

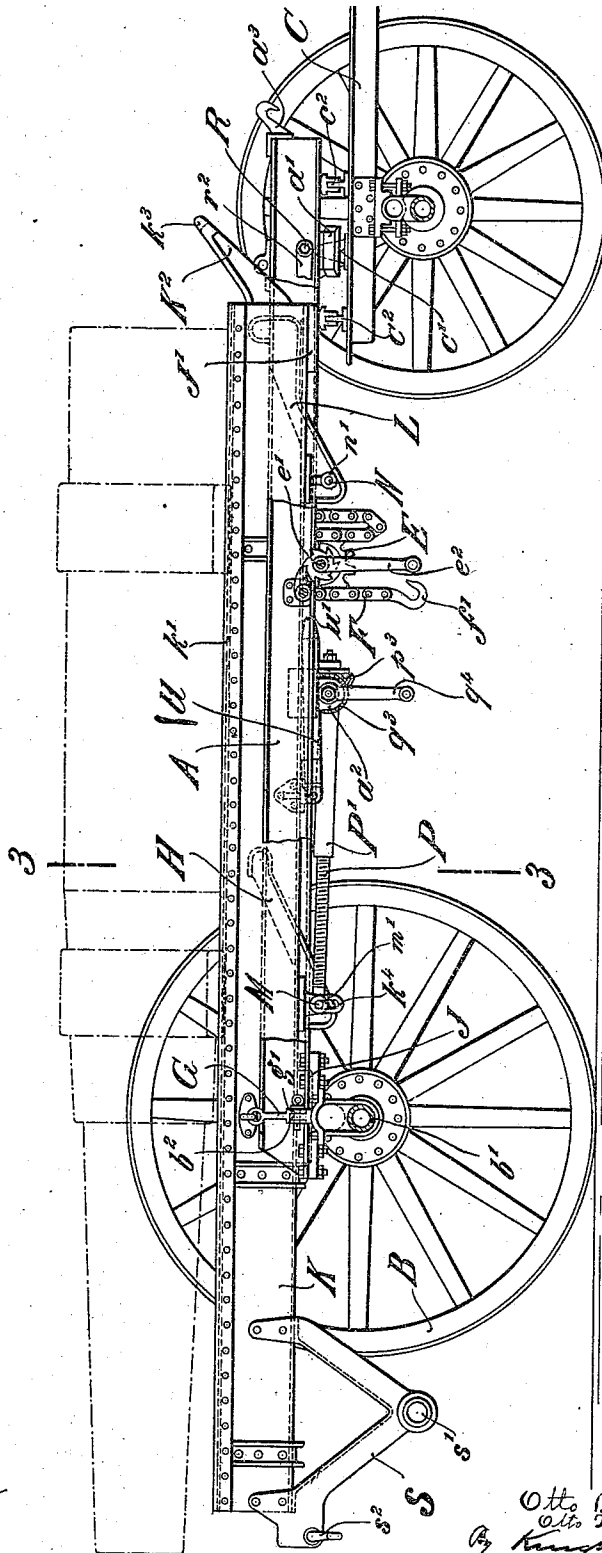
O. BEHNKE & O. TIEMANN.
 TRANSPORT CARRIAGE FOR PORTABLE GUNS.
 APPLICATION FILED DEC. 14, 1907.

932,095.

Patented Aug. 24, 1909.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
 J. M. Wynkoop
 L. R. Curitt

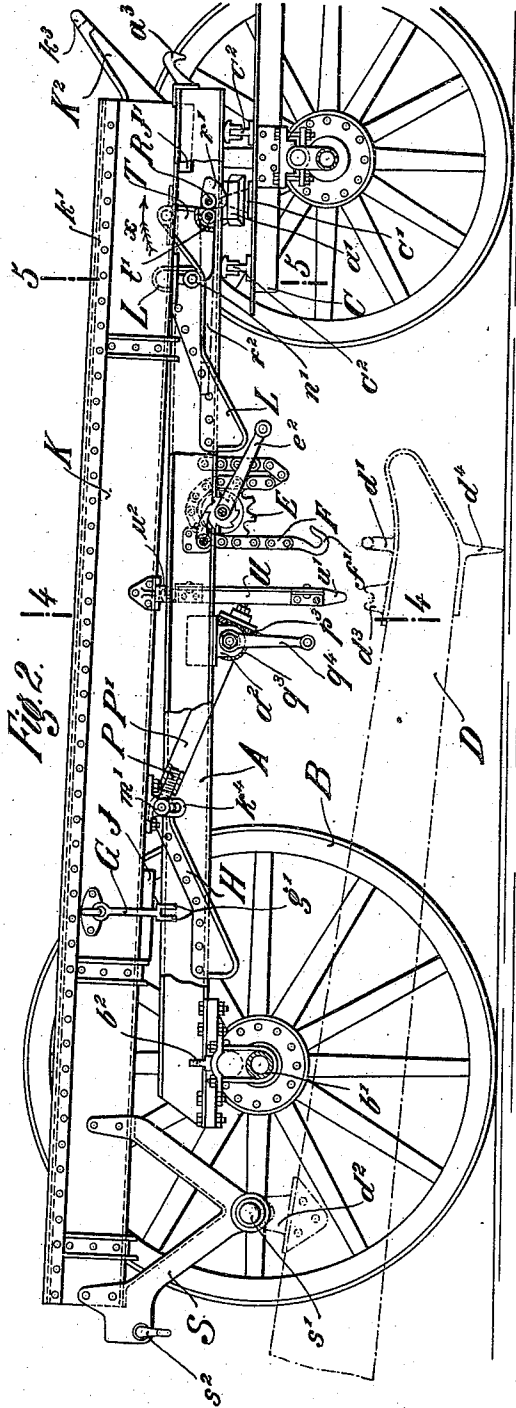
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3 SHEETS-SHEET 2



Witnesses
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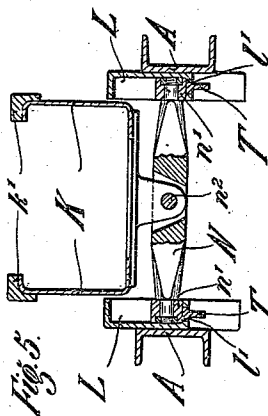


Fig. 5.

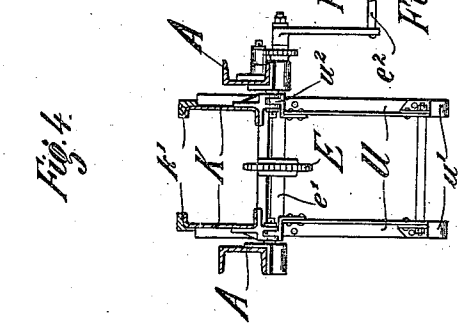


Fig. 4.

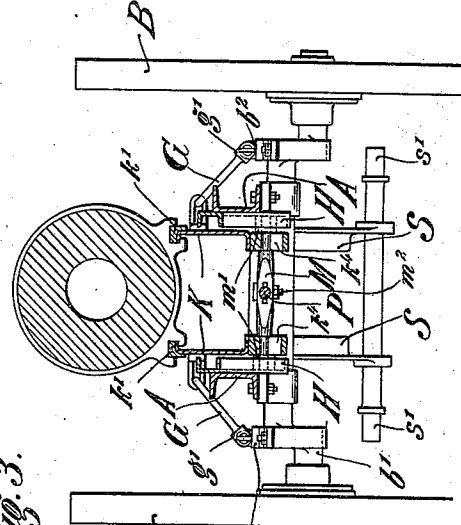


Fig. 3.

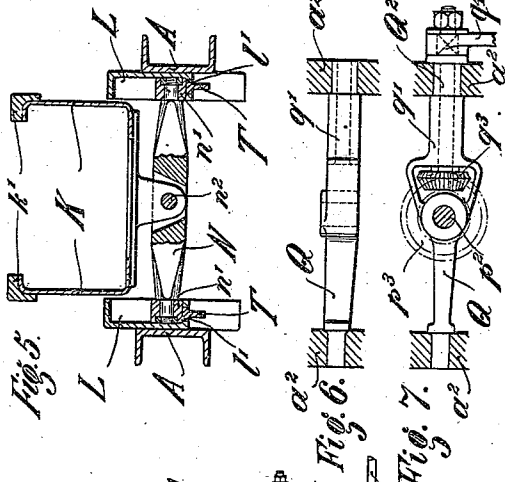


Fig. 6.

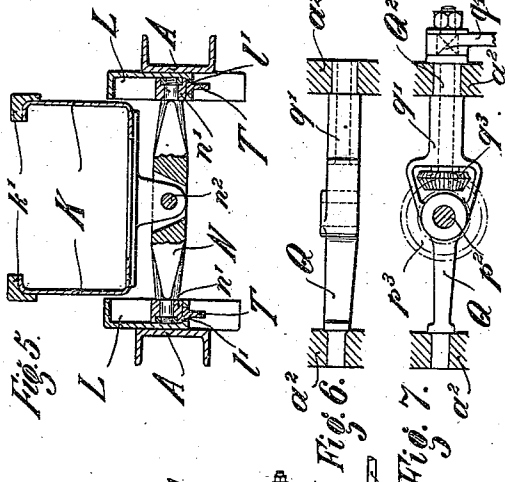


Fig. 7.

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3 SHEETS—SHEET 3.

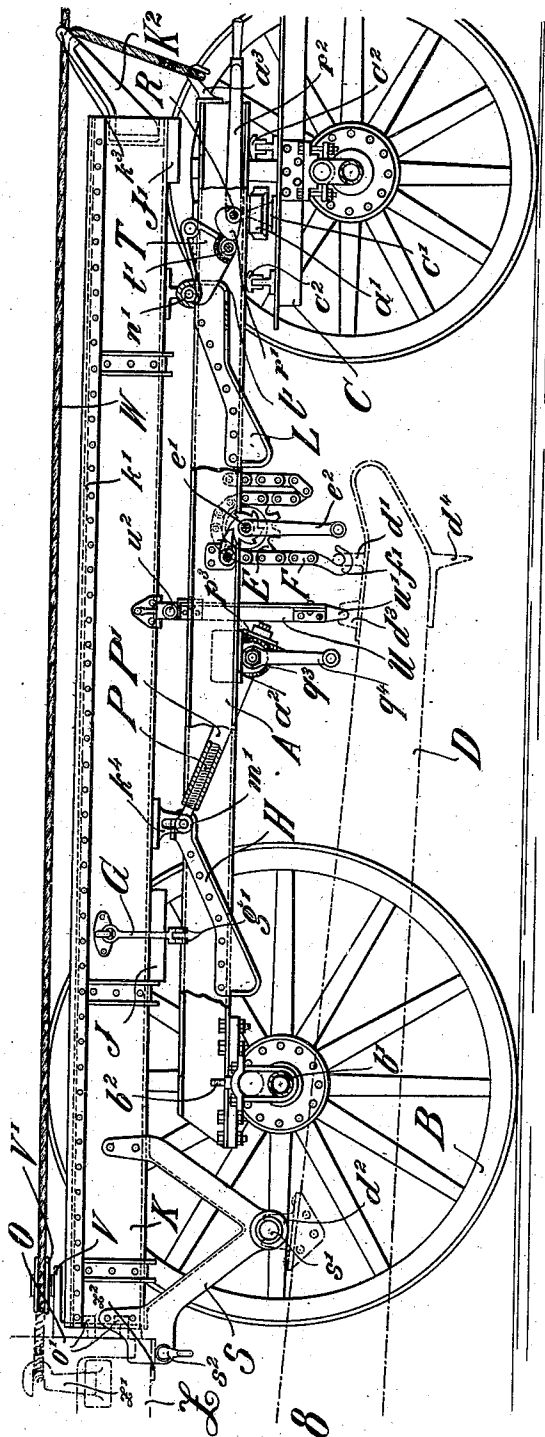


Fig. 8

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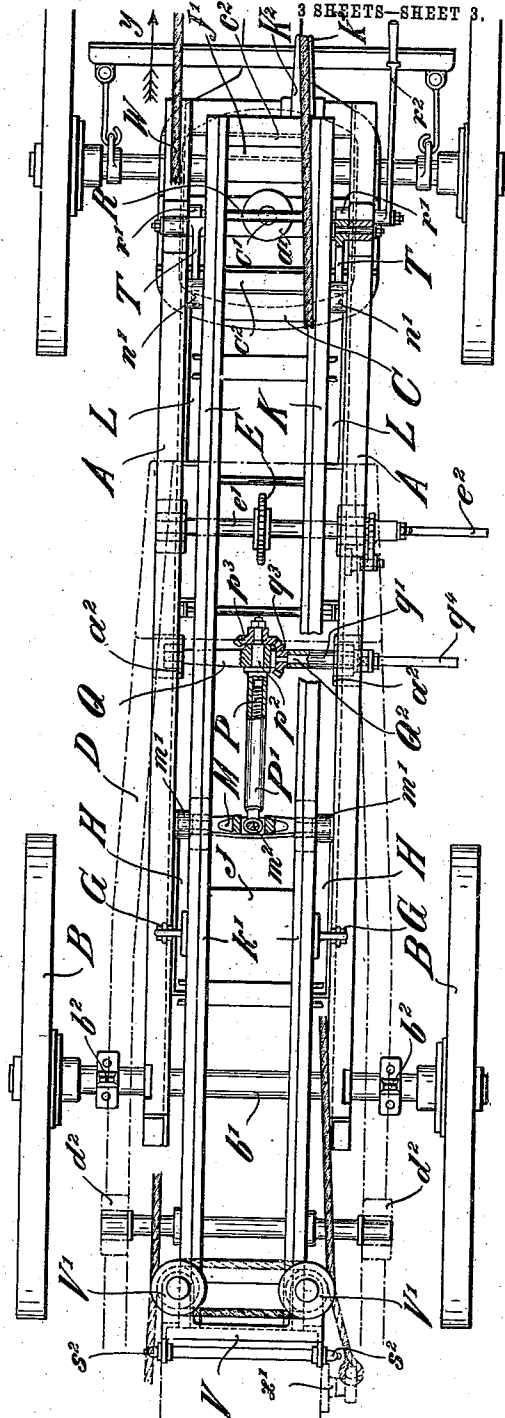


Fig. 9.

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UNITED STATES PATENT OFFICE.

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TRANSPORT-CARRIAGE FOR PORTABLE GUNS.

932,095.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed December 14, 1907. Serial No. 406,547.

To all whom it may concern:

Be it known that we, OTTO BEHNKE and OTTO TIEMANN, residing at Essen-on-the-Ruhr, Germany, both subjects of the Emperor of Germany, have invented a certain new and useful Improvement in Transport-Carriages for Portable Guns, of which the following is a specification.

The present invention relates to the type of transport gun-carriages designed for portable guns with barrel-recoil and having a slide-track corresponding with the slide-track of the service carriage of the gun (see U. S. Patent 723684).

The main object of the invention is to so improve such transport gun-carriages as to render them more secure against overturning during travel over uneven terrain or bad roads.

The accompanying drawings show one embodiment of the invention, by way of example.

Figure 1 shows the transport-carriage in side elevation; some parts being broken away and the gun-barrel being indicated by broken lines; Fig. 2 is a view corresponding to Fig. 1 with changed position of some of the parts, the trail of the service carriage being shown in broken lines; Fig. 3 is a section on the line 3—3, Fig. 1, looking from the right; Fig. 4 is a section on the line 4—4, Fig. 2, looking from the left; some parts being omitted; Fig. 5 is a section, on an enlarged scale, on the line 5—5, Fig. 2, looking from the right; Figs. 6 and 7 show a detail on an enlarged scale; Fig. 8 shows the transport-carriage in a view corresponding to that shown in Figs. 1 and 2 but with some of the parts in another position, parts of the gun being shown in broken lines; Fig. 9 shows a top view of Fig. 8.

The body A of the transport-carriage comprising two cheeks, is rigidly connected at one end with the axle b^1 of the wheels B and engages, at a point near its other end, through the medium of a pivot-bearing a^1 , with a king-bolt c^1 on the truck or turning frame C. The bolt c^1 is so mounted on the truck that a lateral swinging movement will be imparted to the body A by the swinging of the truck. To relieve the bearing a^1 of pressure, the truck C is provided with rails c^2 (see also Fig. 9) on which the carriage-body A rests. A hoisting device is arranged

on the body A and serves to raise the gun-trail D. The chain F of the hoisting device is carried over a sprocket-wheel E which carries a crank e^2 and has its shaft e^1 journaled in the cheeks of the carriage-body A. The free end of the chain F is provided with a hook f^1 for which an eye d^1 is provided on the gun-trail.

A barrel-holder K, the section of which substantially corresponds to that of the slide-track holder of the service-carriage, serves to hold the gun-barrel during the transport. Upon the upper edges of the side-walls of the barrel-holder is mounted a slide-track h^1 upon which the gun-barrel can be drawn backward after it has been disconnected from the recoil-brake and the recuperator of the gun. In the transport-carriage according to the present invention, the barrel-holder K can be brought into two different positions as regards height, relatively to the carriage body A while in the transport carriage shown in the U. S. Patent 723684 the barrel-holder is in the same position of height relatively to the body A when the gun-barrel is being shifted to the transport-carriage as it is during the travel. The barrel-holder assumes one of these positions—the receiving position—when the gun-barrel is being moved over on the slide-track h^1 (Fig. 8), while it assumes the other position—the position of travel—during the transport of the gun-barrel (Fig. 1). In the position of travel, the barrel-holder K rests, through the medium of supporting plates J J', in horizontal position between the cheeks of the carriage-body A on the axle b^1 of the wheels B and on one of the rails c^2 of the truck C. In this position, the barrel-holder can be secured against tilting through the medium of two coupling-rods G which are jointed thereto (see also Fig. 3). These rods are provided with eyes g^1 which can be coupled to eyes b^2 on the axle b^1 by means of key-bolts.

In order to make it possible to raise the barrel-holder K from the position of travel to the receiving position and again lower it from the latter position to the position of travel, the following arrangement is provided: At the bottom of the barrel-holder are arranged shafts M and N (see in particular Figs. 3 and 5) which have their ends projecting beyond the side-walls of the bar-

rel-holder K and provided with anti-friction rollers m^1 and n^1 . The inner walls of the carriage-body A are provided with two pairs of rails H and L (see in particular Figs. 2, 3 and 5) for the rollers m^1 and n^1 . The track for the rollers m^1 , which is formed by the rails H, is upwardly inclined throughout almost its entire length and is only horizontal a short distance on its upper part. The track for the rollers n^1 , which is formed by the rails L, is, however, upwardly inclined on its lower half only while the other half of the track is horizontal. The horizontal part of the rails H is located at a higher elevation than the horizontal part of the rails L. The rails H and L have their upper and lower ends bent to prevent the rollers m^1 n^1 from leaving the tracks. While the rails H have their upper ends bent in such a manner that the rollers m^1 do not possess any vertical play when they are in their uppermost position, the rails L have their upper parts formed in such a manner that the rollers n^1 , by means of a device to be hereinafter described, can be raised from the position shown in Fig. 2 to such an extent that they are situated at the same elevation as the rollers m^1 (see Fig. 8). A screw-spindle P having its threads engaging with the female threads of a draw-bar P^1 is, by means of a bolt m^2 , jointed to the center of the shaft M in the manner shown in Figs. 3 and 9. The free end of the draw-bar P^1 is formed with a pintle p^2 which is rotatably but non-slidably mounted in a cross-bar Q (Figs. 6, 7 and 9). The cross-bar Q rests in bearings a^2 on the lower side of the cheeks of the carriage-body A. The part q^1 of the cross-bar Q is provided with a longitudinal bore in which is arranged a shaft Q^2 provided with a crank q^4 . The shaft Q^2 is positively connected to the draw-bar P^1 through the medium of a pair of bevel-wheels q^3 p^3 . By turning the crank q^4 in the proper direction, the screw-spindle P can thus be screwed into or out of the draw-bar P^1 . The movement of the spindle P is partaken of by the shafts M N and the barrel-holder K, the rollers m^1 n^1 traveling along the rails H and L. By reason of the different formation of the rails H and L, the barrel-holder K assumes the inclined position shown in Fig. 2 when brought into the highest position obtainable by the turning of the crank q^4 . The barrel-holder must, as will be hereinafter described, under certain circumstances, assume this inclined position and in order to swing the barrel-holder from such position into the horizontal position, which is required for the transfer of the gun-barrel to the transport-carriage, a lifting device is provided on the carriage-body A above the truck C. The lifting device comprises a shaft R journaled in the cheeks of the carriage-body A and having two cams

r^1 and a hand-lever r^2 (Figs. 2, 8 and 9), and a pair of swinging members T which are journaled in the carriage-body A. The swinging members T are substantially of the shape of a rectangular triangle and each has a roller t^1 for engagement with the cams r^1 . The swinging members T project through a slot t^1 (Figs. 5 and 8) in the rails L and engage beneath the rollers n^1 .

The arrangement of the feet U and S provided on the barrel-holder K is substantially the same as the arrangement of the corresponding parts of the transport-carriage forming the subject matter of the U. S. Patent 723684. The feet S are extended beyond the end of the barrel-holder K and the extensions are provided with eyes which are adapted to receive a key-bolt s^2 through the medium of which each of the feet can be coupled to one of the eyes s^2 provided on the underside of the slide-track carrier Z (Fig. 8) of the service carriage. The trail of the service carriage is provided with rests d^2 d^3 for the trunnions s^1 of the feet S and for the free ends u^1 of the feet U. The feet U are jointed at u^2 to the barrel-holder and, when the barrel-holder is in the position of travel, they rest on the cross-bar Q (Fig. 1) and, when the barrel-holder is brought from the position of travel into the position shown in Fig. 2 relatively to the carriage-body A, the feet U drop by their own weight into the vertical position. In order to make it possible for the barrel-holder K to adjust itself on uneven surface to correspond to the position of the slide-track carrier of the service carriage the shaft M is mounted in slotted guides k^4 (see also Fig. 3) on the barrel-holder and the shaft N is jointed to the barrel-holder by means of a bolt n^2 in the manner shown in Fig. 5. As the shaft M in its turn can rotate in the rollers n^1 this arrangement permits of the barrel-holder K swinging both about the shaft N and about the bolt n^2 within limits defined by the length of the slots in the guides k^4 .

In order to effect the drawing backward of the gun-barrel upon the slide-track k^1 of the barrel-holder K and the transfer of the gun-barrel from the slide-track k^1 to the slide-track carrier of the service carriage, an Γ -shaped pulley-carrier V (Figs. 8 and 9) having two rope pulleys V^1 is provided. The roller-carrier can be removably secured to the horn O of the breech of the gun barrel. For this purpose the horn O is provided with hooks o^1 and the roller-carrier V has recesses in which the hooks can engage. For the rope which is to be passed around the pulleys V^1 there is provided a hook a^3 on the carriage-body A, a hook s^1 on the slide-track carrier Z of the service-carriage and a support K^2 , which is provided with a guide-groove k_3 , on the barrel-holder K.

The operation and manipulation of the

device are as follows: The empty transport-carriage, which may have its barrel-holder K in the position of travel shown in Fig. 1, is first pushed with the wheels B forward over the carriage-trail D. By means of the elevating mechanism the slide-track carrier of the service-carriage is thereupon brought into the horizontal position, the gun-barrel is disconnected from the recoil-brake and the recuperator, and the pulley-carrier V is placed on the horn O of the gun-barrel. After the rods G have been uncoupled from the axle b^1 , the barrel-holder K is then raised into the inclined position shown in Fig. 2 by turning the crank q^4 . While this takes place the feet U move into vertical position, as has already been stated. Thereupon the transport-carriage is pushed over the midst of the trunnions s^1 of the feet S and the free ends u^1 of the feet U are as nearly as possible in vertical alinement with their bearing points d^2 d^3 on the trail (Fig. 2). The travel of the transport-carriage until it is in this position relatively to the trail can be effected, by reason of the inclined position of the barrel-holder as per Fig. 2, also in case the gun stands on hard ground so as to not have the spade d^4 of the trail penetrating into the ground. This is due to the fact that, in the inclined position of the barrel-holder, the trunnions s^1 of the feet S are so much elevated from the ground that they cannot hit the rests d^2 during the movement of the transport-carriage even when the gun-trail is in the position shown in Fig. 2. After the transport-carriage has been pushed over the gun-trail the hand lever r^2 is folded in the direction of the arrow x (Fig. 2) from the position shown in dotted lines in Fig. 2 to the position shown in Fig. 8 and is locked in this position to the carriage-body A through the medium of a suitable locking device (not shown in the drawings). The folding of the hand-lever r^2 causes the barrel-holder K to be swung about the shaft M through the medium of the cams r^1 and the swinging members T. The rollers n^1 of the shaft N then assume the position shown in Fig. 8 relatively to the upper ends of the rails L. During the swinging movement of the barrel-holder caused by the folding of the hand-lever r^2 the slotted guides k^4 retain their position of elevation shown in Fig. 2 relatively to the shaft M. The barrel-holder K, therefore, still rests on the shaft M, the latter abutting against the upper end walls of the slots in the guides k^4 . After the hook f^1 of the chain F has been inserted in the eye d^1 of the trail D the crank e^2 is then turned to raise the trail D until the trunnions s^1 of the feet S and the ends u^1 of the feet U engage in the rests d^2 d^3 . The barrel-holder is then, in a manner similar to that described in the Patent No. 723,684, brought into such a po-

sition that its track k^1 forms a rectilinear extension of the track of the service-carriage. While this takes place there is generally some movement between the slotted guides k^4 of the barrel-holder and the shaft M. When the gun-trail has been raised the parts of the transport-carriage assume the relative position shown in Fig. 8 in which the barrel-holder K is coupled to the slide-track carrier of the service-carriage through the medium of the key-bolt s^2 . A rope W is thereupon secured to the hook a^3 and passed over the support K^2 and the pulleys V^1 in the position shown in full lines in Figs. 8 and 9. By a pull on the free end of the rope W in the direction of the arrow y (Fig. 9) the gun-barrel is then drawn backward upon the slide-track k^1 of the barrel-holder K. When the gun-barrel has been moved backward the coupling between the barrel-holder K and the slide-track carrier of the service-carriage is disconnected and the gun-trail D is again lowered to the ground by means of the hoisting device E F. While this is being done, the barrel-holder K descends toward the service carriage to such an extent that the upper end walls of the slots of the guides k^4 again rest on the shaft M. The lever r^2 is thereupon shifted to again bring the barrel-holder into the inclined position shown in Fig. 2 and the crank q^4 is turned to lower the barrel-holder to the position of travel shown in Fig. 1 in which the barrel-holder is coupled to the axle b^1 by means of the rods G. The gun-barrel may then be transported away upon the transport-carriage.

When the gun-barrel is to be transferred from the barrel-holder K to the slide-track carrier of the service carriage the rope W is secured to the hook z^1 of the slide-track carrier and is passed over the rollers V^1 in the manner shown in dotted lines in Fig. 9.

It will be understood from the foregoing description that the center of gravity of the loaded transport-carriage is located considerably deeper during the transport than in the transport-carriage of the Patent 723684, which during the transport of the gun-barrel has its slide-track located at the same elevation as when the gun-barrel is being transferred to the transport-carriage. The present transport-carriage, therefore, presents a better guarantee against upsetting when traveling on uneven terrain or bad roads than does the transport-carriage of the aforesaid patent.

Having thus described the invention what is claimed and desired to be secured by Letters Patent is:

1. In a transport gun-carriage, the combination with a slide-track adapted to receive the gun-barrel from its service carriage; of means for lowering the slide-track on the carriage to bring the center of gravity of the gun relatively low during transport,

said means being adapted to lower one end of the slide-track relatively to the other without imparting a lateral tilt to the same.

2. A transport gun-carriage having a slide-track for the gun-barrel, means for imparting vertical bodily adjustment to the slide-track on the carriage, and means for adjusting the height of one end of said slide-track relatively to the other end of the same.

3. A transport gun-carriage having a slide-track adapted to be brought into alinement with the slide-track of the service carriage to receive the gun-barrel therefrom, and means for lowering the slide-track bodily from its alined position, and means for interrupting the lowering movement of one end of the slide-track.

4. A transport gun-carriage provided with a slide-track having one end independently adjustable to receive the gun-barrel from its service carriage, and means for vertically adjusting the other end of the slide-track.

5. A transport gun-carriage provided with a slide-track, means whereby both ends of the slide-track may be adjusted vertically on the carriage, and means whereby an additional adjustment may be imparted to one end.

6. A transport gun-carriage comprising a carriage-body provided with inclined guides, and a slide-track having means engaging in said guides to permit the track to be adjusted vertically relatively to the carriage-body, and means for moving the slide-track bodily in a longitudinal direction.

7. A transport gun-carriage comprising a carriage-body, inclined guide-rails on said body, a slide-track having bearing on said guide-rails, and means for moving the track longitudinally on the rails to vertically adjust the track relatively to the carriage-body, and one end of said slide-track relatively to the other end thereof.

8. A transport gun-carriage comprising a carriage-body having inclined guides spaced from each other longitudinally of the body and of different length of inclination, a slide-track having bearing in said guides, means for moving the track on the guides to vertically adjust the track, and means for imparting additional vertical adjustment to that part of the track moving on the guides having the lesser length of inclination.

9. A gun-carriage, comprising a service carriage having a slide-track, a transport-carriage also having a slide-track corresponding to the slide-track of the service carriage and constructed to be alined therewith, and means for sliding the gun-barrel from the track of the service carriage backward upon the track of the transport carriage; said means comprising a pulley-carrier having a connection with the gun-barrel whereby it may be easily attached thereto and detached therefrom, pulleys mounted in

said carrier, and a rope passing around said pulleys and having one end adapted for connection to the gun-barrel.

10. A transport gun-carriage comprising a carriage-body, a slide-track, means for moving the slide-track longitudinally to impart a vertical and tipping adjustment to the slide-track relatively to the carriage-body, and means for coupling the slide-track to the carriage-body when the carriage is in position for transport.

11. A transport gun-carriage having a slide-track, means for supporting the slide-track in a position to receive the gun-barrel from its service carriage, means for supporting the slide-track in a position of transport relatively lower than the receiving position, and means for moving the slide-track longitudinally to transfer it by an interrupted vertical movement from one of the supporting means to the other.

12. A transport gun-carriage having a slide-track adapted to receive a gun-barrel from its service carriage; a pair of inclined tracks for transferring one end of the slide-track from a higher to a lower level; a second pair of inclined tracks for transferring the other end of said slide-tracks from one level to another; and a cam engaging said other end of the slide-tracks to impart an additional movement thereto.

13. A transport gun-carriage having a slide-track, means for supporting each end of the slide-track at a relatively high position on the carriage to present the track in position to receive the gun from the service carriage, means for supporting each end of the slide-track at a relatively lower position on the carriage, to lower the center of gravity during transport, and transferring means converting a longitudinal movement of the slide-track into a movement from the higher position to the lower, and vice-versa; the transferring means for one end of the track being constructed to interrupt the vertical movement at that end during a part of the transfer.

14. A transport gun-carriage having a slide-track and means elevating said slide-track into different horizontal planes above said gun-carriage; and means for returning the slide-track to its normal lowered position on the carriage to bring the center of gravity of the gun relatively low, said carriage being adapted to have the gun in its lowered position during transport to increase stability.

15. In a transport gun-carriage, the combination with a slide-track for the gun-barrel; of means for raising and lowering said slide-track to different elevations upon the gun carriage, said slide-track being adapted when in elevated position to receive the gun-barrel; and means adapting the slide-track to rest in its lowered position during transport.

16. In a transport gun-carriage, the combination with the carriage; of a slide-track adapted to be brought into positions of different elevation and alinement with the slide-track of the service carriage when in its uppermost position to receive the barrel therefrom; and means for lowering the slide-track bodily from its alined position, said carriage being adapted to have its slide-track in the lowered position during transport.

17. In a transport gun-carriage, the combination with a slide-track and means whereby the ends of the slide-track may be brought to different respective elevations; of a carriage permitting said slide-track to be raised to receive the gun and to occupy its lowered position during transport.

18. A transport gun-carriage comprising a carriage-body provided with inclined guides, and a slide-track engaging in said guides to permit vertical adjustment relatively to the carriage-body to occupy different horizontal planes, said carriage-body being constructed to permit the slide-track to receive the gun-barrel when elevated and to occupy its lowered position during transport.

The foregoing specification signed at Düsseldorf, Germany, this fifth day of November, 1907.

OTTO BEHNKE.
OTTO TIEMANN.

In presence of—
WILHELM FLASCHE,
CLEMENS HECKMANN.