

986,753.

G. C. PLUMMER.
AMMUNITION CONVEYER.
APPLICATION FILED SEPT. 26, 1908.

Patented Mar. 14, 1911.
2 SHEETS—SHEET 1.

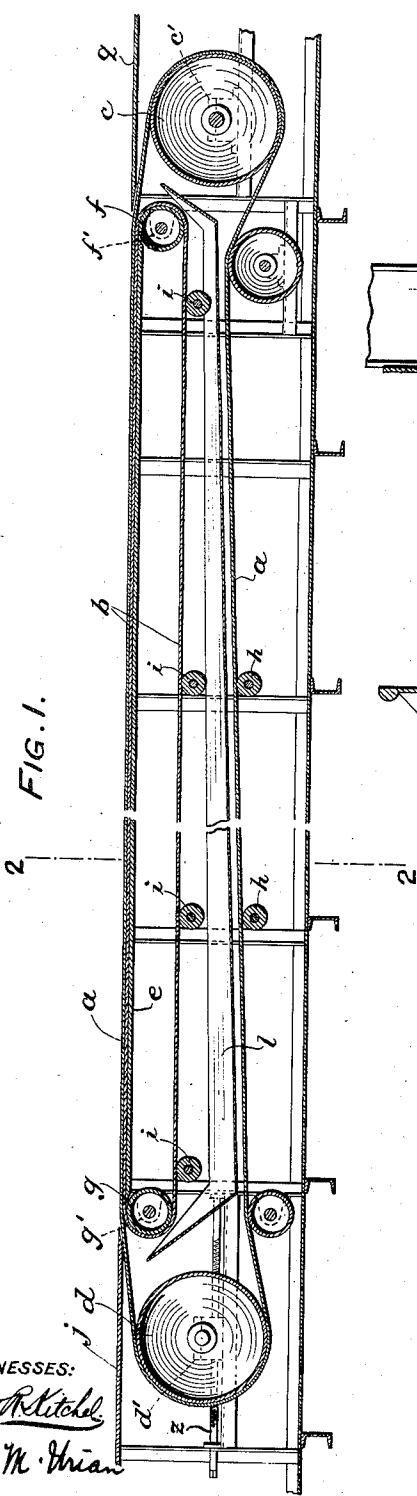


FIG. 1.

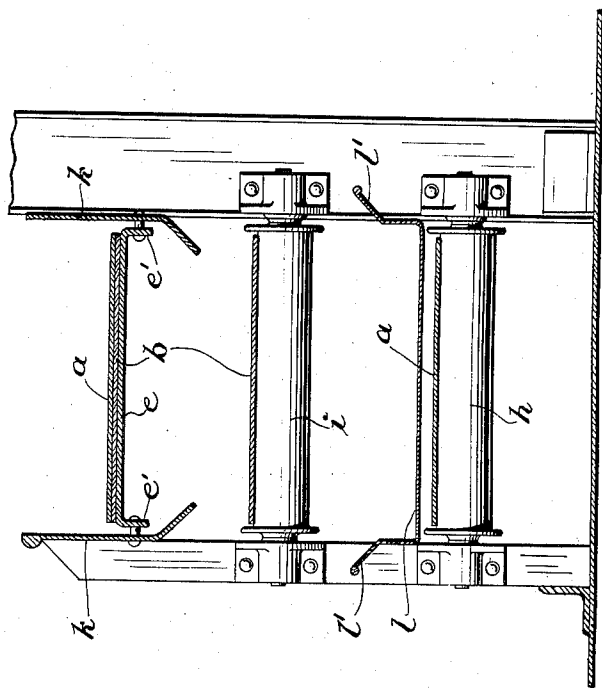


FIG. 2.

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2 SHEETS-SHEET 2.

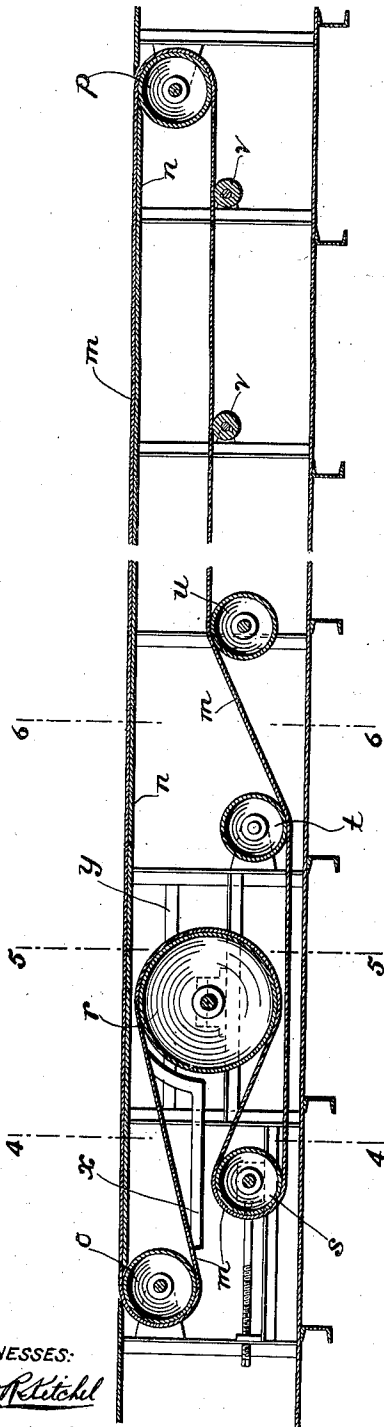


FIG. 3.

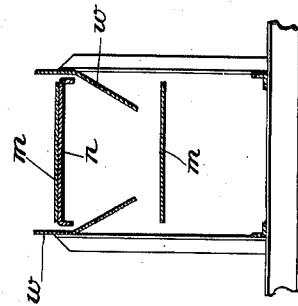


FIG. 6.

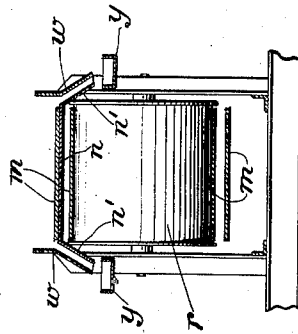


FIG. 5.

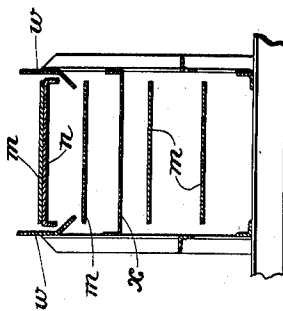


FIG. 4.

WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE C. PLUMMER, OF ARDMORE, PENNSYLVANIA, ASSIGNOR TO MAIN BELTING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

AMMUNITION-CONVEYER.

986,753.

Specification of Letters Patent. Patented Mar. 14, 1911.

Application filed September 26, 1908. Serial No. 454,930.

To all whom it may concern:

Be it known that I, GEORGE C. PLUMMER, a citizen of the United States, residing at Ardmore, county of Montgomery, and State of Pennsylvania, have invented a new and useful Improvement in Ammunition-Conveyers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

In war ships, for the purpose of transporting ammunition from the vicinity of magazines to the various guns, conveyers are used. At present these conveyers consist substantially of pairs of toothed wheels placed at the beginning and the ending of the space over which the ammunition is to be conveyed, of chains arranged to run, side by side, over these pairs of toothed wheels, and of plates of metal secured to the links of these chains. These plates, placed close together, forming between the pairs of toothed wheels a movable table. These conveyers, being of metal, are very heavy, so that when operated they consume a great deal of power. They are also very noisy, when running; so noisy, indeed, as to preclude the giving of verbal orders by officers to men while they are in operation. These defects and others make it desirable that some more easily operated and less noisy apparatus be provided.

Belt conveyers are practically noiseless and they, if properly designed and constructed, require much less power for their operation than do the above described conveyers. In handling ammunition, however, it is desirable that the carrying part of a conveyer shall be thoroughly supported at every point. Intermittent supports for a belt conveyer are usually provided by the use of rollers, over which the carrying part of the belt is arranged to be drawn. These rollers, however, allow a belt to sag, under heavy weights, between adjacent pairs, which is objectionable in ammunition conveyers. Continuous supports for such conveyers may be provided by placing underneath the carrying part of the belt a stationary table of wood or metal, but in dragging a belt over such a table much power is consumed in friction.

The specific object of my invention is to provide a conveyer of the belt type adapted for conveying ammunition which will not be open to the objections above enumerated.

To this end the invention consists in the combination with the traveling element of the conveyer and a table on which the carrying part of the same is adapted to slide, of means to allow the traveling element to slip freely over the table while maintaining a non-slipping connection with the driving element of the conveyer.

Specifically, the invention may be embodied in different specific forms, of which I prefer the form which consists of a traveling element consisting of a compound belt comprising a main belt and a supplemental belt underlying the main belt and driven thereby, and a table over which the compound belt slides and with which the supplemental belt alone contacts, and in which, preferably, the inner or sliding face of the compound belt and the working face of the table are lubricated by means of a lubricating substance applied to the inner face of the supplemental belt, or to the table, or to both. Another specific form, somewhat simpler in construction, but not open to use under all conditions, comprises a traveling element consisting of a single conveying belt and a table over which the belt slides, in which the inner or sliding face of the belt and the working face of the table are lubricated, combined with a driving element arranged to engage the unlubricated or working face of the belt instead of the non-working face of the belt as in an ordinary belt conveyer. Each of these specific embodiments of my invention is shown in the drawings and is hereinafter described, it being understood that both embodiments are illustrated merely and do not exhaust the possibilities in the way of variations, with respect to details of construction, of the essential features of the invention.

The invention also consists, secondarily, of devices to prevent the lubricant dropping upon the working or driving face or faces of the traveling element of the belt conveyer and to divert such escaping lubricant to the sliding face of the traveling element, and also to catch and retain lubricant escaping from the traveling element of the conveyer and to minimize the loss of the lubricant by waste.

In the drawings: Figure 1 is a longitudinal section, partly cut away, of a belt conveyer embodying my invention, with the guards or deflectors omitted. Fig. 2 is a

section on the line 2—2 of Fig. 1. Fig. 3 is a longitudinal section, partly cut away, of a modified belt conveyer embodying my invention, with the guards or deflectors omitted. Figs. 4, 5 and 6 are sections respectively on the lines 4—4, 5—5 and 6—6 of Fig. 3.

Referring first to the construction illustrated in Figs. 1 and 2: The traveling element of the belt-conveyer comprises the main belt *a* and the supplemental belt *b*. *c* and *d* are end pulleys around which the main belt *a* extends. The shafts of these pulleys are supported in bearings *c'* and *d'* respectively. One of the pulley shafts is a driving shaft. Upon the top of the belt *a* loads may be placed and carried between the loading and unloading tables *j* and *g*.

To substantially support the belt *a* under its load, I provide the table plate *e*, which may be rigidly constructed and held in place. To enable the belt *a* to slide over the table plate *e* I arrange pulleys *f* and *g* and the belt *b* around them, substantially as shown, the top of belt *b* being also supported on top of the table plate *e*, so that the top of belt *a* rests on the top of belt *b* and this, in turn, on plate *e*. The pulleys *f* and *g* are shown as supported respectively in bearings on the brackets *f'* and *g'*, secured to the table.

The belt *a*, when loaded and moved, will drag the supplemental belt *b* along with it. Belt *b*, therefore, is arranged to slide and supported *a* to move over its course thoroughly supported and without sliding or sagging. To enable the supplemental belt *b* to slide readily, I make its face slippery, which may be done by the application of lubricating oils, greases, graphites, etc.; or the lubricating substance may be applied to the face of the table. The adhesion of belt *a* to belt *b* may be increased to a material extent, if desired, by the application of suitable adhesive substances to one of the opposing faces of the two belts, preferably to the belt *a*.

h, *h*, are rollers spaced apart and underlying the lower reach of the main belt *a*, whereby this part of the belt is intermittently supported and held from substantial sagging. Similar rollers *i*, *i*, underlie the lower reach of the supplemental belt *b*. One of the pulleys *c*, *d*, preferably the one not directly driven, may be made adjustable so as to take up the slack in the main belt. For this purpose I have shown the adjusting screws *z* engaging bearings *d'*.

Secured to flanges *e'* at the sides of the table are guards or deflectors *k*. These guards are spaced from the table and extend from substantially above the level of the table to substantially below the level of the table. The lower ends of the guards are bent obliquely inwardly. The function of

these guards is to catch any particles of the lubricating material that escape from the table and divert them onto the inner face of the lower reach of the supplemental belt.

Between the lower reach of the supplemental belt *b* and the lower reach of the main belt *a* is a pan *l*, the ends of which extend respectively up between the pulleys *c* and *f* and pulleys *d* and *g*. The function of this pan is to catch and retain any particles of lubricating material that may drop off the lower reach of the supplemental belt. To the flanged sides of the pan *l* are secured the obliquely outwardly extending guards *l'*, upon which fall any particles of lubricating material that may fall off the edges of the supplemental belt. By this construction the deposit of lubricating material on the main belt *a* or on any other part of the structure except the sliding or lubricated surface of the supplemental belt *b* is prevented, while any lubricating material that escapes from the latter belt is caught and may be collected and used over again.

In the modification shown in Figs. 3, 4, 5 and 6, the traveling element of the conveyer consists of the single belt *m*. This belt slides directly upon the table plate *n* and the sliding face of the belt and the surface of the table are lubricated, preferably by applying a lubricant to the table. *o* and *p* are end pulleys around which the belt *m* extends. *r* is the driving pulley, which is located preferably underneath the table and is arranged to engage the carrying face of the belt contrary to the usual arrangement in which the driving pulley engages the non-working face of the belt. The belt preferably passes direct from one of the end pulleys *o* to and around the driving pulley *r*, thence to and around the pulley *s* (which may be adjustable horizontally to tighten the belt), thence under the pulley *t* and over the pulley *u* and thence over the rollers *v* to the other end pulley *p*. By this arrangement the belt *m* will move over the table plate *n* without undue friction, and at the same time the driving pulley will not contact with the lubricated face of the belt, whereas if either of the end pulleys were employed as a driving pulley, the adhesion of the belt to the driving pulley would be so reduced by the lubricant adhering to the non-working face of the belt that under a load the slippage between the belt and driving pulley would be so great that its operation would be more or less uncertain and irregular, while under a heavy load there would be danger of complete inoperativeness.

As in the preferred construction, guards *w* are provided at the sides of the table to catch escaping particles of lubricant and guide them onto the inner face of the lower reach of the belt, and beneath the lower

reach of the belt above the adjustable pulley s is a pan x to catch particles of lubricant escaping therefrom. It is desirable, however, to guard against any particles of lubricant being deposited upon that part of the belt which, at any given time, is passing over the driving pulley r , in order to certainly protect the driving pulley. This is accomplished by bending the lower ends of the guards w obliquely outwardly, instead of obliquely inwardly, at this point, and also by bending the flanged edges n' of the table plate n in the same direction, and by providing pans y at opposite sides of the driving pulley to catch any lubricant that may escape between the guards w and flanges n' .

While the conveyers hereinbefore described are more especially designed with a view of handling ammunition on war vessels, the utility of the invention is not limited to this application, as it may be found available for use in conveying other materials in other situations.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:—

1. In a belt conveyer, the combination with the traveling element thereof, of a substantially continuous rigid support over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, and driving means engaging the part of the traveling element not contacting with the said surface of the table.

2. In a belt conveyer, the combination with the traveling element thereof, of a table over and along which from end to end the traveling element is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, and driving means engaging the part only of the traveling element not contacting with the said face of the table.

3. In a belt conveyer, the combination with the main or conveyer belt, and driving means therefor, of a supplementary belt underlying and contacting with the main belt, and a substantially continuous rigid support underlying and contacting with the supplementary belt and over which the latter is adapted to slide substantially throughout the length of the support and be driven by frictional contact with the main belt.

4. In a belt conveyer, the combination with the main or conveyer belt and driving means therefor, of a supplementary belt under the main belt, and a substantially continuous rigid support over which the supplementary belt is adapted to slide and be driven by frictional contact with the superposed main belt, the surface of the table or of the opposing face of the supplementary belt being lubricated.

5. In a belt conveyer, the combination with the traveling element thereof comprising an endless main belt and an endless supplementary belt, the latter underlying the former in their upper reaches, of a table over and along which from end to end the traveling element is adapted to slide, the surface of the table or of the opposing face of the supplemental belt being lubricated, and means to drive the main belt.

6. In a belt conveyer, the combination with a table, of an endless belt whose upper reach overlies the table substantially throughout the latter's length, idler pulleys about which the endless belt is adapted to travel, an endless conveyer belt whose upper reach overlies the upper reach of the first belt, and other pulleys, one of which is a driving pulley, about which the conveyer belt is adapted to travel, whereby the conveyer belt drives the other belt by frictional contact therewith, while sliding over the table.

7. In a belt conveyer, the combination with the traveling element composed of two flat faced belts of substantially equal width, of a table over which said belts are adapted to slide, the surface of the table, or of the opposing face of the belt contacting therewith being lubricated throughout the width of the traveling element, and means to drive the main belt.

8. In a belt conveyer, the combination with the traveling element thereof, of a table over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, and means to divert lubricant escaping from the table onto the sliding face of the traveling element temporarily out of sliding engagement with the table.

9. In a belt conveyer, the combination with the traveling element thereof, of a table over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, and guards at the sides of the table extending from above the same to below the same and above the sliding face of the traveling element temporarily out of sliding engagement with the table.

10. In a belt conveyer, the combination with the traveling element thereof, of a table over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, and guards at the sides of the table and spaced therefrom and extending above and below the same, whose lower ends extend obliquely inwardly and overhang the sliding face of the traveling element temporarily out of sliding engagement with the table.

11. In a belt conveyer, the combination with the traveling element thereof, of a

- table over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, means to divert lubricant escaping from the table onto the sliding face of the traveling element temporarily out of engagement with the table, and means to catch lubricant escaping from the last-named part of the traveling element.
12. In a belt conveyer, the combination with the traveling element thereof, of a table over which the same is adapted to slide, the surface of the table or of the opposing face of the traveling element being lubricated, guards at the sides of the table extending from above the same to below the same and above the sliding face of the traveling element temporarily out of sliding engagement with the table, and a receptacle underneath the last-named part of the traveling element to catch and retain lubricant escaping therefrom.
13. In a belt conveyer, the combination with the traveling element thereof comprising a main belt and a supplementary belt adapted to be driven thereby, of a table over which the supplementary belt is adapted to slide, and means to divert lubricant escaping from the table onto the inner or upper face of the lower reach of the supplementary belt.
14. In a belt conveyer, the combination with the traveling element thereof comprising a main belt and a supplementary belt adapted to be driven thereby, of a table

over which the supplementary belt is adapted to slide, and guards at the side of the table and spaced therefrom whose lower ends overhang the inner or upper face of the lower reach of the supplementary belt.

15. In a belt conveyer, the combination with the traveling element thereof comprising a main belt and a supplementary belt adapted to be driven thereby, of a table over which the supplementary belt is adapted to slide, means to divert lubricant escaping from the table onto the inner or upper face of the lower reach of the supplementary belt, and means to catch lubricant escaping from the lower reach of the supplementary belt.

16. In a belt conveyer, the combination with the traveling element thereof comprising a main belt and a supplementary belt adapted to be driven thereby, of a table over which the supplementary belt is adapted to slide, guards at the side of the table and spaced therefrom whose lower ends overhang the inner or upper face of the lower reach of the supplementary belt, and a receptacle underlying the lower reach of the supplementary belt and overlying the lower reach of the main belt.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, Penna., on this 24th day of September, 1908.

GEORGE C. PLUMMER.

Witnesses:

FRANK S. BUSSEY,
M. M. HAMILTON.