To all whom it may concern:

Be it known that I, GUSTAV A. SCHOELLER, a citizen of the German Empire, residing at 2 Gustavstrasse, Mulheim-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Ammunition Conveyers or Rammers for Guns, of which the following is a specification.

My present invention has reference to improvements in ammunition conveyers or ram- mers, and particularly to the construction shown and described in my prior patent, No. 631,999, dated August 29, 1899; and it has for its object to prevent the possibility of one of the rack-bars being prematurely carried forward by the friction produced by the adjacent forwardly-moving rack-bar.

With this object in view my invention consists, essentially, in an ammunition conveyor or rammmer for guns comprising a series of rack-bars successively connected, means for moving the same successively forward, automatic couplers connecting the bars in succession during their forward movement and un- coupling the same at the end of the reverse movement, pawls carried by the rack-bars and adapted to positively engage with rigid abutments when the rack-bars are telescoped, and means adapted to engage with said pawls at the end of the forward movement of the respective rack-bars for releasing the pawls from the abutments in succession.

The nature of my invention will best be understood when described in connection with the accompanying drawings, in which—

Figure 1 represents a plan or top view of the conveyer and showing the rack-bars telescoped within the casing, the cover being cut away. Fig. 2 is a similar view showing the rack-bars in their extended positions. Fig. 3 is a sectional plan or top view, on an enlarged scale and part broken away, of the casing and operating parts and showing the arrangement of the pawls, it being assumed that the first rack-bar has been carried outwardly to its limit. Fig. 4 is a vertical section on the line 4-4, Fig. 5 is a vertical section on the line 5-5, Fig. 1. Figs. 6, 7, and 8 illustrate modifications.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

The general construction of the conveyer is the same as that described in my prior patent, No. 631,999, previously referred to, which describes a conveyer consisting of a housing A, a series of rack-bars B, B', B", and B", successively connected, a pinion C, adapted to move said rack-bars forwardly in regular succession, and automatic couplings f, f', f", and f", connecting the bars in succession during their forward movement out of the housing and uncoupling the same when pushed into the latter. In said prior construction the rack-bars were held against outward movement until the proper time for advancement by spring-bolts located on the casing and engaging abutments on the rack-bars, said spring-bolts being moved away from the abutments and against the action of their springs by the pull of the pinion transmitted from the respective rack-bar engaged by the pinion to the next succeeding rack-bar by a pin-and-slot connection of said rack-bars.

In the example illustrated in the present application I have substituted positive locking and unlocking means for the several rack-bars in place of the yielding bolts and abutments of the prior patent, which I shall now proceed to describe.

On the forward portions of the rack-bars B, B', B", and B" alternately on the left and the right side cheeks thereof are mounted pawls D, D', D", and D", having the form of two-armed levers and adapted to turn about pivots L, L', L", and L" carried by the respective rack-bars. When the several rack-bars B, B', B", and B" have been pushed into the housing A, the forward arms of the pawls D, D', D", and D" are in engagement with abutments M, M', M", and M". The abutments M, M', and M" are formed on the rack-bars B, B', and B" respectively, while the abutment M'" is attached to or formed on the housing A. Suitable springs H, H', and H" attached to the rack-bars B, B', and B" respectively, force the pawls D, D', D", and D" into engagement with the abutments M, M', and M" when the parts are telescoped, as shown in Figs. 1 and 3, and when said pawls are in engagement with said
abutments their rear arms are in the paths of upwardly-projecting trippets \( N', N'', \) and \( N''', \) attached or formed on the rear ends of the rack-bars \( B', B'', \) and \( B''' \) and having their contact-faces tapered toward the front.

When the rack-bars are telescoped into the housing, as shown in Fig. 1, the several pawls \( D', D'', \) and \( D''' \) are in engagement with their corresponding abutments \( M', M'', \) and \( M''' \), and consequently the rack-bar \( B' \) cannot be moved with respect to rack-bar \( B'' \), the latter cannot be moved with respect to the rack-bar \( B''' \), and rack-bar \( B''' \) cannot be moved forward with respect to the housing \( A \). All the rack-bars, with the exception of the leading rack-bar \( B''' \), are therefore coupled with the housing \( A \) in view of the engagement of pawl \( D''' \) with the abutment \( M''' \) and are prevented from being moved or displaced forward. If now the rack-bar \( B' \) is moved outwardly by turning the gear wheel or pinion \( C \) the trippet \( N' \) engages with the rear arm of the pawl \( D' \) when the said rack-bar is at the latter end of its movement and turns the said pawl against the pressure of the spring \( H' \) and lifts the forward arm of said pawl away from the abutment \( M' \). (See Fig. 3.) This action unlocks the rack-bar \( B''' \), and it is then moved outwardly by the gear wheel or pinion \( C \) in the manner described in my prior patent, while the rack-bars \( B'' \) and \( B''' \) are still locked in position. The successive release of the latter two rack-bars is effected in the same manner as that of the rack-bar \( B' \), the trippets \( N'', N''' \) successively engaging with the pawls \( D'' \) and \( D''' \), so that finally the conveyer or rammer can be brought to its fullest extended position, as shown in Fig. 2. When the rack-bars are again telescoped into the housing \( A \), the pawls \( D', D'', \) and \( D''' \) fall successively into engagement with their respective abutments in the order mentioned as soon as the rack-bars \( B', B'', \) and \( B''' \) begin to enter the housing in the succession named—that is to say, when said pawls are released by the retrograde movement of the trippets \( N', N'', \) and \( N''' \).

The means for causing the engagement and the release of the pawls may be varied in numerous ways without changing the principle of my invention. For example, the projecting trippets may be omitted and the pawl-springs \( H', H'', \) and \( H''' \) so arranged that they have a tendency to lift the pawls away from their abutments, Fig. 6. The engagement of the pawls with the abutments is then insured by having the side of the preceding rack-bar adapted to engage with the adjacent pawl to hold the same in contact with the abutment throughout nearly the entire stroke of the preceding rack-bar, which latter is provided at or near its rear end with a recess \( O', O'', \) or \( O''' \), that comes opposite to the pawl at the end of the outward movement of said rack-bar. Said recess permits the spring to force the pawl outwardly and into the recess, thus releasing the next succeeding rack-bar.

The pawl-springs may be entirely omitted if the preceding rack-bar engages with the front arm of the pawl in the manner previously described, and the trippet \( N', N'', \) or \( N''' \) is arranged to act on the rear arm of the pawl at the instant when the front arm of the pawl is opposite the recess \( O', O'', \) or \( O''' \) in the rack-bar, Fig. 7. The pawl-spring may also be omitted, as shown in Fig. 8, by providing the pawl with a pin \( a \), adapted to engage with a groove \( b \), cut into the preceding rack-bar, which groove runs in a straight line parallel to the longitudinal axis of the conveyer for the greater portion of its length and terminates near the end of the rack-bar in an inclined portion \( c \). So long as the pin on the pawl runs in the straight portion of the groove the pawl is in engagement with the corresponding abutment. When, however, the pin enters the inclined portion of the groove, the pawl is lifted away from the abutment and the corresponding rack-bar released.

It will readily be understood that the several abutments can be replaced by a set of abutments attached to the top or bottom wall of the housing.

What I claim as new is—

1. In an ammunition conveyer or rammer for guns having a series of rack-bars telescopically connected and means for moving the same successively forward, the combination of pawls carried by the rack-bars, rigid abutments adapted to be engaged by the said pawls when the rack-bars are telescoped for positively holding the same against advance movement, and means on the rack-bars for successively causing the release of the pawls from the abutments at the end of the forward movements of the rack-bars, substantially as described.

2. In an ammunition conveyer or rammer for guns having a series of rack-bars telescopically connected and means for moving the same successively forward, the combination of spring-pressed pawls carried by the rack-bars, rigid abutments adapted to be engaged by said pawls when the rack-bars are telescoped for positively holding the same against advance movement, and trippets situated at the ends of the rack-bars and adapted to successively engage with the pawls at the end of the forward movements of the rack-bars to lift the pawls from the abutments, substantially as described.

3. In an ammunition conveyer or rammer for guns having a series of rack-bars telescopically connected and means for moving the same successively forward, the combination of pawls and abutments alternately mounted on the rack-bars, an abutment on the casing adapted to be engaged by the pawl on the last rack-bar, and means for tripping said pawls, substantially as described.

4. The combination of an ammunition conveyer or rammer for guns having a system of rack-bars telescopically connected and means for distending the system, of interlock-
ing means for said rack-bars and the housing for positively locking the rack-bars, with the exception of the leading rack-bar, against advance movement, and means for automatically and successively unlocking the following rack-bar when the preceding rack-bar has reached the end of its movement, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GUSTAV A. SCHÖELLER.

Witnesses:

WILLIAM ESSENWEIN,

M. ESSENWEIN.