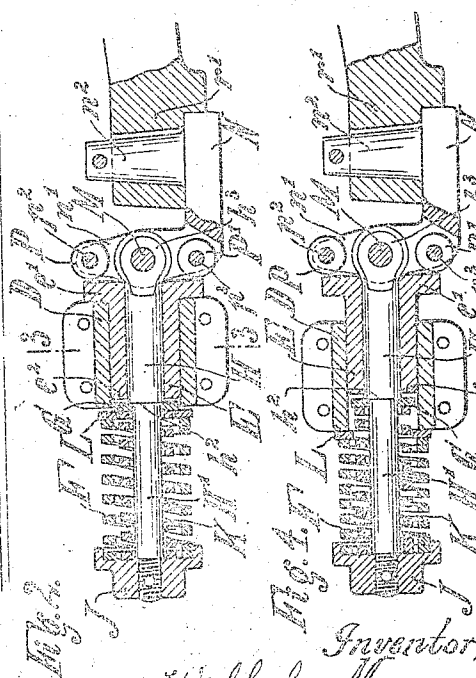
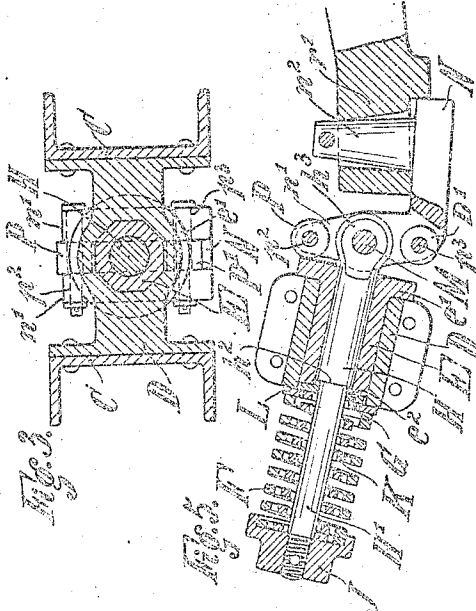
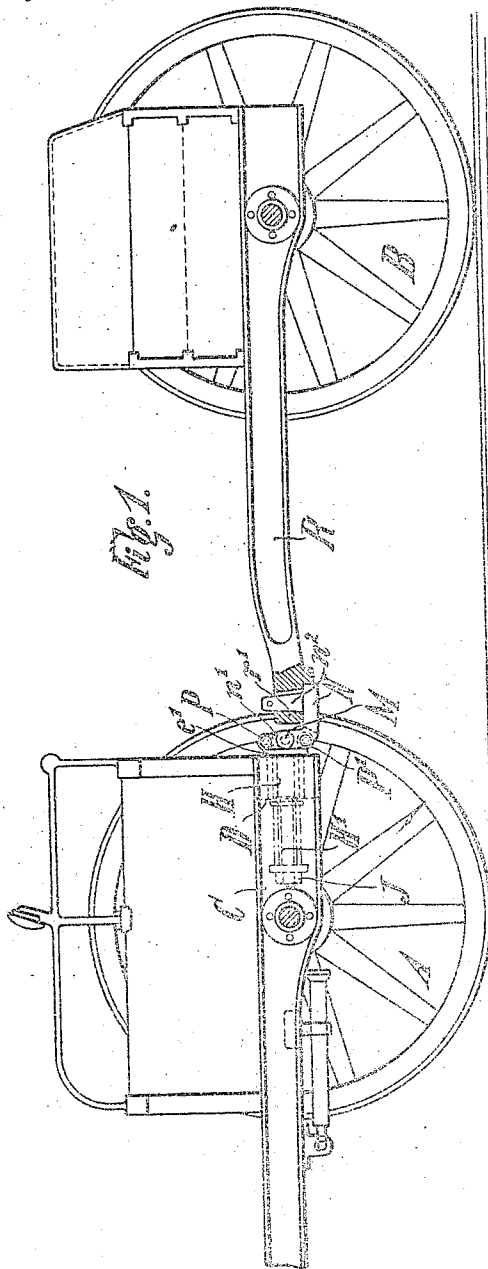


W. MAYER.
 LIMBER COUPLING FOR ARTILLERY VEHICLES.
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1,045,720.

Patented Nov. 26, 1912.



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LIMBER-COUPLING FOR ARTILLERY-VEHICLES.

1,045,720.

Specification of Letters Patent.

Patented Nov. 26, 1912.

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To all whom it may concern:

Be it known that I, WILHELM MAYER, a subject of the Emperor of Germany, and a resident of Essen-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Limber-Couplings for Artillery-Vehicles, of which the following is a specification.

This invention relates to limber couplings for artillery vehicles and more particularly to such limber couplings in which a member, a limber hook for instance, is mounted to swing on a tension rod, and is, by spring pressure, made to press against an abutment. This arrangement has been made in order to relieve the horses from the limber pole pressure, and to lessen the chattering of the limber pole. To attain this object in the most complete manner, the spring, that presses the limber hook against the abutment must be made very strong. In that case the spring will, however, produce a considerable resistance against any movement of the limber hook in the axial direction of the tension rod, so that the thrust, acting in the line of draft, will not be taken up with enough elasticity by the spring to act as horse protector.

The object of the present invention is to provide an improved limber coupling of the above mentioned kind, of simple and compact construction, able to carry the limber pole pressure and to diminish the chattering of the limber pole, but at the same time to act as horse protector in the line of draft.

One embodiment of the invention is represented in the drawings, wherein,

Figure 1 shows a side view of an artillery vehicle, comprising limber and caisson with the limber coupling, partly in section; Fig. 2 a longitudinal, vertical section in larger scale of the limber coupling; Fig. 3 a section on line 3—3 of Fig. 2 seen from the left; Fig. 4 same view as Fig. 2 with parts in different position, and Fig. 5 another view like Fig. 2 but with parts in a still different position.

A is a two wheeled limber coupled together with the caisson B. At the rear end of its framework C and rigidly connected thereto, the limber has a bearing block D,

in which a sleeve E is carried, Figs. 1 and 3. The sleeve E is slidably, but not rotatably mounted in the bearing block D, and it is provided with a collar e^1 , compare Fig. 3, with which it normally rests against the bearing block D. A tension rod composed mainly of two cylindrical parts H and H¹ of different diameter, is, with its heavy end H carried in the cylindrical bore of the sleeve E. An eye h^2 is provided at the rear end of the heavy part H of the tension rod for the limber hook N, which is hinged thereto by means of a pin M. The shoulder h^2 of the tension rod H H¹ is in the position of the parts shown in Figs. 2 and 4 situated a little in advance of the front face e^2 of the sleeve E. The tension rod has at the free end of its lighter part H¹ a stop nut J against which the forward ends of two springs F and K, one situated outside the other, are resting. The rear end of the inner spring K abuts against a washer G, which normally rests against the shoulder h^2 of the tension bar H H¹ but may also at times stop against the front face e^2 of the sleeve E. The outside diameter of the washer G is larger than the outside diameter of the spring K. The rear stop for the outer spring F is a washer L so constructed, that it may rest against both the washer G and the bearing block D.

The limber hook N has a fork shaped head piece, between the prongs n^1 of which the eye h^2 of the tension rod H H¹ as well as two rollers P and P¹ are situated, carried by bolts p^2 and p^3 , the axes of which are parallel with the axis of the pin M. The rollers P and P¹ are adapted to rest against the collar e^1 of the sleeve E. The limber hook N has a pintle n^2 for the eye p^1 of the caisson pole R, between which pintle and eye only slight play is allowed.

Before limbering up, the different parts of the coupling situated on the limber A will assume the position indicated in, for instance Fig. 2. The springs F and K are under powerful compression. The washer G is pressed against the shoulder h^2 of the tension rod H H¹ and the washer L against the washer G. A small play exists between the washer G and the front face e^2 of the sleeve E on the one hand, and between the

washer L and the bearing block D on the other hand. This play may also appear between the collar e^1 of the sleeve E and the bearing block D or between the collar e^1 and the rollers P and P¹. As a consequence of this play, a turning of the limber hook N, together with the tension rod H H¹ relative to the sleeve E and the bearing block D can take place without resistance of the springs F and K, when such turning between these parts will be found necessary on limbering up on uneven ground.

In traveling over level ground, the parts of the limber coupling take up practically the relative positions illustrated in Fig. 2. The washer L only moves up against the bearing block D, so that the draft of the horses, by means of this bearing block, the spring F, and so forth, is transmitted to the caisson B. Should now, during the traveling, a jerk occur in the opposite direction of travel, as for instance by the striking of the caisson against an obstruction on the ground, the limber hook N, together with the tension rod H H¹ and the sleeve E will be drawn to the rear in the bearing block D, the spring F only being compressed and acting thus as horse protector. Fig. 4.

Should the pole of the limber, which is rigidly connected with the limber framework C, be thrown upward during travel over uneven ground, the limber hook N will approximately retain its position relative to the eye n^1 , as the pintle n^2 has only slight play in the eye n^1 . The tension bar H H¹ will, however, swing upward around the axis of the pin M relative to the limber hook whereby the collar e^1 of the sleeve E will be pressed against the roller P, but at the same time raised from the roller P¹, see Fig. 3, and the tension bar will be drawn rearward relative to the bearing block D and the sleeve E. The collar e^1 as well as the washer L now rest against the bearing block D, and the washer G against the front face e^2 of the sleeve E; so that, by the above mentioned displacement of the tension rod H H¹, both springs F and K are compressed and, as a consequence, the blow of the limber pole will be considerably diminished. The same thing will also occur, and need no further explanation, when the limber pole is thrown downward, or when, before the swinging of the pole upward or downward, the parts of the limber coupling have taken the position shown in Fig. 4 from the action of a blow in the opposite direction of travel.

The arrangement of the rollers P and P¹ on the limber hook, provides a frictionless displacement between the limber hook N and the collar e^1 of the sleeve E during the swinging of the limber pole.

It is evident that a gun carriage may take the place of the caisson, without interfering with the object of this invention, or the po-

sition of the coupling may be reversed so that the eye is attached to the limber and the limber hook to the caisson.

I claim:—

1. A limber coupling for artillery vehicles, comprising a housing, a tension rod, a draw hook pivoted on said tension rod, a sleeve bearing for said tension rod, a set of springs tending to press said draw hook against said sleeve bearing and adapted to produce a greater resistance on the bending of said draw hook relative to the tension rod than will be produced by the displacement of said draw hook in the axial direction of said tension rod.

2. A limber coupling for artillery vehicles, comprising a tension rod, a draw hook, pivoted on said tension rod, a sleeve bearing for said tension rod, a housing for said sleeve bearing rigidly connected to the vehicle, two springs tending to press said draw hook against the sleeve bearing; abutments for said springs adapted to cause the compression of both springs when a bending takes place between said tension rod and said draw hook, but the compression of only one spring when a displacement takes place of said draw hook in the axial direction of said tension rod.

3. A limber coupling for artillery vehicles, comprising a tension rod, a draw hook pivoted on said tension rod, a sleeve bearing for said tension rod, a housing for said sleeve bearing rigidly connected to the vehicle, two springs tending to press said draw hook against the sleeve bearing, an abutment at one end of said tension rod common to both springs, a washer between one of said springs and said sleeve bearing, a second washer between the other spring and said housing.

4. A limber coupling for artillery vehicles, comprising a tension rod, a draw hook pivoted on said tension rod, a sleeve bearing for said tension rod, a housing for said sleeve bearing rigidly connected to the vehicle, two helical springs, one mounted inside the other around said tension rod and tending to press the draw hook against the sleeve bearing, a stop for said springs at one end of said tension rod; a washer on said tension rod adapted to rest against a shoulder on the tension rod or against said sleeve bearing alternately or simultaneously; a second washer adapted to rest against the first washer or against the housing alternately or simultaneously; one of said springs being held in compression between said stop and the first of said washers; the other spring between the same stop and the second of said washers.

5. A limber coupling for artillery vehicles, comprising a tension rod; a draw hook, pivoted on said tension rod; a sleeve bearing for said tension rod; a housing for said

sleeve bearing rigidly connected to the vehicle; two springs tending to press said draw hook against the sleeve bearing; a set of rollers carried by said draw hook adapted
5 to lessen the friction between said draw hook and said sleeve bearing when the hook is pressed against said sleeve bearing.

6. A limber coupling for artillery vehicles, comprising a tension rod; a draw hook,
10 pivoted on said tension rod; a sleeve bearing for said tension rod; a housing for said sleeve bearing rigidly connected to the vehicle; two springs tending to press said draw hook against the sleeve bearing; the free

end of said tension rod being of smaller diameter than the part carried in the bearing; the length of said sleeve bearing being made slightly shorter than the length of the part
20 of the tension rod having the larger diameter.

The foregoing specification signed at Barmen, Germany, this 30th day of September, 1911.

WILHELM MAYER. [L. s.]

In presence of—

ALBERT J. NUFER,
L. NUFER.