

(No Model.)

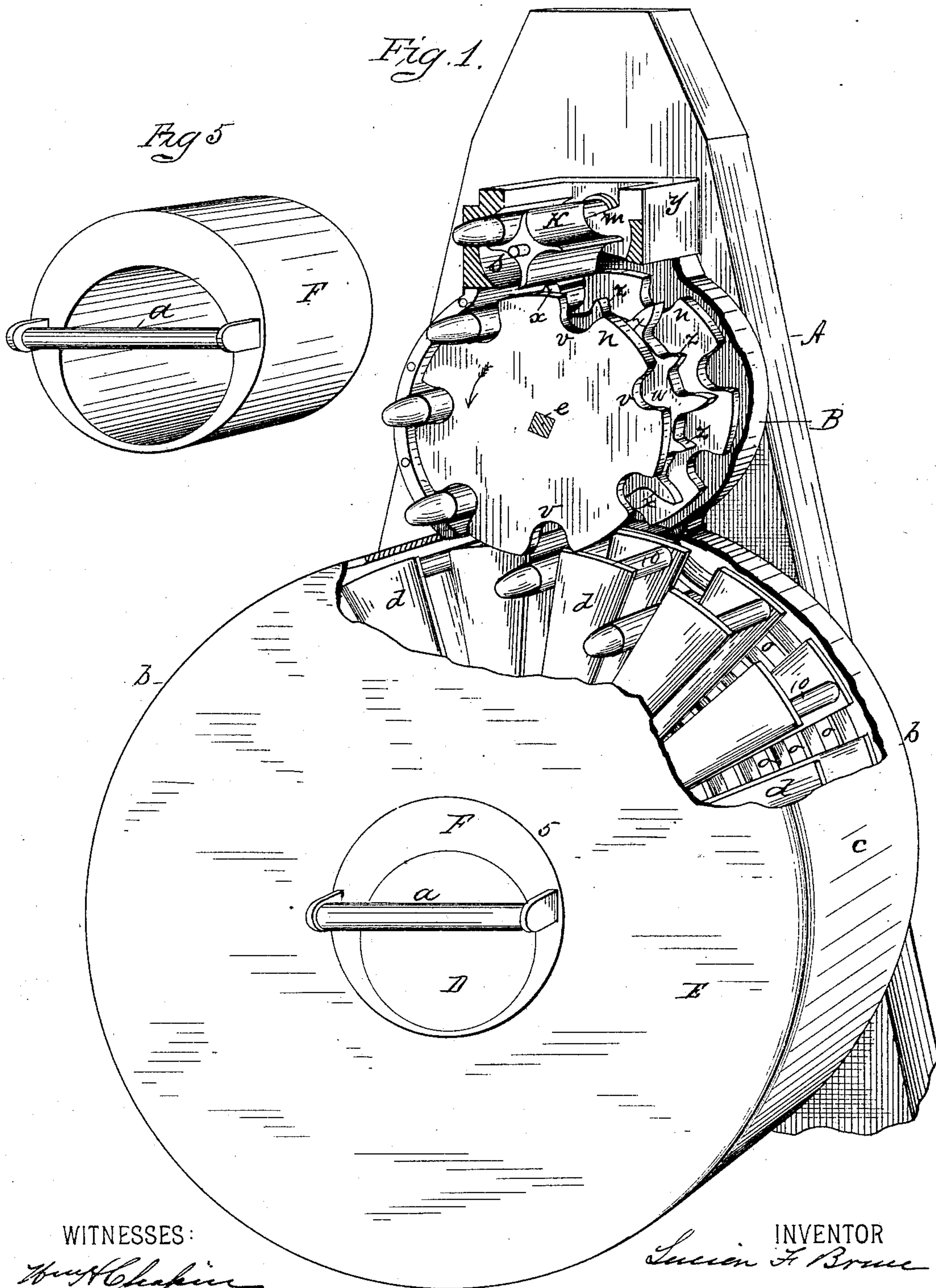
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L. F. BRUCE.

CARTRIDGE CHARGER FOR MACHINE GUN FEEDERS.

No. 341,371.

Patented May 4, 1886.



WITNESSES:

Henry A. Chapin
W. F. Rice

INVENTOR

Lucien F. Bruce

BY

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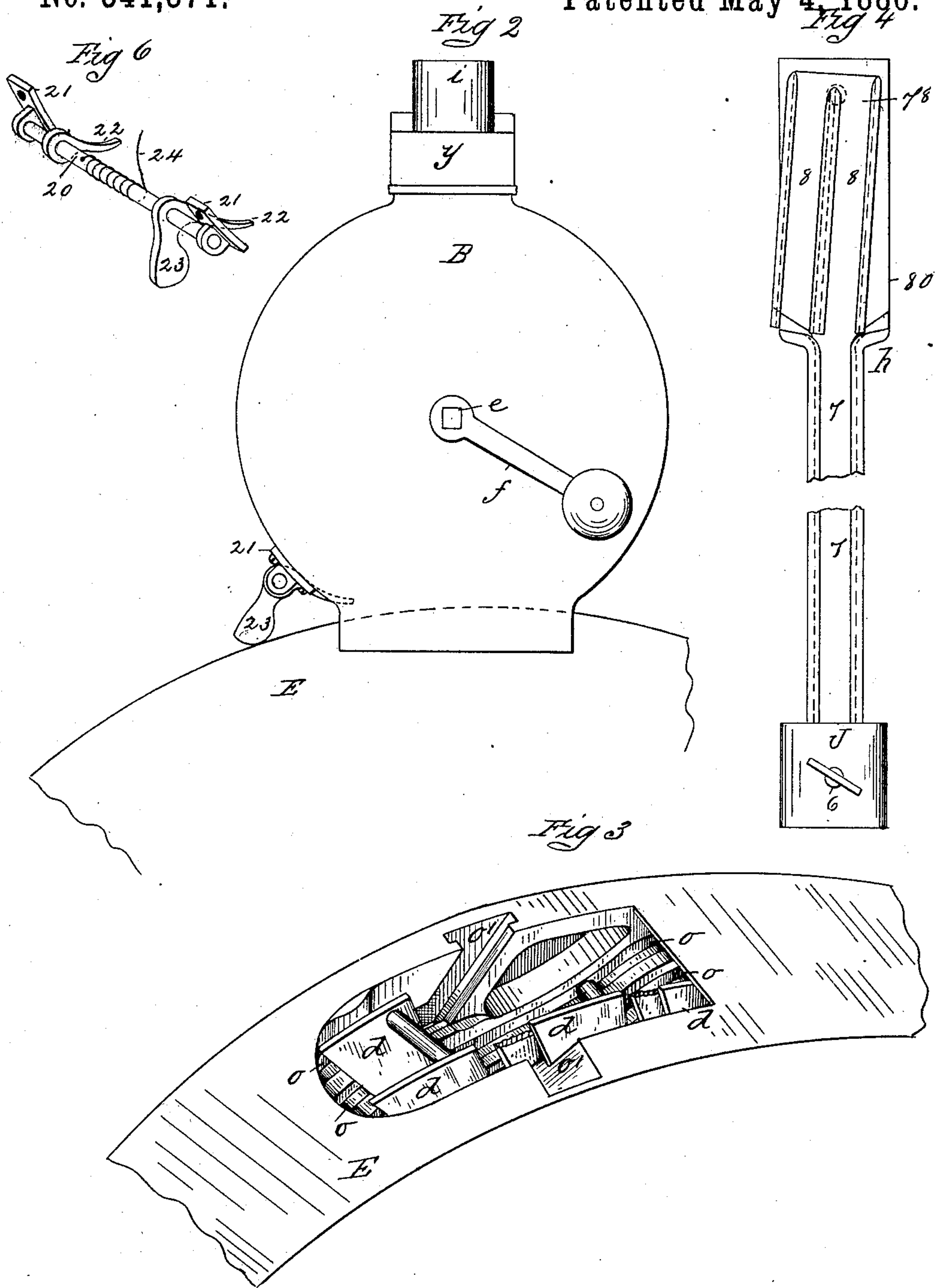
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UNITED STATES PATENT OFFICE.

LUCIEN F. BRUCE, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE
GATLING GUN COMPANY, OF HARTFORD, CONNECTICUT.

CARTRIDGE-CHARGER FOR MACHINE-GUN FEEDERS.

SPECIFICATION forming part of Letters Patent No. 341,371, dated May 4, 1886.

Application filed September 7, 1885. Serial No. 176,310. (No model.)

To all whom it may concern:

Be it known that I, LUCIEN F. BRUCE, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Cartridge-Chargers for Machine-Gun Feeders, of which the following is a specification.

This invention relates to improvements in cartridge-chargers for machine-gun feeders, the object being to provide improved devices for placing cartridges one by one in magazine-feeders for machine-guns of the Gatling-gun class, from which they are delivered to the gun to be fired.

In the drawings forming part of this specification, Figure 1 is a perspective view, partly in section, and showing a portion of the outer cases broken away, of a gun-feeder and a cartridge-charger therefor, the latter being constructed according to my invention, said figure showing the charger and the feeder in operative positions and a number of cartridges in the positions they occupy in being conveyed into the feeder, as hereinafter set forth. Fig. 2 is a front elevation of the cartridge-charger, and shows also a portion of the side of the said feeder. Fig. 3 is a perspective view of that portion of the periphery of the gun-feeder in which is the opening through which cartridges are introduced, but showing the cartridge-guiding grooves in its side walls inclining in the opposite direction to those shown in Fig. 1. Fig. 4 is a front view of a cartridge-guiding device employed in removing cartridges from the usual packing-boxes and conducting them into the cartridge-charger. Fig. 5 is a perspective view of an eccentric bushing which is employed in the manipulation of the feeder while the latter is being charged, as hereinafter described. Fig. 6 is a perspective view of the cartridge stop devices which are applied to the charger.

In the drawings, A indicates a suitable upright frame, to the side of which the cartridge-charger B is secured, and having thereon a cylindrical stud, D, on which the gun-feeder E is hung and supported while it is receiving the cartridges from the charger in the posi-

tion shown in Fig. 1. It will be observed that the stud D is of smaller diameter than a central transverse hole through the feeder E, the end of which is indicated by the circular line 5, Fig. 1. The hollow bushing F, provided with the handle *a*, fits the said hole in the feeder within line 5, and also the stud D, on which it freely turns. The said eccentric bushing F is used in conjunction with the feeder E and the stud D for the purpose of elevating the feeder to its proper place beneath the charger when about to be filled with cartridges, as in Fig. 1, and for lowering it away from the charger when filled, both of which operations are effected by turning said bushing on stud D, the feeder ordinarily being first placed on the stud and the bushing then placed on the latter with its thick side down, after which, by turning the bushing by its handle *a*, the feeder is elevated to the position shown and brought into connection with the charger, as hereinafter described.

After the feeder E is filled with cartridges, turning thick side of bushing F downward causes it to drop away from the charger, and it is then removed from stud D for use on a gun.

The feeder E is a well-known device for holding a quantity of cartridges and delivering them to a machine-gun, actuated by a moving part of the latter after having been applied thereto. Said feeder consists of two disk-shaped metallic side plates, *b b*, each secured on a tubular center, heretofore referred to as receiving the bushing F, a band, *c*, through which is an opening, as shown in Fig. 3, being secured around the border of said plates, thereby forming a short cylindrical box. Said plates *b b* have on their inner opposite sides a series of spiral grooves, *o*, extending from the periphery thereof nearly to said tubular center, the said grooves having an inclined cartridge-entrance, *o'*, at the opening on the border of the feeder, as shown in Fig. 3. Said spiral grooves on the plates *b b* are formed by securing suitable metallic strips thereto by their edges, or in any other suitable manner, the width of said grooves being sufficient to allow the head and the ball end of

a cartridge (when held in the position shown in Fig. 1) to move freely therein, following said grooves inwardly and outwardly. Motion is given to said cartridges, whereby they are caused to follow the grooves *o* in the feeder, as aforesaid, by a wheel having arms *d*, arranged in pairs and secured to a suitable hub on said tubular center in the feeder. Said arms radiate from said hub between the plates *b b*, as shown, and each pair is sufficiently separated from the other to allow a cartridge to pass therebetween, as shown in Fig. 1. It is seen, therefore, that a cartridge dropped into the inclined entrance *o'* to the grooves *o* in the sides of the feeder *E* and falling between the pairs of the arms *d* is, by the rotary motion of said arms, forced to follow the spiral grooves to their termination near the center of the feeder, and by reversing the motion of said arms the cartridge is forced out of the feeder. Heretofore said feeder has been charged by picking up one cartridge at a time, dropping it into the feeder, and turning said arms sufficiently to carry said cartridge away from the entrance *o'*, and repeating said operation until the feeder was filled. Said means of charging the feeder are inadequate to the requirements of a machine-gun, which uses the contents of said feeder in much less time than is required to fill it; and to obviate said inconvenience and to provide means for charging said feeder rapidly and accurately the within-described improvements are provided.

The cartridge-charger by which cartridges are carried one by one into the feeder *E*, and by which the aforesaid armed wheel in the latter is rotated to cause the said cartridges to take their proper places in the feeder, is constructed as follows: Within a suitable cylindrical metallic case is mounted in proper bearings the shaft *e*, which is rotated by the crank *f*. On said shaft *e* are fixed two separated circular metallic plates, *n n*, having the notches or recesses *v* in their borders in coinciding positions. Said plates are sufficiently separated to allow the ends of the arms *d* of the feeder to pass up between them, as shown. Between the plates *n n* on shaft *e* is fixed the disk *w*, having projecting from its periphery the long and short teeth, respectively, *x* and *z*, the said parts *n n*, fixed on the shaft *e*, constituting the charger-wheel. Above the said charger-wheel, and suitably secured to said case, is a wheel-case, *y*, of oblong form, having an opening through it, which constitutes the mouth of the charger, and in which is hung the winged cartridge-governing wheel *k*, which rotates therein at a suitable distance from the curved inner wall, *s*, to permit a cartridge to pass between the latter and the wheel in the position shown in Fig. 1. The inner wall of the wheel-case *y*, opposite the wall *s*, is recessed, and at each end of the recess is formed an inclined table, *m*, and said wheel rotates between said inclined parts of the wheel-case, projecting a little beyond the edges of said parts. The upper side

of the wheel-case *y* is provided with an up-standing lip, *i*, (see Fig. 2,) and is otherwise properly formed to receive the foot *J* of the cartridge guide or feeder *h*, Fig. 4, the latter being secured to the lip *i* of the wheel-case by the thumb-screw *6*. To provide means for preventing the rotation of the said cartridge-carrying wheel of the charger by the weight of the cartridges in the latter when the filled feeder *E* is removed from under the charger, and for allowing the cartridges to resume their movement toward the feeder when another is placed under the charger, the stop devices illustrated in Figs. 2 and 6 are applied to the latter, and are constructed and operate as follows: A shaft, 20, is hung in suitable bearings, 21, on the side of the charger-case near its lower end. Two arms, 22, are fixed on said shaft, which project therefrom through said case, as shown in dotted lines in Fig. 2, and on one of said arms, or attached to the shaft, as may be preferred, is an outwardly-reaching arm, 23. A coiled spring is attached to shaft 20, and its free end is adapted to bear against the side of the charger-case to rock said shaft in one direction. Thus when the feeder *E* is applied under the charger to be filled, the border of its case strikes the end of arm 23, as in Fig. 2, swinging it upward, rocking shaft 20, and throwing the ends of the arms 22, which reach under the lower cartridge in the charger-wheel, downward and letting the latter revolve and drop the cartridges into the feeder; but when the latter becomes full and is removed from under arm 23, spring 24 rocks shaft 20, thereby throwing the arms 22 upward again under the lower cartridge in the charger and stopping the flow of cartridges therefrom. The said cartridge-guide consists of the single-grooved conductor 7, connecting with the foot *J*, and having therein the usual grooves, in which the flanges of the heads of the cartridges engage as they slide down, as herein-after described. The upper end of the conductor 7 is provided with an enlarged portion or plate, 80, on which is pivoted the double-grooved conductor 78, having two grooves, 8, of like form to that in said conductor 7, whose lower ends, one after the other, are capable of being swung over the upper end of the groove in conductor 7.

The conductor 78 is adapted to receive at once a certain number of cartridges from a box, in which they are packed with their heads or flanges outward, by engaging the latter with the grooves 8 in said conductor, and then drawing the box away from the cartridges, leaving the latter hanging on the conductor, and such as are in one of the grooves 8, which communicates with the groove 7 below, will at once drop into the latter, and from thence they will move into the said mouth of the charger *B*, and immediately that the groove in conductor 78 which is in line with conductor 7 is emptied the weight of the cartridges in the second groove of the upper conductor will cause the latter to swing and bring the car-

tridges in the said second groove over the end of conductor 7, letting them drop into the latter, and so as often as the two grooves of the conductor 78 are supplied with cartridges 5 each groove will be emptied into conductor 7, one after the other, as above described.

The above-described cartridge-conductor is only one of several devices which may be employed to present the cartridges one by one to the mouth of the charger B, the latter being adapted to operate in connection with any conductor which is capable of presenting the cartridges to the mouth of the charger so that they will fall lengthwise on the wheel K.

15 The operation of the within-described improvements is as follows: Cartridges being delivered to the mouth of the charger B, as above set forth, fall first onto the inclined part *m* at each end of the wheel K, and thence they roll 20 or slide against the latter, which turns and allows the cartridge to pass between the wall *s* and the wheel, the latter meanwhile holding the cartridge in a horizontal position and preventing its ball end from dropping first. The 25 shaft *e* is turned by the crank *f* rotating the aforesaid charger-wheel. If the border of the plates *n* between the notches *v* be passing under the cartridge, the latter will be held up on said border until the notches or recesses 30 *v* pass under it, (the charger-wheel rotating in the direction indicated by the arrow,) when the cartridge will drop into one of said recesses and be carried around within the case of the charger toward the feeder E, and having 35 arrived over the inclined entrance *o'* to the spiral grooves in the feeder it will drop into the latter between the arms *d*. Meanwhile the teeth *x* of the disk *w* engage with the cross-bars 10, between the arms *d*, and cause 40 the wheel within the feeder E to rotate continuously with the action of wheel *w*, thereby producing a constant movement of cartridges through the charger B into the feeder E, and causing the latter's arms *d* to be rotated 45 and carry said cartridges into said grooves in the feeder, as above described.

The short teeth *z* on the toothed disk *w*, between the long teeth *x*, are provided to prevent the wheel in the feeder, when overloaded on one side, from turning out of place 50 relative to the charger-wheel, for the bars 10, between the arms *d* of the feeder-wheel, will strike said short teeth when said disk is inclined so as to turn or run ahead by overloading, as aforesaid. Said short teeth also aid in 55 causing the charger-wheel and the feeder-wheel to come to proper relative positions when brought together, by preventing undue movement of the former before it commences 60 to drop cartridges into the feeder, said short

teeth coming in contact with bars 10 and effecting said result.

If desired, the conductor *h*, or other device having the same function, may be dispensed with, and the cartridges be dropped one by 65 one into the mouth of the charger while the operator turns crank *f* with the other hand, and in this way the feeder E may be filled with cartridges much more rapidly than by the aforesaid means heretofore employed. 70

What I claim as my invention is—

1. The within-described cartridge-charging devices for machine-gun feeders, consisting of a rotating wheel, substantially as described, inclosed in a suitable cylindrical case, and having 75 recesses in its periphery for the reception of cartridges, combined with the winged wheel K, the wheel-case *y*, having the inclined table *m* at the end of said wheel K, and a suitable cartridge-conductor for delivering cartridges 80 to the said charging devices through the mouth thereof, substantially as set forth.

2. The cartridge-charger consisting of a rotating charger-wheel, substantially as described, inclosed in a suitable cylindrical case, 85 and having recesses in its periphery for the reception of cartridges, a toothed disk attached to said wheel, the wheel-case *y*, attached to said cylindrical case above the charger-wheel and having the inclined table *m*, and the winged 90 wheel K, hung in said case *y*, combined with the feeder E, provided with the internal wheel engaging with said toothed disk, substantially as set forth.

3. In combination, the feeder E, the charger-wheel and its inclosing-case, the rock-shaft 20, 95 supported on the latter, the arms 22 and 23, fixed on said shaft, the former reaching into said case, and the spring 24, substantially as set forth. 100

4. A cartridge-charger for machine-gun feeders, consisting of a rotating wheel, substantially as described, inclosed in a suitable cylindrical case, and having recesses in its periphery for the reception of cartridges, 105 combined with the winged wheel K and the wheel-case *y*, having the inclined table *m* at the end of said wheel K, substantially as set forth.

5. In combination, the frame A, having the 110 stud D thereon, the charger B, the feeder E, supported on said stud, the eccentric bushing D, interposed between the latter and the feeder, and capable of being rotated on the stud, thereby moving the feeder toward and from the 115 charger, substantially as set forth.

LUCIEN F. BRUCE.

Witnesses:

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WM. H. CHAPIN.