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G. W. VON HOFE ET AL
MEANS FOR HANDLING AMMUNITION

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2 Sheets-Sheet 1

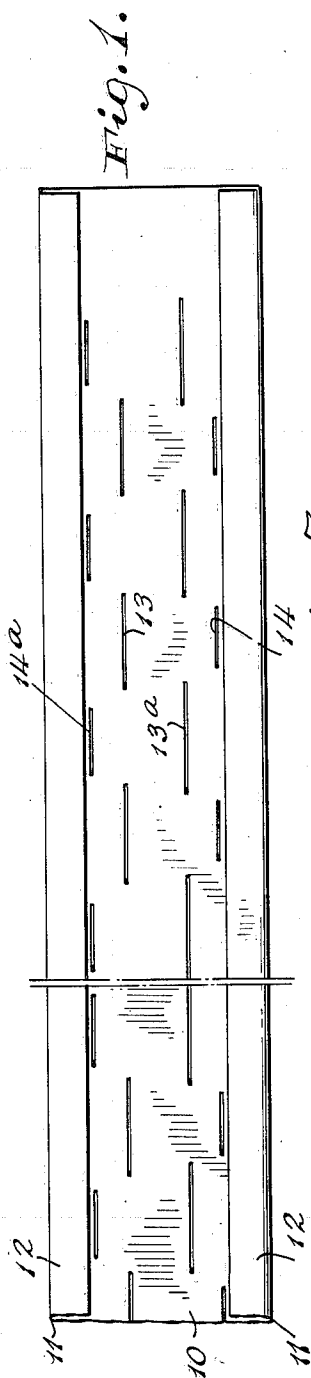


Fig. 3.

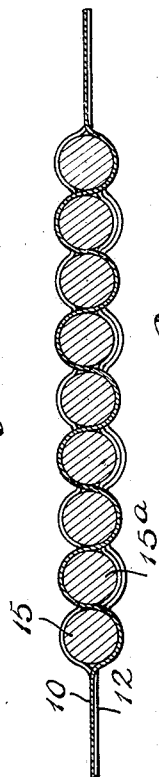
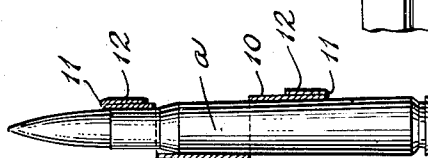
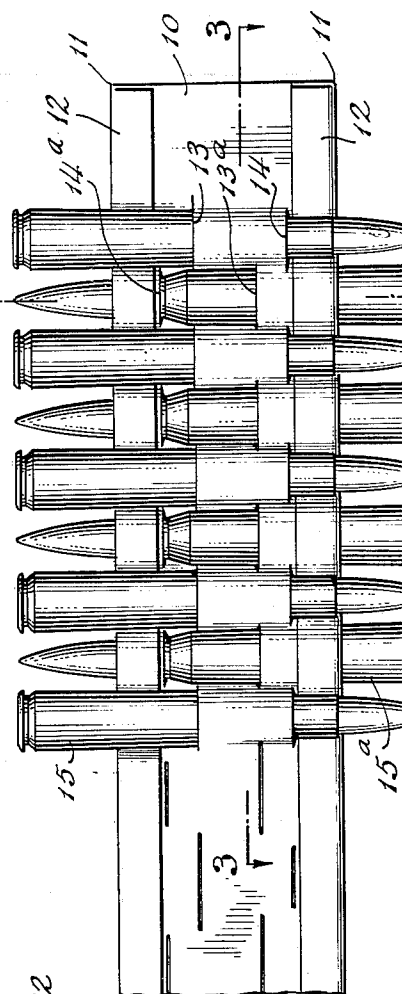


Fig. 2.



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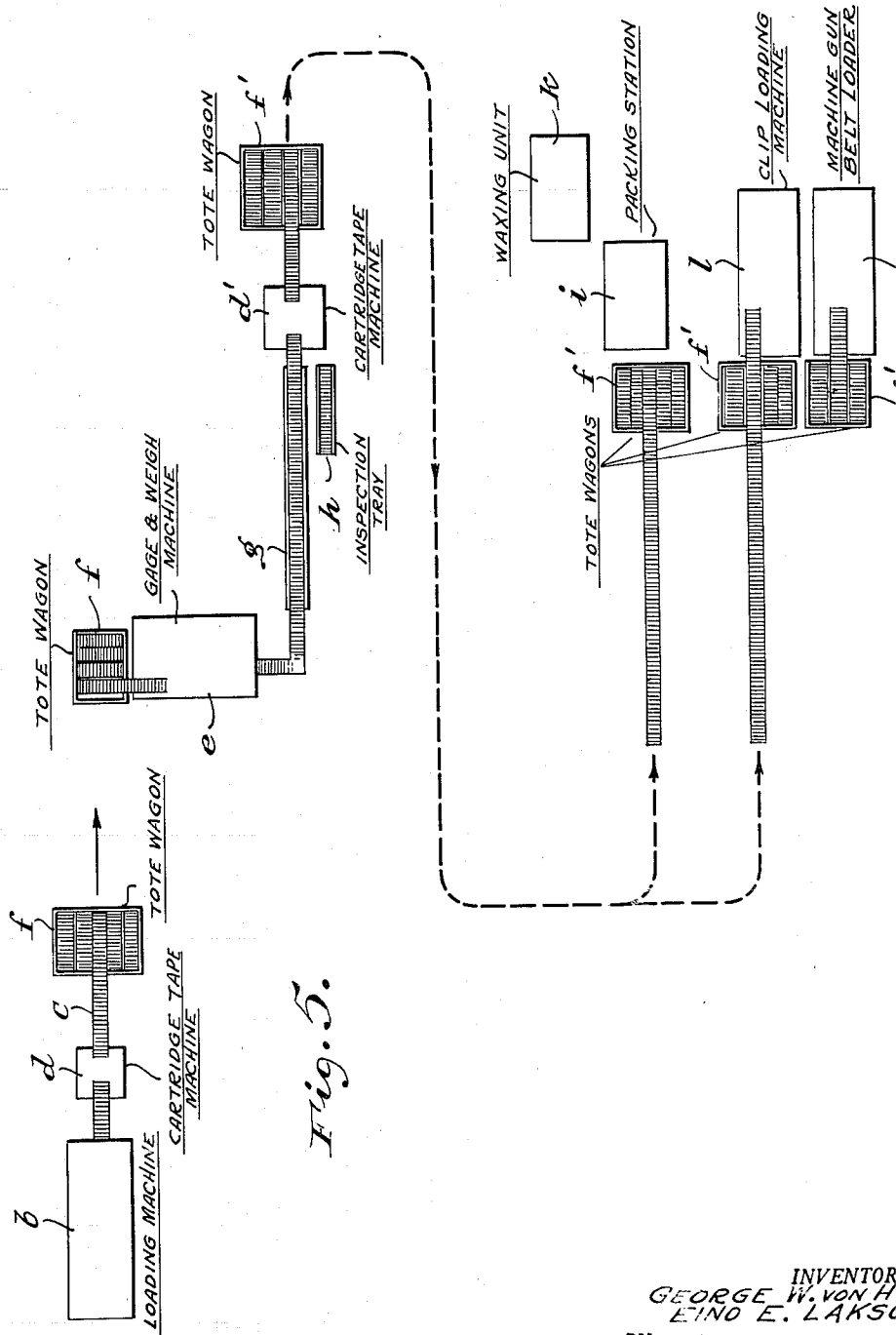
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MEANS FOR HANDLING AMMUNITION

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1 Claim. (Cl. 206—79)

The invention relates to methods of and means for handling ammunition and more particularly ammunition in the form of cartridges for various types of firearms.

The object of the invention is to provide a novel method whereby the handling of the indicated type of ammunition is greatly simplified and whereby many of the handling steps necessary in existing methods are entirely eliminated with consequent savings in manpower and equipment cost.

The invention contemplates further a novel method whereby the handling of the ammunition is effected with maximum efficiency and with a saving in transportation and storage space and without requiring the use of critical materials or commodities.

A further object of the invention is to provide a novel method of handling the indicated ammunition in a manner to simplify and improve the feeding thereof to customary or clip loaders whether this step takes place at a manufacturing arsenal or at a plant distant therefrom.

The invention further has for its object the provision of novel means whereby the novel method may be carried out with efficiency and with minimum manpower and equipment.

Other objects will appear from the description hereinafter and the features of novelty will be pointed out in the claim.

In the accompanying drawings which illustrate examples of the invention without defining its limits,

Fig. 1 is a face view of the novel handling means in its initial stage;

Fig. 2 is a corresponding view of said handling means at a subsequent stage;

Fig. 3 is a longitudinal section on the line 3—3 of Fig. 2;

Fig. 4 is a transverse section on the line 4—4 of Fig. 2; and

Fig. 5 is a diagrammatic view illustrating the novel method.

In carrying out the novel method of handling ammunition in the form of cartridges, a plurality of cartridges *a*, for instance, from a conventional loading machine *b* are assembled in parallel alignment, and are removably fixed in this arrangement preferably upon the novel handling means *c* to be described hereinafter, and in any case so that the plurality of cartridges *a* may be readily manipulated as a unit. The removable fixing of the cartridges *a* upon the novel handling means preferably is effected at *d* by means of a novel

cartridge tape machine which forms the subject matter of a separate patent application.

The handling means *c* with the plurality of cartridges *a* temporarily fixed thereon is then conveyed and delivered to a gage and weigh machine *e* of customary form where the cartridges *a* are removed from the handling means *c* for gaging and weighing. The conveying of the handling means *c* with the cartridges *a* removably fixed thereon may be carried out by so-called tote-wagons *f* which may also be used for storing the loaded handling means *c*, as diagrammatically illustrated in Fig. 5.

After having been gaged and weighed, the cartridges *a* in parallel alignment are rolled over a pathway *g* which may comprise a suitable conveyor, for visual inspection to discover any defects which may exist in said cartridges *a*. At this point cartridges *a* may be periodically removed and placed, for instance, in a tray *h* having numbered pockets, for inspection by an official, such as a government inspector. As an example, every one hundredth cartridge *a* may be removed from the pathway *g* and placed in the tray *h*. Those cartridges *a* which traverse the pathway *g* are again removably fixed in parallel alignment on the handling means *c* at *d'*, for instance, by means of another of the novel cartridge tape machines previously referred to.

The handling means *c* with the cartridges *a* again removably fixed thereon may then be stored for instance in a tote-wagon *f'* similar to the tote-wagon *f*, to await the approval of the inspector of the sample cartridges *a* at *g*. Subsequent to such approval, the handling means *c* with the cartridges *a* removably fixed thereon is delivered, for instance, by means of the tote-wagon *f'* to the packing station *i* for packing in cases and then to the waxing unit *k* for ultimate delivery to the field arsenal. Or the cartridge loaded handling means *c* is conveyed, for instance, by means of the tote-wagon *f'*, directly to clip loading machines *l* or to a machine gun belt loader *m* for direct loading into gun clips or into machine gun belts respectively.

While the handling means *c* utilized in carrying out the novel method may be of any suitable type, it is preferred to employ the novel handling means illustrated in Figs. 1 to 4 inclusive, for this purpose.

The aforesaid novel handling means comprises a tape *10* preferably made of suitable paper such as for instance tough kraft paper, which is moisture resistant, although other types of material may conveniently be substituted if preferred.

The tape 10 may be of any desired or convenient length and width and in any case has its opposite longitudinal edges preferably reinforced, for instance, by being folded upon itself as indicated at 11 to provide longitudinal strengthening strips 12. The latter may be fastened in surface engagement with the tape 10 by pasting or otherwise, and in some instances may be simply folded over into unattached surface relation to said tape 10.

As an example, the tape 10 may be made of ninety pound paper and have an original width of two and one half inches, with the infolded edge strips 12 having a width for instance of approximately $\frac{3}{4}$ of an inch each. It will be understood that these dimensions are not arbitrarily required, and that they may vary in dependence upon the nature and calibre of the ammunition for which a given tape is designed.

The tape 10 is provided with two parallel spaced rows of slits 13 and 13^a extending longitudinally thereof in tandem relation with the slits 13 staggered relatively to the slits 13^a. Co-operating slits 14 are located in tandem arrangement lengthwise of the tape in symmetrically spaced registry with the slits 13 and corresponding slits 14^a are located in spaced symmetrical registry with the slits 13^a. As shown in Fig. 1, the slits 13 and 13^a are located along the central portion of the tape 10 while the slits 14 and 14^a are located in proximity to the inner edges of the respective infolded edge strips 12.

In practice cartridges 15 are inserted through the slits 13 and 14 of each registering pair of slits with the bullets of said cartridges pointing in one direction. Corresponding cartridges 15^a are inserted through the slits 13^a and 14^a of each given pair with the bullets of said cartridges pointing for instance in the opposite direction as shown in Fig. 2. To facilitate this operation of inserting the cartridges, the sections of the tape located between each pair of slits 13 and 14, and 13^a and 14^a may be forced in alternate opposite directions outwardly beyond the normal surface plane of the tape 10 to form loops for the reception of the cartridges 15 and 15^a as shown in Fig. 3. In any case, the tape 10 passes over and under the cartridges and securely holds them in position in predetermined parallel alignment and removably fixes said cartridges in this arrangement on the tape 10. This alignment is maintained throughout the handling of a given supply of cartridges from the stage at which the cartridges are loaded, to the point at which said cartridges are fed to belt or clip loaders whether at a manufacturing arsenal or at a distant point. The cartridges also remain in alignment for transport-packing or while stored and reduce the handling of said cartridges to the simplest operation.

Under existing conditions the cartridges are required to be unscrambled a number of times in the operation of handling said ammunition. For instance, every time a tote-wagon is used, the cartridges are in a jumbled mass and must be realigned for the next operation. Obviously a maximum of manpower is required in these tedious unscramblings of the tote-wagon contents. All of this manpower and all of the manual effort re-

quired in these operations is saved with the novel cartridge tape, which in addition avoids damaging of cartridges by avoiding the steps of carrying the cartridges in a jumbled mass in the tote-wagons at successive intervals.

With the novel handling means or cartridge tape unnecessary machinery is eliminated. For instance, a high speed fabric machine gun belt loader requires hoppers to deliver cartridges at uniform rate of speed and also needs sorting rolls to align said cartridges. When however the novel cartridge tape is used, a simple extractor is all that is required instead of the aforesaid mechanisms.

It will be noted that the tapes 10 with the cartridges 15 and 15^a in place thereon may be folded back and forth into the tote-wagons in an orderly arrangement, enabling said cartridge tape with the cartridges thereon to be easily withdrawn from the tote-wagons as this may be required.

The novel tape also facilitates the packing of the cartridges in containers for shipping purposes. In such case, for instance, cartridge tapes containing 338 cartridges may be packed two to the standard container in such a manner that the tapes serve as partitions between cartridges so that cartridge partitions now required are eliminated and the capacity of said standard container is thereby materially increased. Under existing practice such standard container might hold 480 rounds of ammunition, while the same container with the novel cartridge tape will accommodate 676 rounds of such ammunition.

The novel cartridge tape may be produced at low cost and without requiring any particular skill on the part of the operators either in producing the tape or in placing the cartridges in position thereon.

Various changes in the specific forms shown and described may be made within the scope of the claim without departing from the spirit of the invention.

We claim:

A handling means for cartridge ammunition comprising a single flexible tape provided with two spaced parallel inner rows of elongated slits transversely staggered in overlapping relation to each other, and of predetermined individual dimensions lengthwise of the tape, and two outer rows of elongated slits individually of lesser dimensions lengthwise of the tape, the shorter slits in the outer rows being in transverse centralized registry with the slits of the respective inner rows to provide cooperating pairs of transversely registering loops extending in spaced parallel rows lengthwise of the tape, the cooperating pairs of slits in the associated inner and outer rows being in staggered relation to the cooperating pairs of slits in the other associated inner and outer rows whereby the cooperating pairs of loops in the respective rows are correspondingly staggered relatively to each other, and cartridges extending transversely through the pairs of cooperating loops alternately in reversed position and removably fixed therein on said tape.

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