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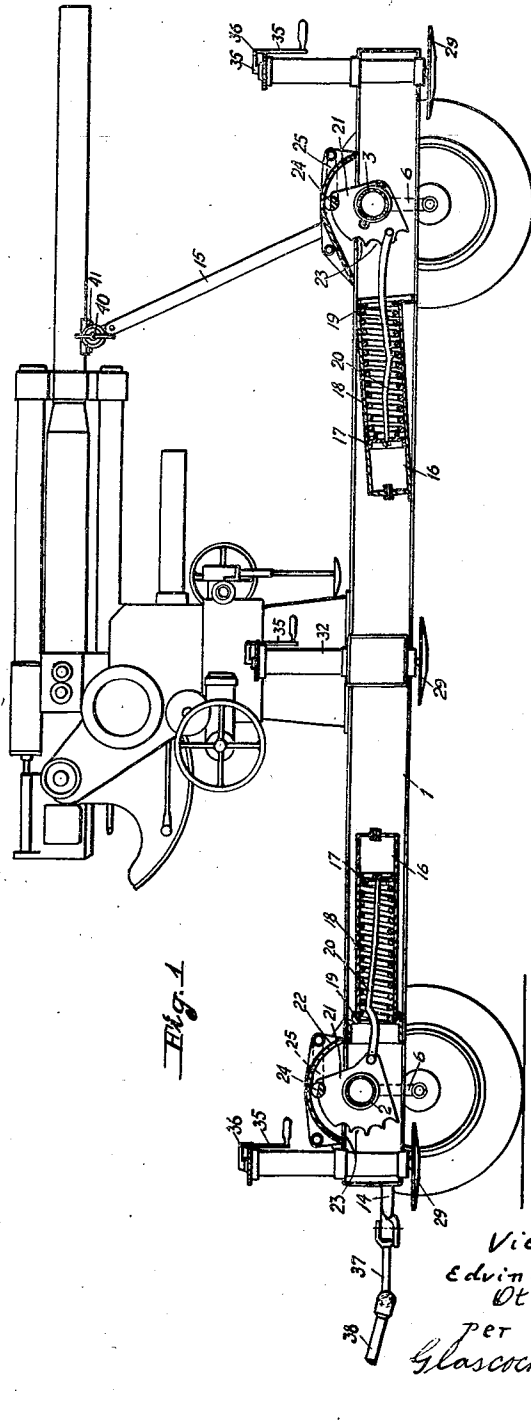
V. HAMMAR ET AL

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WHEELED FIREARM

Filed Nov. 23, 1935

4 Sheets-Sheet 1



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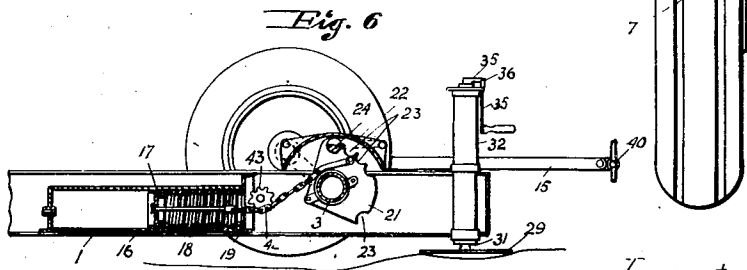
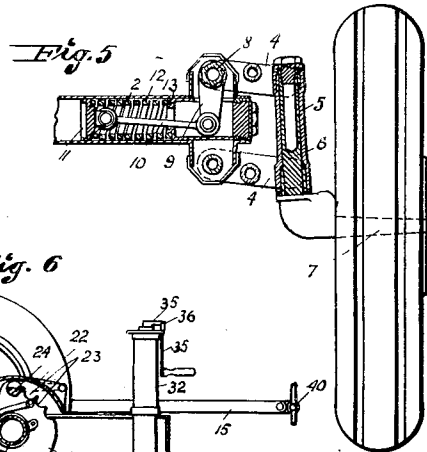
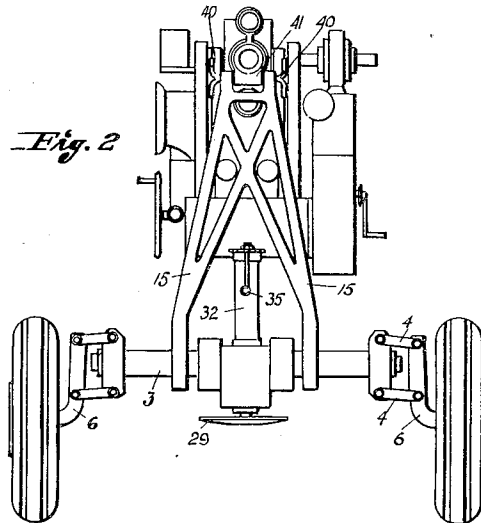
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WHEELED FIREARM

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4 Sheets-Sheet 2



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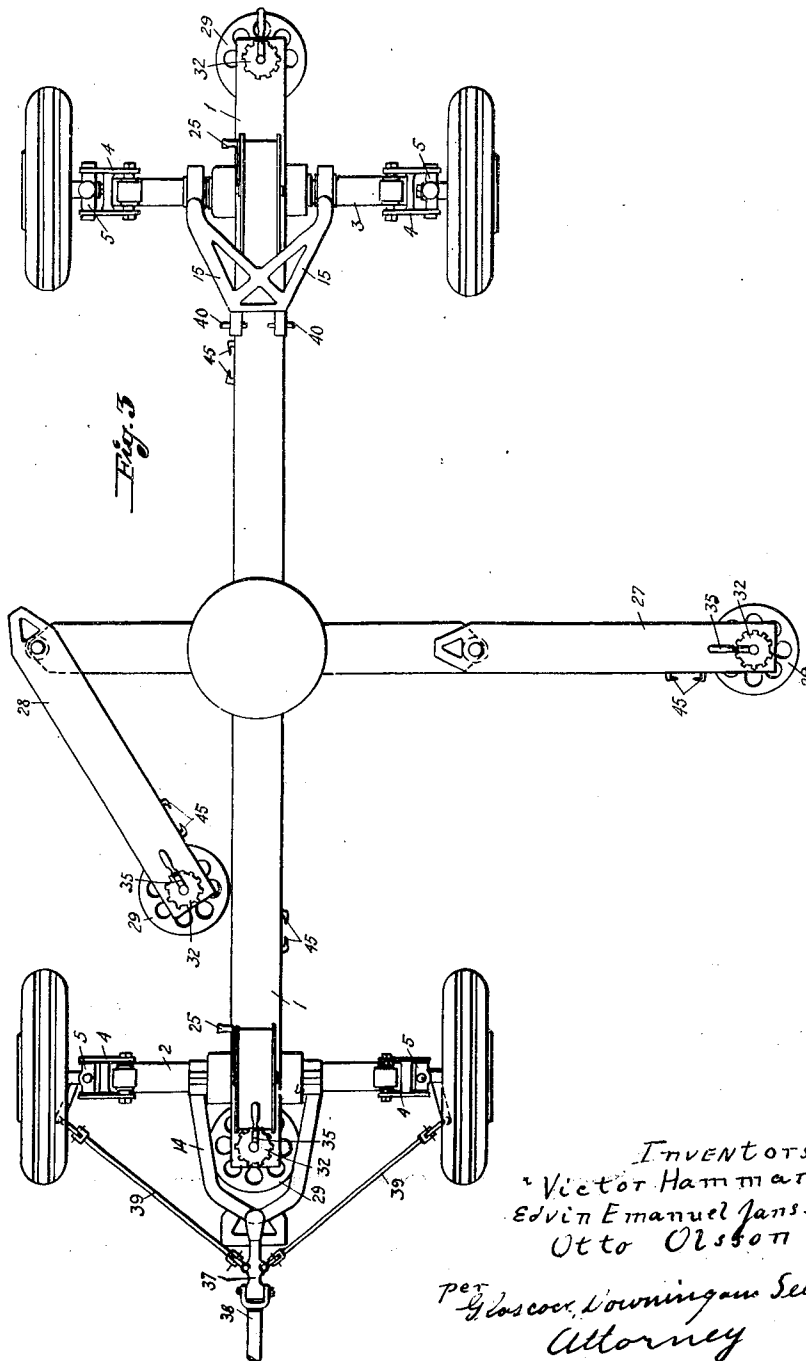
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WHEELED FIREARM

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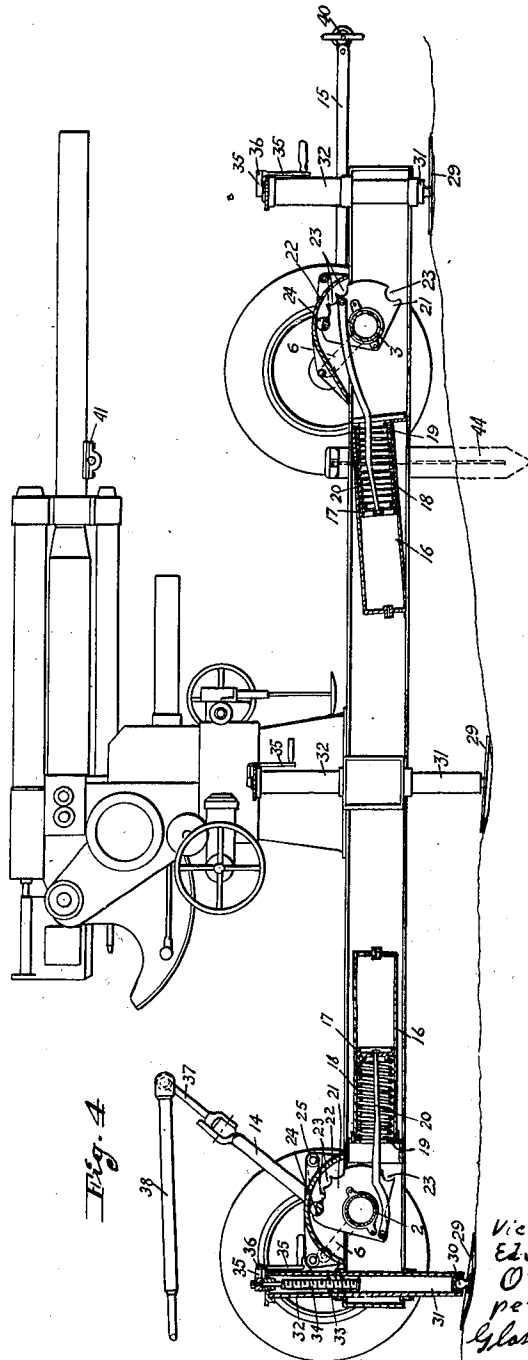
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WHEELED FIREARM

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,103,670

WHEELED FIREARM

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Application November 23, 1935, Serial No. 51,316
In Sweden November 23, 1934

6 Claims. (Cl. 89—40)

The present invention relates to wheeled fire-
arms such as guns, machine-guns or the like, in
which the wheels are mounted by means of
cranks or angle arms on axles turnably mounted
in the carriage framing, so that by turning said
axles the carriage can be brought from the travel-
ing position to rest, in the firing position, on the
ground with the wheels in an unloaded state and
vice versa.

The invention has for its object to bring about
a simple and quick manoeuvring at the said
changing-over operations and consists substan-
tially in this that in order to bring about a turn-
ing of the said carriage axles there are arranged
levers or arms rigidly connected to said axles and
swingable up and down by hand and that there is
provided a balancing device between the respec-
tive axle and the carriage framing for facilitat-
ing the lowering and raising of the piece.

In the annexed drawings one form of embod-
iment of an arrangement according to the inven-
tion is shown as applied to a field-piece having
four wheels.

Fig. 1 shows the carriage and the appertaining
gun viewed from the side, and

Fig. 2 is a rear-view thereof, the carriage
being in the travelling position.

Fig. 3 is a top view of the carriage with the
appertaining wheels.

Fig. 4 is a side view of the gun with the car-
riage in a lowered position (the firing position).

Fig. 5 is a front view of one of the wheels and
part of the corresponding carriage axle with an
associated spring suspension device partly in
section.

Fig. 6 is a side view of part of the carriage
frame having a somewhat modified construction
of a balancing device for the piece.

The gun proper as well as the associated pivot-,
sighting- and recoil-means and the like may be
of any kind and will not be described, as they do
not belong to the present invention.

In the form of embodiment shown in Figs. 1
to 5, 1 designates the carriage framing, at the
fore and rear portion of which the carriage axles
2 and 3, respectively, are turnably mounted. The
said axles are tubular and hinged to their free
outer ends are link-systems 4, which are in turn
at their outer end joined to an intermediate
block 5, in which the normally substantially ver-
tical pivot 6 of a crank or angle arm is turnably
mounted. The horizontal arm 7 of the said crank
forms a journal for the associated wheel, as most
clearly visible from Fig. 5. From the same figure
there is also visible, as how the upper arms of the

link system 4 are connected by means of an axle 8
to an arm 9, which is joined to a pressure plate
11 by means of a rod 10, said pressure plate actu-
ating a compression spring 12 disposed within the
tubular axle 2 (and 3, respectively), which spring
with its outer end abuts against a collar 13 within
the axle. By such means the wheels will be
individually movable and spring suspended. As
will be more clearly described below, the wheels
are connected by pairs through link rods for
steering purposes.

Rigidly connected to the fore carriage axle 2
is a substantially V-shaped manoeuvring arm
14, by means of which the axle can be turned and
thus the wheels be swung up and down for bring-
ing the piece into firing position, Fig. 4, and
travelling position, Figs. 1-3, respectively. For
the same purpose a similar manoeuvring arm
15 is rigidly connected to the rear axle 3. In
order to facilitate the said movements a balancing
device is provided in the fore and rear portion, re-
spectively, of the carriage framing for each of the
pairs of wheels, said balancing device compris-
ing a cylinder 16 secured to the framing and
having a piston 17 movable therein, which is actu-
ated by a compression spring 18 in the cylinder,
said spring pressing with its one end against the
piston and with its other end against a flange 19
at the outer end of the cylinder. Jointed to the
piston is the one end of a tie rod 20, the outer end
of which is jointed to a locking disk 21 fixed to
the axles 2 and 3, respectively. The said disk
which is covered by a casing 22 secured to the
upper side of the carriage framing, is provided
at its circumference with a number of notches 23
forming seats for a locking stud 24 having a semi-
circular cross-section and which may be turned
by means of a crank 25 located outside the casing
22. The two outermost notches 23 correspond to
the fully lowered and fully raised position, respec-
tively, of the wheels, while the remaining notches
have for their object to facilitate a locking of
the wheels in intermediate positions for the pur-
pose described below.

In order to support the carriage with the gun
on the ground in the firing position, when the
carriage has been lowered (the wheels raised)
there are provided four mutually similar, inde-
pendent supporting devices, i. e. one at each end
of the carriage frame and one at the outer end
of each of two outriggers 27 and 28, respectively,
swingably connected to the sides of the framing
and capable of being locked thereto.

Each of the said supporting devices comprises
a foot plate 29, which is connected by means of a

ball and socket joint 30 to the lower end of a tubular piston 31 movable in a cylinder 32 secured to the carriage frame and to the outriggers, respectively. The adjustment of the piston 31 and the foot plate 29 takes place by means of a screw 34 screwed into a bushing 33 secured to the piston, said screw being journalled at the upper end of the cylinder and being turned by a crank arm 35 secured to the upper end of the screw spindle. The said arm has a joint at 36, so as to be capable, when not in use, of being turned downwardly along the cylinder wall and brought into engagement with teeth disposed at the upper end of the cylinder for locking purpose.

Joined to the fore manoeuvring arm 14 is by means of a link 37 a rod 38 serving as a pull rod at the travelling and also two link rods 39 connected to the wheels for the steering thereof.

The rear manoeuvring arm 15 is adapted, when in its swung up position (the travelling position) to form a support for the elevating system and for this purpose it is provided at its outer end with two locking members forming screw bolts 40, which may engage a locking block 41 secured to the elevating system. For the securing of the arm 15 to the elevating system obviously also other members may be used, such as for instance a bandage or the like applicable around the gun.

The form of embodiment shown in Fig. 6 differs from that one according to Figs. 1 to 5 substantially in this respect only that here a chain linkage 42 is included in the connection between the locking disk 21 and the balancing spring 18, said chain being guided by a sprocket wheel 43 rotatably mounted in the carriage frame.

The changing from travelling position, Figs. 1 to 3, to firing position, Fig. 4, takes place in the following manner.

The outriggers 27 and 28 are swung outwardly and locked. The locking studs 24 are disengaged from the locking disks 21 by means of the cranks 25, and then the fore manoeuvring arm 14 is swung upwardly and the rear manoeuvring arm 15 downwardly, so that the carriage 1 is lowered towards the ground and will be supported by the foot plates 29. The locking studs 24 are turned back into engagement with the locking disks 21, which will thus be locked with the wheels in a raised position. Then the foot plates are tightened by means of the associated set screws 34, so that all of the plates will bear against the ground and so that the piece will obtain the desired position.

If the ground be uneven, so that the plates 29 will touch the ground before the locking disks 21 have been fully turned, it would be necessary to lift the wheels, which are heavy, since it will be necessary to overcome about half of the weight of the piece. In order to avoid this drawback the locking disks 21 are provided, as mentioned, with additional notches 23 for the locking stud 24, so that the disks and thus also the wheels can be locked also in intermediate positions.

In order to stable the piece in the firing position piles 44 applied to the carriage frame may be driven down into the ground. Guides 45 for such piles are shown in Fig. 3 at the carriage 1 and at the outriggers 27 and 28.

As to the form of embodiment shown it is to be noticed that, since the required spring force for the balancing varies in different positions, it may be suitable to arrange a plurality of springs within the balancing cylinders, which will be active at consecutive stretches.

What we claim as new and desire to secure by Letters Patent of the United States of America is:—

1. A four wheeled gun carriage comprising a framing, a front and rear axle turnably mounted in said framing, cranks in operative connection with each of said axles at the ends thereof and forming journals for the wheels, a link system between each of said cranks and the associated axle, a spring suspension device between each of the link systems and the axle, means for lowering said framing on to the ground and for raising it into the travelling position consisting of a hand operated lever firmly secured to each of said axles for turning the axles together with the associated cranks and wheels, and balancing means between said framing and each of said axles for facilitating the said lowering and raising of the firearm into firing position and the raising thereof into travelling position.

2. A four wheeled gun carriage comprising a framing, a front and rear tubular axle turnably mounted in said framing, cranks in operative connection with each of said tubular axles at the ends thereof, and forming journals for the wheels, a link system between each of said cranks and the associated axle, a spring suspension device within said tubular axle and in operative connection with said link system and said axle, means for lowering said framing on to the ground and for raising it into the travelling position consisting of a hand operated lever firmly secured to each of said axles for turning the axles together with the associated cranks and wheels, and balancing means between said framing and each of said axles for facilitating the said lowering and raising.

3. A four wheeled gun carriage comprising a framing, a front and rear axle turnably mounted in said framing, a link system joined to each end of each of said axles, a bearing block joined to the outer end of said link system, a crank having an upright pivot turnable in said bearing block, the horizontal arm of said crank forming a journal for the associated wheel, a spring suspension device between the said link system and the axle, means for lowering said framing on to the ground and for raising it into the travelling position consisting of a hand operated lever firmly secured to each of said axles for turning the axles together with the associated cranks and wheels, and balancing means between said framing and each of said axles for facilitating the said lowering and raising.

4. A four wheeled gun carriage comprising a framing, a front and rear axle turnably mounted in said framing, a link system joined to each end of each of said axles, a bearing block joined to the outer end of said link system, a crank having an upright pivot turnable in said bearing block, the horizontal arm of said crank forming a journal for the associated wheel, a spring suspension device between the said link system and the axle, means for lowering said framing on to the ground and for raising it into the travelling position consisting of a hand operated lever firmly secured to each of said axles for turning the axles together with the associated link systems, cranks and wheels, a locking disk firmly secured to each of said axles, a spring balancing means connected to said carriage framing and in operative connection with said disk, and an adjustable locking member on said framing co-operating with said locking disk.

5. A four wheeled gun carriage comprising a

framing, a front and rear tubular axle turnably mounted in said framing, a link system joined to each end of each of said axles, a bearing block joined to the outer end of said link system, a crank
5 having an upright pivot turnable in said bearing block, the horizontal arm of said crank forming a journal for the associated wheel, a spring suspension device within said tubular axle and in operative connection with said link system and said
10 axle, means for lowering said framing on to the ground and for raising it into the travelling position consisting of a hand operated lever firmly secured to each of said axles for turning the axles together with the associated link systems, cranks
15 and wheels, a locking disk firmly secured to each of said axles, a spring balancing means connected to said carriage framing and in operative connection with said disk, and an adjustable locking

member on said framing co-operating with said locking disk.

6. A four-wheeled gun carriage comprising a framing, a front and a rear axle turnably mounted in said framing, cranks in operative connection with each of said axles at the ends thereof and forming journals for the wheels, a link system between each of said cranks and the associated axle, a spring suspension device between each of the link systems and the axle, and means for
10 lowering said framing on to the ground and for raising it into the travelling position, comprising a hand-operated lever firmly secured to each of said axles for turning the axles together with the associated cranks and wheels.
15

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