

When the lifting arms 21 and 22 are in their lowermost positions, illustrated in Fig. 1, the guide members 48 are inclined upwardly and forwardly at angles of substantially ninety degrees relative to the lifting levers 53. At these relative positions for the guide levers 48 and lifting levers 53, the cylinders 39 are substantially parallel to and below the lifting levers 53. This relative arrangement of the guide levers 48 and lifting levers 53 is maintained as the lifting arms are elevated and provides for an efficient lifting action on the lifting arms by the piston rods 44, by virtue of the fact that the upper ends of the guide levers 48 are movable in an arc indicated at A.

As previously mentioned, the pivots 49 for the guide levers 48 (Fig. 1) are spaced above the lifting arm pivots 27 so as to be located substantially in the plane of the top side of the rear tractor axle 19. The guide levers are thus freely movable to pivoted positions inclined upwardly and rearwardly from their pivots 49 and across the top of the rear axle, to provide for a maximum elevation of the lifting arms 21 and 22 to positions illustrated in dotted lines in Fig. 1, and approaching a vertical plane extended through their pivots 27. Although this maximum elevation of the lifting arms is not required in a usual operation of the loading machine for handling dirt and manure, it does provide a ready application of the attachment for loading and stacking hay and like material, as will be later explained.

On a release of the fluid pressure supplied to the hydraulic cylinders through the conduits 45, the lifting arms 21 and 22 are returned to their lowermost positions, shown in Fig. 1, by the action of gravity. It is to be understood, of course, that the arms are movable to any elevated position between their full line and dotted line positions illustrated in Fig. 1 and then held at such elevated position, by the actuation of the valve means for controlling the application of fluid under pressure to the cylinders 39.

The latching mechanism for the scoop 36 (Figs. 3 and 4) includes a catch pin 58 carried between a pair of transversely spaced supports projected rearwardly from the scoop back wall 59. A longitudinally extended latch pin 60 is loosely extended through the legs 61 and 62 of a U-shaped bracket carried centrally of the transverse connecting member 32 and on the top side of the member 32. The front end 63 of the latch pin 60 is yieldably moved and held in an engaging position with the catch pin 58 by a coil spring 64 mounted about the latch pin between the U-shaped bracket legs 61 and 62 and arranged in compression between the rear leg 61 and a stop collar 66 mounted on the latch pin and engageable with the front leg 62 to limit the forwardly moved position of the latch pin.

The rear end of the latch pin is extended through an upright loop member 67 carried on a transverse pivoted lever arm 68 arranged rearwardly of the transverse connecting member 32 and having one end pivoted at 69 to the top side of the lifting arm 22. A nut and washer assembly 71 at the rear end of the latch pin 60, is engageable with the rear edge 72 of the loop 67 to provide for a rearward longitudinal movement of the latch pin 60, when the free end 73 of the pivoted lever 68 is moved rearwardly or to the left, as viewed in Fig. 3. This rearward movement of the lever 68 takes place against the action of the spring 64.

A rearward movement of the lever 68 is accomplished manually by the provision of an upright pivoted release lever 74 (Fig. 1) pivoted at 76 on the top and adjacent to the rear end of the lifting arm 21. A rod 77, extended longitudinally of the lifting arm 21, is pivoted at its rear end to the release lever 74, while its forward end is pivoted at 78 to the free end 73 of the transverse lever 68.

Thus on a rearward or counter-clockwise movement of the release lever 74, as viewed in Fig. 1, the transverse lever 68 is moved rearwardly or to the left, as viewed in Fig. 3, against the action of the spring 64, with this movement moving the latch pin 60 longitudinally rearwardly and out of an engaging position with the catch pin 58, whereby the scoop 36 is released for dumping. When the lever 74 is released, the latch pin 60 is returned to its engaging position with the catch 58, and the lever 68 is returned to its position illustrated in Fig. 3 against the stop member 79 by the spring 64.

It is contemplated that the scoop 36 be pivotally supported on the pivots 38, such that when a load is dumped therefrom, the rear end of the scoop 36 will be sufficiently heavier than its forward end to accomplish a return of the scoop to its loading position by the action of gravity. As the scoop 36 is pivotally moved in a counter-clockwise direction, as viewed in Figs. 3 and 4, to its load carrying position, the catch pin 58 engages the upwardly and rearwardly inclined or tapered surface 81 formed at the front end 63 of the latch pin 60. As a result of this engagement the latch pin 60 is moved rearwardly by the downward pivotal movement of the pin 58 until the pin 58 is at a position below the lower edge of the latch pin 60. The latch pin 60 is then moved forwardly by the spring 64 to engage the top side of the catch pin 58 whereby to hold the scoop 36 in a load carrying position.

The dump position of the scoop 36 is limited by a pair of oppositely arranged stops 83 extended laterally outwardly from the scoop's side walls 34 at positions located forwardly of the scoop pivots 38, when the scoop 36 is in a load-carrying position (Figs. 1 and 3). On a release of the scoop 36, and the resultant pivotal movement of the scoop 36 in a clockwise direction, as viewed in Fig. 3, the stops 83 are moved into engagement with the under sides of the front ends 31 of the lifting arms 21 and 22.

The angle of the scoop 36, relative to the ground surface, is adjustable for bucking purposes by the provision of adjustable screws 84 threadably supported in brackets 86 extended laterally outwardly from the scoop's side walls 34 at positions spaced rearwardly and above the scoop pivots 38, when the scoop is in a load carrying position. The lower ends 87 of the adjustable screws 84 are engageable with the top sides of the lifting arm front ends 31.

Having described a preferred embodiment of my invention, I claim:

1. In combination in a loader attachment for a tractor having a transversely extending rear axle housing, a rigid lifting frame comprising a pair of rigid longitudinally extending lifting arms pivotally attached at their rear ends to the tractor axle housing, a transverse structural member rigidly attached to and extending between the forward portions of said lifting arms, a pair of upwardly and rearwardly extending hy-

draulic cylinder and piston assemblies, each positioned at one side of the tractor inwardly of said lifting arms, the lower forward ends of said hydraulic assemblies being pivotally attached to the forward end of the tractor, a pair of upwardly and rearwardly extending lifting rods each disposed respectively in a common longitudinally extending vertical plane with one of said hydraulic assemblies, the lower forward ends of said lifting rods being pivotally attached to said transverse structural member, the upper rear ends of said lifting rods being pivotally attached adjacent the upper rear ends respectively of said hydraulic assemblies, a pair of rigid guide members, each connected at one end to the upper rear end of one of said hydraulic assemblies and at the other end to the tractor rear axle housing above and inwardly of the points of pivotal attachment of said lifting arms, each of said guide members lying in the common vertical plane of the associated hydraulic assembly and lifting rod, a load carrying unit pivotally mounted at the forward end of said lifting frame, a spring loaded latch slidably secured to said transverse structural member and releasably engaging said load carrying unit, and means for moving said latch out of engagement with said load carrying unit.

2. In combination in a loader attachment for a tractor having a transversely extending rear axle housing, a rigid lifting frame comprising a pair of longitudinally extending lifting arms pivotally attached at their rear ends to the tractor axle housing, a transverse structural member rigidly attached to and extending between the forward portions of said lifting arms, a pair of upwardly and rearwardly extending hydraulic

cylinder and piston assemblies, each positioned at one side of the tractor inwardly of said lifting arms, the lower forward ends of said hydraulic assemblies being pivotally attached adjacent the forward end of the tractor, a pair of upwardly and rearwardly extending lifting members each disposed respectively in a common longitudinally extending vertical plane with one of said hydraulic assemblies, the lower forward ends of said lifting members being pivotally attached to said transverse structural member, the upper rear ends of said lifting members being pivotally attached adjacent the upper rear ends respectively of said hydraulic assemblies, and guide members pivotally interconnecting each of said hydraulic assemblies and the tractor axle housing at points lying above the points of pivotal attachment of said lifting arms, each of said guide members lying in the common vertical plane of the associated hydraulic assembly and lifting member.

GERALD T. BAKER.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,268,689	Andrus	Jan. 6, 1942
2,304,672	Bell	Dec. 8, 1942
2,391,857	Arps et al.	Jan. 1, 1946
2,403 808	Laughead	July 9, 1946
2,404,619	Coats	July 23, 1946
2,404,820	Wuertz et al.	July 30, 1946
2,495,143	Simmonds	Jan. 17, 1950