

April 28, 1936.

C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets—Sheet 1

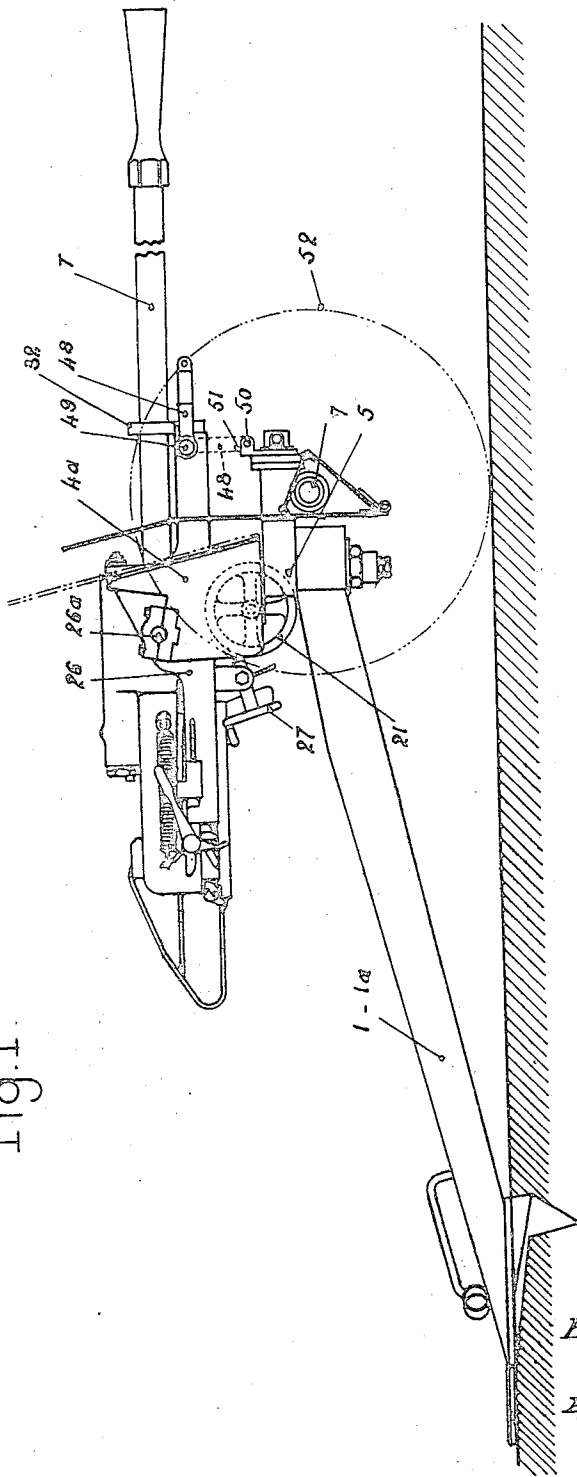


Fig. 1

Inventors
Charles Sutter
Eugene Albert Dugied
By *McKinson & Macpherson*
Attorneys

April 28, 1936.

C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets-Sheet 2

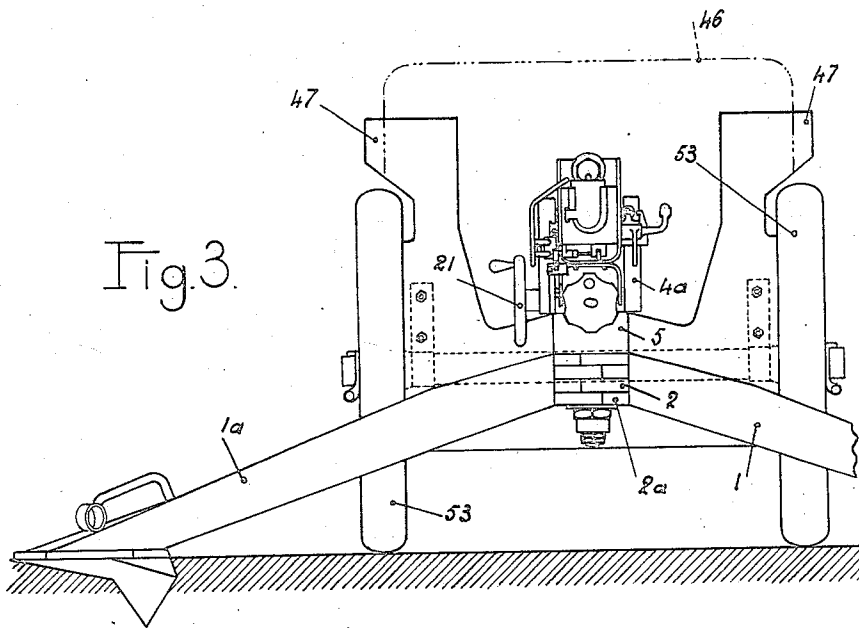


Fig. 3.

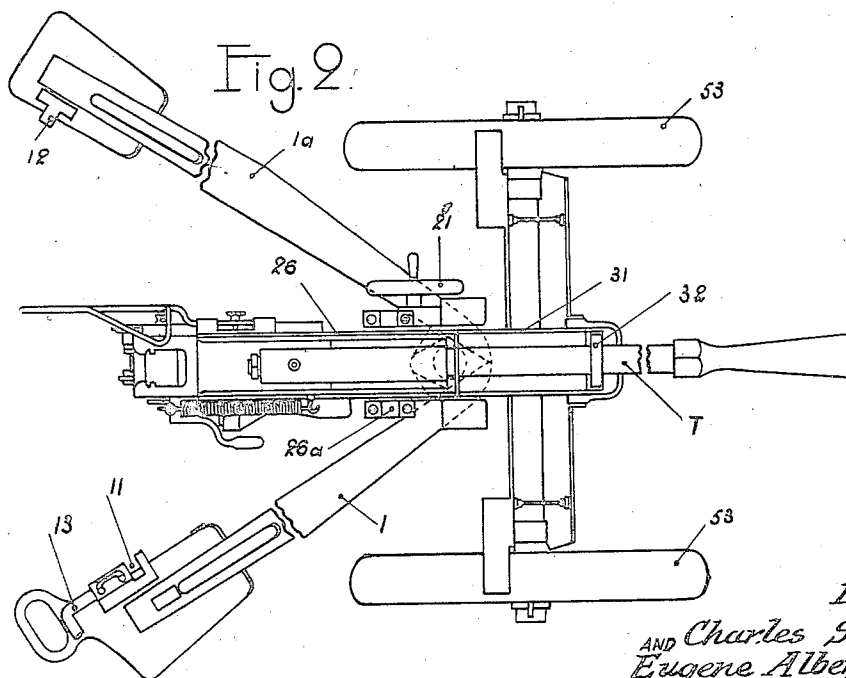


Fig. 2.

Inventor
AND Charles Sutter
Eugene Albert Dugied

By Wilkinson & Mawhinney
Attorneys

April 28, 1936.

C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets-Sheet 3

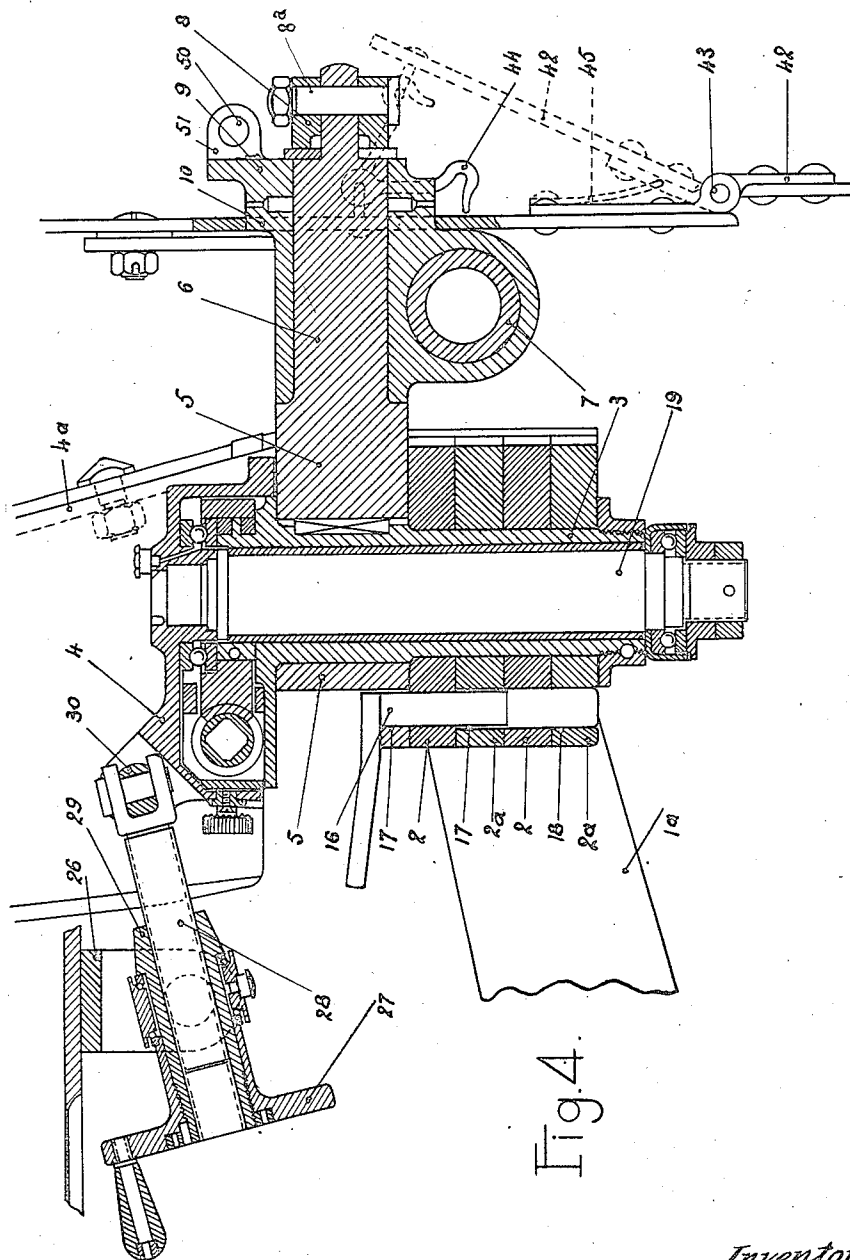


Fig. 4

Inventors
AND Charles Sutter
Eugene Albert Dugied

By Wilkinson & Mackinnon
Attorneys

April 28, 1936.

C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets-Sheet 4

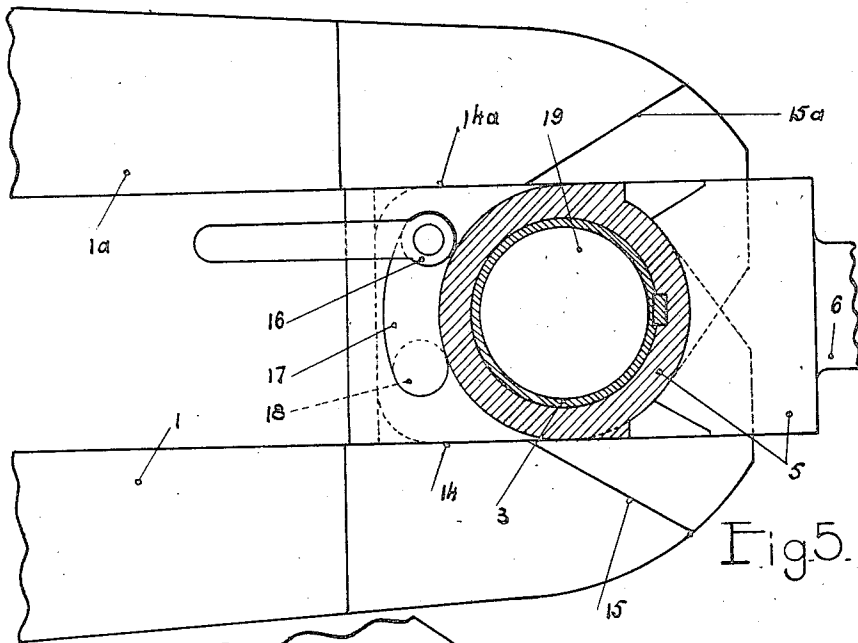


Fig. 5.

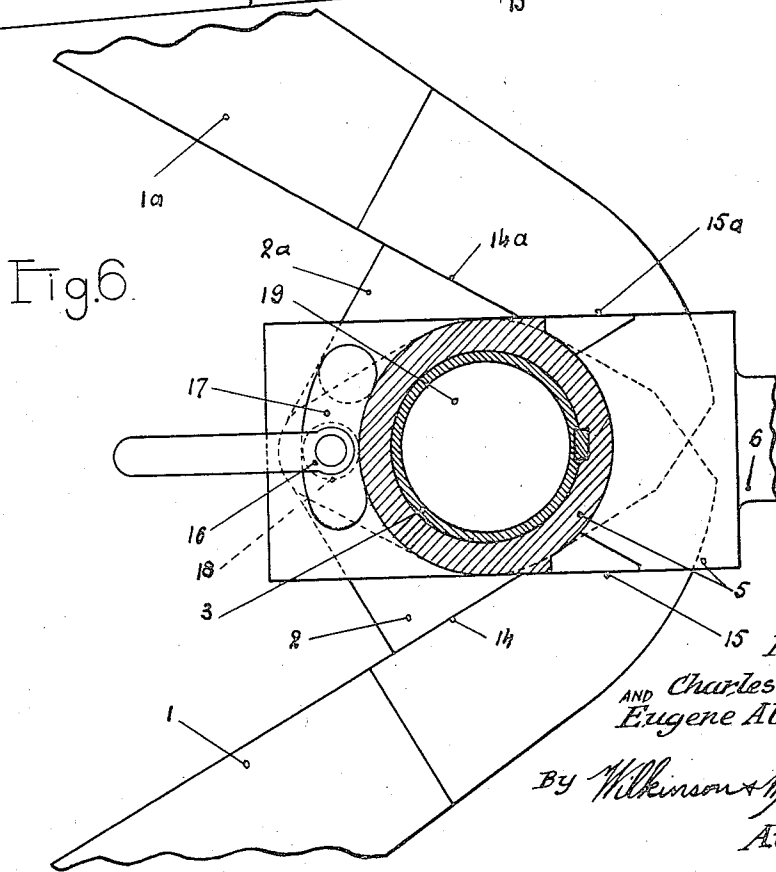


Fig. 6.

Inventors
AND Charles Sutter
Eugene Albert Dugies

By Wilkinson & Washburney
Attorneys

April 28, 1936.

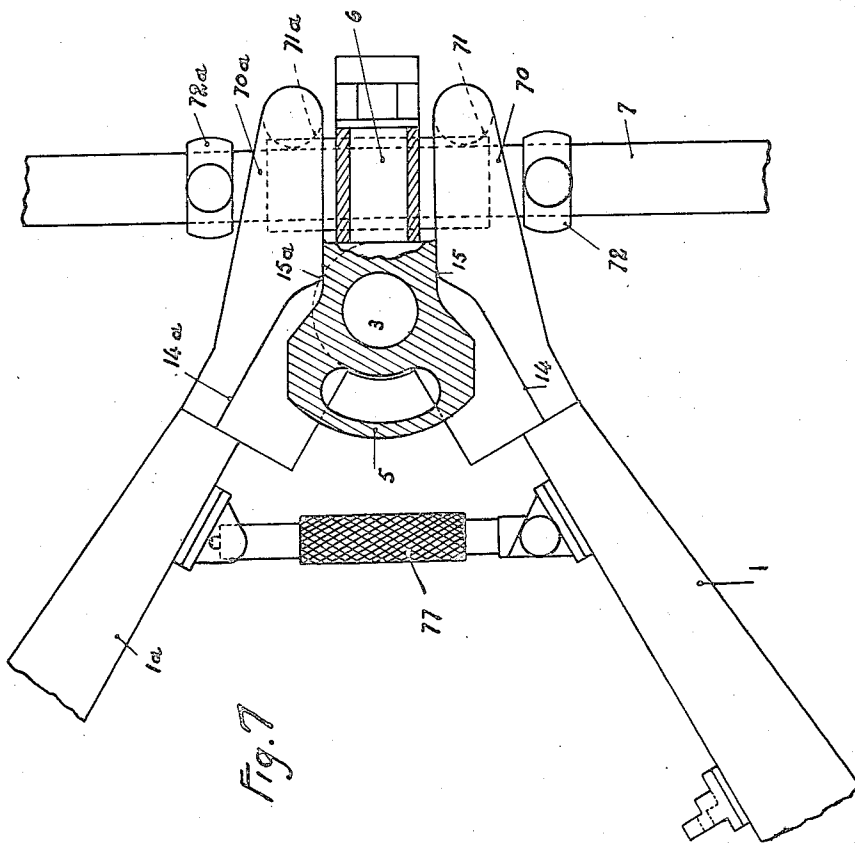
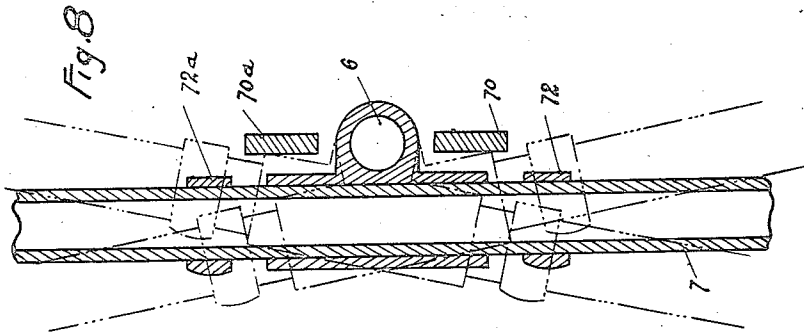
C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets-Sheet 5



Inventors
Charles Sutter
Eugene Albert Dugied
By *Wilkinson & Washburne*
Attorneys

April 28, 1936.

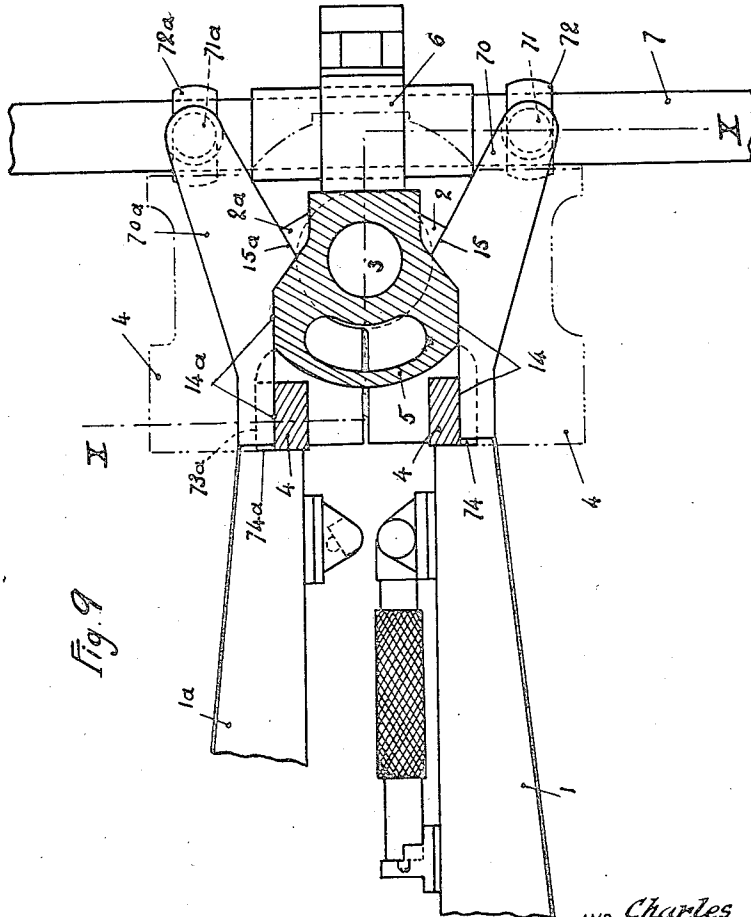
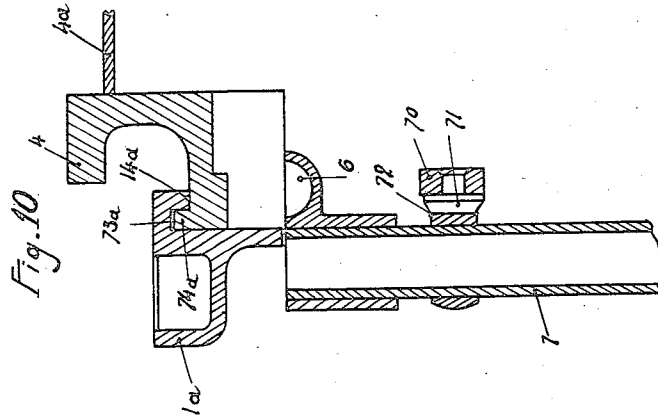
C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets-Sheet 6



Inventors
AND Charles Sutter
Eugene Albert Dugied
By Wilkinson & MaWhinney
Attorneys

April 28, 1936.

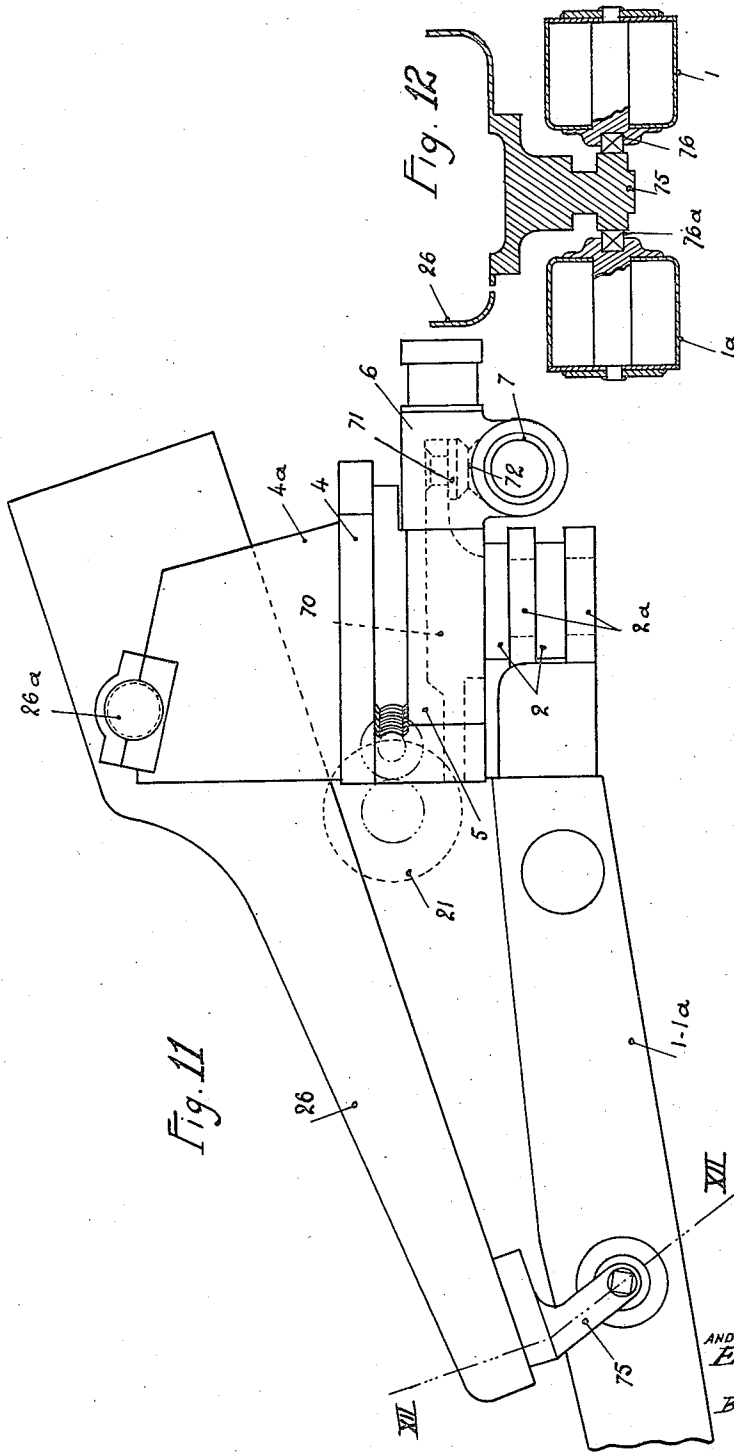
C. SUTTER ET AL

2,039,198

GUN CARRIAGE

Filed Aug. 8, 1934

7 Sheets—Sheet 7



Inventors
AND Charles Sutter
Eugene Albert Dugied
By Wilkinson Mashinney
Attorneys

UNITED STATES PATENT OFFICE

2,039,198

GUN CARRIAGE

Charles Sutter, Suresnes, and Eugène Albert Dugied, Courbevoie, France, assignors to Société Anonyme Des Anciens Etablissements Hotchkiss & Cie., Levallois-Perret, Seine, France

Application August 8, 1934, Serial No. 739,050
In France December 18, 1933

5 Claims. (Cl. 89—40)

The present invention has reference to a gun-carriage mounted on wheels for a gun or a machine gun, which is readily transportable, very steady in the firing position, and which is readily brought from transport to firing position and conversely.

Said gun-carriage comprises a carriage-support carried by a two-wheel axle and the two rear trails, and in order to permit aiming in direction, a pivoting support with respect to said carriage support and on which the fire-arm cradle may rock in order to permit of aiming for elevation.

The carriage according to the invention is characterized by a number of special arrangements which secure important advantages.

These arrangements and their advantages will become apparent from the ensuing description taken with reference to the accompanying drawings illustrating diagrammatically and merely by way of example an embodiment of the invention.

In these drawings, Figs. 1, 2 and 3 are respectively an elevation, a plan and an end view of the carriage and wheels according to the invention in the firing position.

Fig. 4 is a longitudinal section of the central portion of the carriage.

Figs. 5 and 6 illustrate diagrammatically through partial plan views the mounting of the rear trails on the center pivot, in closed and open positions respectively.

Fig. 7 is a sectional plan view of a modified form of gun-carriage in the firing position, illustrating the mounting of the trails and carriage-body unit on the wheel axle.

Fig. 8 is a sectional elevation along the axis of the axles, showing in chain-dotted lines the possible inclination the axle may assume with respect to the carriage body.

Fig. 9 is a sectional plan view of the carriage in position for transport, showing in chain-dotted lines the pivoting cradle support.

Fig. 10 is a cross-section on X—X, Fig. 9.

Fig. 11 is a longitudinal view of the carriage in the position for transport, with the right trail removed.

Fig. 12 is a cross-section on XII—XII, Fig. 11.

The carriage according to the invention has two rear trails 1 and 1a pivotally mounted through the medium of their cheeks 2 and 2a (Fig. 4) engaging in alternating relation on a tubular axle pivot 3, on which is likewise mounted a pivoting cradle support 4. On said pivot 3 is rigidly fixed the main body 5 of the carriage which carries in front a shaft 6 about which can rock a wheel-carrying axle 7. Said axle can,

however, be connected to the main body of the carriage by means of a double eccentric or cam 8 which, by rotating about a pin 8a, in the outer end of the shaft 6, causes the toothing of a clutch member 9 adapted to slide without rotation on the shaft 6, to engage the toothing of a second clutch member 10 connected to the axle 7.

The trails may take up two positions: the closed position (Fig. 5) for transport, and the open position (Fig. 6) for firing. In the closed position, the rear ends are connected together by a hooking device comprising (Fig. 2) a strap 11 mounted on the trail 1 and within which may engage a bolt 12 carried by the trail 1a. These two members are locked by a latch 13. In the closed position the carriage body 5 is prevented from moving sideways, due to the fact that the faces 14 and 14a of the trails 1 and 1a abut against corresponding faces of the carriage body 5 (Fig. 5). In the open position (Fig. 6), the carriage body is likewise prevented from moving, due to the fact that the faces 15 and 15a of the trails bear against the faces of the carriage body. Said trails are locked in their open position by a peg 16 which passes through two cylindrical holes made in the cheeks 2—2 of the trail 1 (Fig. 4) and two arcuate slots 17 (Figs. 4 to 6) made respectively in the carriage body 5 and in the upper cheek 2a of the trail 1a, said peg dropping, when the trails attain the open position, into a cylindrical hole 18 of the other cheek 2a, whereby the two trails are locked.

The pivoting support 4 may swivel on the central pivot 19 engaged in the tubular pivot 3. This movement permits aiming in direction.

On the pivoting support 4, which is provided for this purpose with cheeks 4a, there may rock about trunnions 26a (Fig. 1) the cradle 26 of the fire-arm, which may be aimed for elevation.

During transport, the cradle 26 carrying the fire-arm is rigidly connected to the axle 7 by a stirrup 48 hinged to the cradle at 49 (Fig. 1) and which may be fixed by the peg 50 in a strap 51 carried by the axle. This arrangement eliminates during transport any risk of damage to the mechanisms for aiming for direction and elevation which might be caused by the vibrations due to jolts.

Conditions of use

(a) *Transport.*—For transport, the trails 1 and 1a are connected at their rear ends by the locking device 11, 12, 13; the carriage body 5 is then fastened by the abutment faces 14 and

14a of the trails (position shown in Fig. 5). The axle 7 is rigidly secured to the carriage body 5 through the instrumentality of the cam 8 which holds the clutch members 9 and 10 illustrated in Fig. 4 in mesh; said cam may be held in its locking position by any appropriate means, for example by a strap. The cradle 26 of the fire-arm and pivoting support 4 is prevented from moving sideways and vertically by the stirrup 48 engaged in the strap 51 and retained by the peg 50 (position shown in dotted lines in Fig. 1).

(b) *Firing*.—For firing, the stirrup 50 is brought into its raised position in which it is retained by a spring-pressed stud (in full lines in Fig. 1). The cradle 26 and the pivoting support 4 are thus released, thereby permitting of aiming in direction and for elevation.

The rear ends of the trails 1 and 1a are unlocked and then moved apart until their abutment faces 15 and 15a bear against the corresponding faces of the carriage-body 5 (Fig. 6); at this instant, the peg 16 comes into register with the hole 18 of the lower cheek 2a of the trail 1a and may be engaged therein, thus locking the four cheeks 2—2a and the carriage-body 5 which is maintained between the abutment faces 15 and 15a.

The cam 8 (Fig. 4) is brought into unlocking position, which enables the two clutch members 9 and 10 to be released. The carriage-body 5 can thus rock freely about the axis of the spindle 6. With this arrangement, the rear ends of the trails 1 and 1a will always rest on the ground, whatever differences of level there may be, and irrespective of the inclination assumed by the axle 7. Furthermore the spades will always act as a support, however far they may have sunk into the ground.

It will be observed that certain of the improvements which have just been described as applied to the carriage on wheels according to the invention, might be applied in the same conditions and securing the same advantages to carriages other than carriages on wheels.

The component parts of the gun-carriage which has just been described have great freedom of movement for firing, but for transport, where such freedom of movement would be harmful, it is necessary to eliminate same by making connections which entail additional operations in order to pass from the firing to the transport position or vice versa.

A modified construction will now be described which by the simple operation of bringing the rear trails together, enables the gun-carriage to be converted into an integral unit adapted to negotiate any kind of ground.

To this end, the heads of the rear trails are each extended forwardly by an arm having a boss at its end. When the two trails are brought together, both bosses are brought into contact with corresponding bosses carried by the axle. The unit formed by the trails and the carriage body which, in the first form of the device, could, when in the firing position swivel freely about an axis substantially perpendicular to the axis of the axle, and substantially horizontal, is now locked on the axle in one position only. In this manner the first additional connection is secured.

The two other additional connections: the connection of the pivoting support on the one hand and the cradle, on the other hand, with the trails, carriage-body and axle block are obtained by encasement of the pivoting support and the

cradle between the trails which have been brought together.

The three connections have thus been made simultaneously.

The gun-carriage (Fig. 7) includes as previously two rear trails 1 and 1a pivotally mounted through the medium of their cheeks 2—2a on a vertical pivot 3 rigidly secured to a carriage body 5 carrying at the front end a shaft 6, about which the axle 7 may swivel.

In the open position of the trails for firing, movement of the carriage body is prevented, due to the fact that it is retained between the two faces 15 and 15a of the trails.

The heads of the trails are extended forwardly by arms 70, 70a respectively, on the ends of which bosses 71 and 71a are provided respectively. In the firing position (Figs. 7 and 8), said bosses do not lie above the axle 7. In the position for transport on the contrary (Figs. 9 and 10), the bosses are in contact with corresponding bosses 72—72a carried by the axle 7.

The axle which could rock about the axis of the shaft 6, in the firing position (Figs. 7 and 8), is thus prevented from so doing in the closed position of the trails (Figs. 9 and 10).

The pivoting support 4 may swivel about the pivot 3. This movement which permits of aiming in direction, is controlled by any suitable mechanism, not illustrated, such as a worm and segmental worm wheel.

When it is desired to pass into the position of transport, the pivoting support 4 is first returned, by rotating the wheel 21 for aiming in direction, to the zero position, that is to say to such a position that its longitudinal axis lies in the bisector plane of the trails. When the trails are closed together (Figs. 9 and 10), their faces 14, 14a bear against the corresponding faces of the carriage body 5 and of the pivoting support 4 while projections 74, 74a of said support are engaged in recesses 73, 73a of the trails. Thus any rotational movement about the pivot 3 as well as any lifting movement of the pivoting support 4 are prevented.

The fire-arm cradle 26 may rock about the horizontal pin 26a of the pivoting support 4 (Fig. 11). This movement, which permits of aiming for elevation, is controlled by any suitable mechanism, not illustrated, such as a worm and worm wheel, similar for example to the one illustrated in Fig. 4. When it is desired to pass into the transport position, the fire-arm is first brought into its position of maximum elevation by operating the aiming hand-wheel. When the trails are closed together, a junction member 75 secured to the cradle (Figs. 11 and 12) is engaged in two housings 76—76a of the rear trails, thus preventing any rotational movement about the pin 26a.

The gun-carriage is brought into "in battery" position from the transport position in the following manner:

The rear ends of the trails 1—1a are unlatched and the trails are separated until their faces 15—15a abut against the carriage body 5. The trails are kept apart by any suitable device such as the stay 77 illustrated in Fig. 7. The carriage is then in firing position.

Conversely, in order to pass from the firing to the transport position, the aiming wheels are operated in order to bring the fire-arm into the plane bisecting the rear trails and into the position of maximum elevation; then the stay 77 which held the trails apart (Fig. 9) is swung down

sideways, the trails are closed together and their ends latched.

The gun-carriage is then in transport position. We claim:

- 5 1. A wheeled gun carriage comprising in combination, a trail body having a depending beam pivot, two trail beams both mounted on said pivot and adapted to assume a closed and a spread position, means for locking said beams in closed position, a cradle support mounted on said trail body for traversing rotation, abutment faces on said trail body and beams behind said beam pivot and engagement members on said rotatable cradle support and trail beams, said abutment faces and engagement members being adapted to respectively engage with one another when said beams are in closed position to directly fasten together said trail body, rotatable cradle support thereon and trail beams.
- 20 2. A wheeled gun carriage comprising in combination, a trail body having a depending beam pivot sleeve, two trail beams both mounted on said pivot sleeve and adapted to assume a closed and a spread position, means for locking said beams in closed position, a cradle support having a depending pivot engaged in said pivot sleeve and adapted to rotate on said trail body for traversing, abutment faces on said trail body and beams behind said pivot sleeve and engagement members on said rotatable cradle support and trail beams, said abutment faces and engagement members being adapted to respectively engage with one another when said beams are in closed position to directly fasten together said trail body, rotatable cradle support thereon and trail beams.
- 35 3. A wheeled gun carriage comprising in combination, a rigid trail body having a forwardly directed axle pivot and a depending beam pivot behind same, a two-wheel axle mounted on said axle pivot for transverse rocking on sloping ground, two trail beams both mounted on said beam pivot and adapted to assume a closed and a spread position, means for locking said beams in closed position, a cradle support mounted on said trail body and adapted to rotate thereon for traversing, means for fastening together said trail body and beams when the latter are in closed position, front members on said beams extending forwards of said beam pivot and crosswise of said axle and adapted to spread when said beams are closed, two spaced bosses on said axle and en-

gagement members on said rotatable cradle support and trail beams, said front members, bosses and engagement members being adapted to respectively engage with one another when said beams are in the closed position to directly fasten together said rocking wheel axle, rotatable cradle support on said trail body and trail beams.

4. A wheeled gun carriage comprising in combination, a rigid trail body having a forwardly directed axle pivot and a depending beam pivot behind same, a two-wheel axle mounted on said axle pivot for transverse rocking on sloping ground, two trail beams both mounted on said beam pivot and adapted to assume a closed and a spread position, means for locking said beams in closed position, a cradle support mounted on said trail body and adapted to rotate thereon for traversing, a cradle mounted on said cradle support for elevating rotation, means for fastening together said trail body and beams when the latter are in closed position, front members on said beams, extending forwards of said beam pivot and crosswise of said axle and adapted to spread when said beams are closed, two spaced bosses on said axle, a rigid connection member on said cradle and recesses in said beams, said front members, bosses, connection member and recesses being adapted to respectively engage with one another when said beams are in closed position to directly fasten together said wheel axle, cradle and trail beams.

5. A wheeled gun carriage comprising in combination, a trail body having a depending beam pivot, two trail beams both mounted on said pivot and adapted to assume a closed and a spread position, means for locking said beams in closed position, a cradle support mounted on said trail body for traversing rotation, a cradle mounted on said cradle support for elevating rotation, means for fastening together said trail body and beams when the latter are in closed position, engagement members on said rotatable cradle support and trail beams, a rigid connection member on said cradle and recesses in said beams, said engagement members, connection member and recesses being adapted to respectively engage with one another when said beams are in closed position to directly fasten together said cradle, cradle support on said trail body and trail beams.

CHARLES SUTTER.

EUGÈNE ALBERT DUGIED.