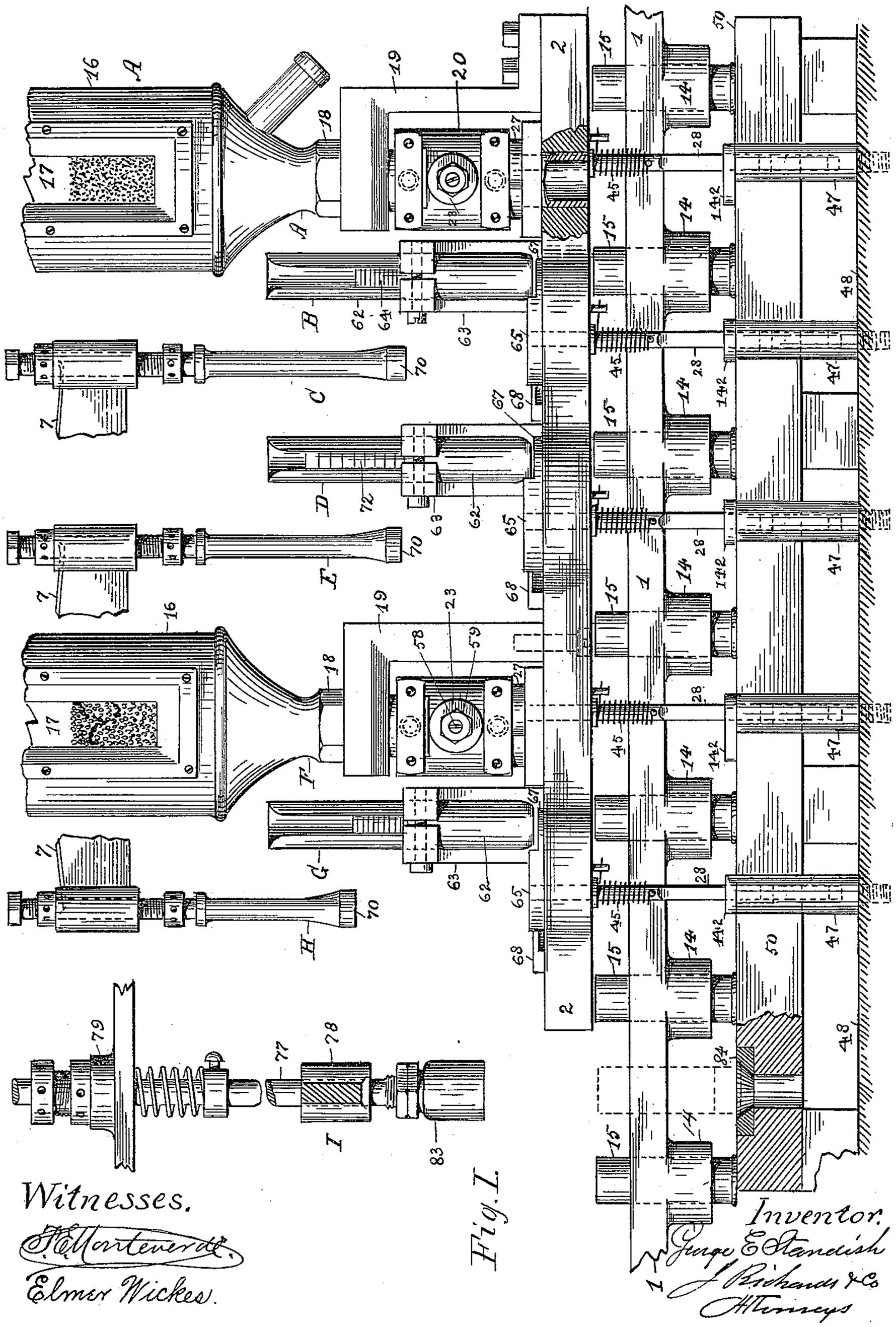
No. 640,496. Patented Jan. 2, 1900.

G. E. STANDISH.

CARTRIDGE LOADING APPARATUS.

(Application filed June 15, 1899.)

(No Model.) 3 Sheets—Sheet 1.



Witnesses.
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Fig. 1.

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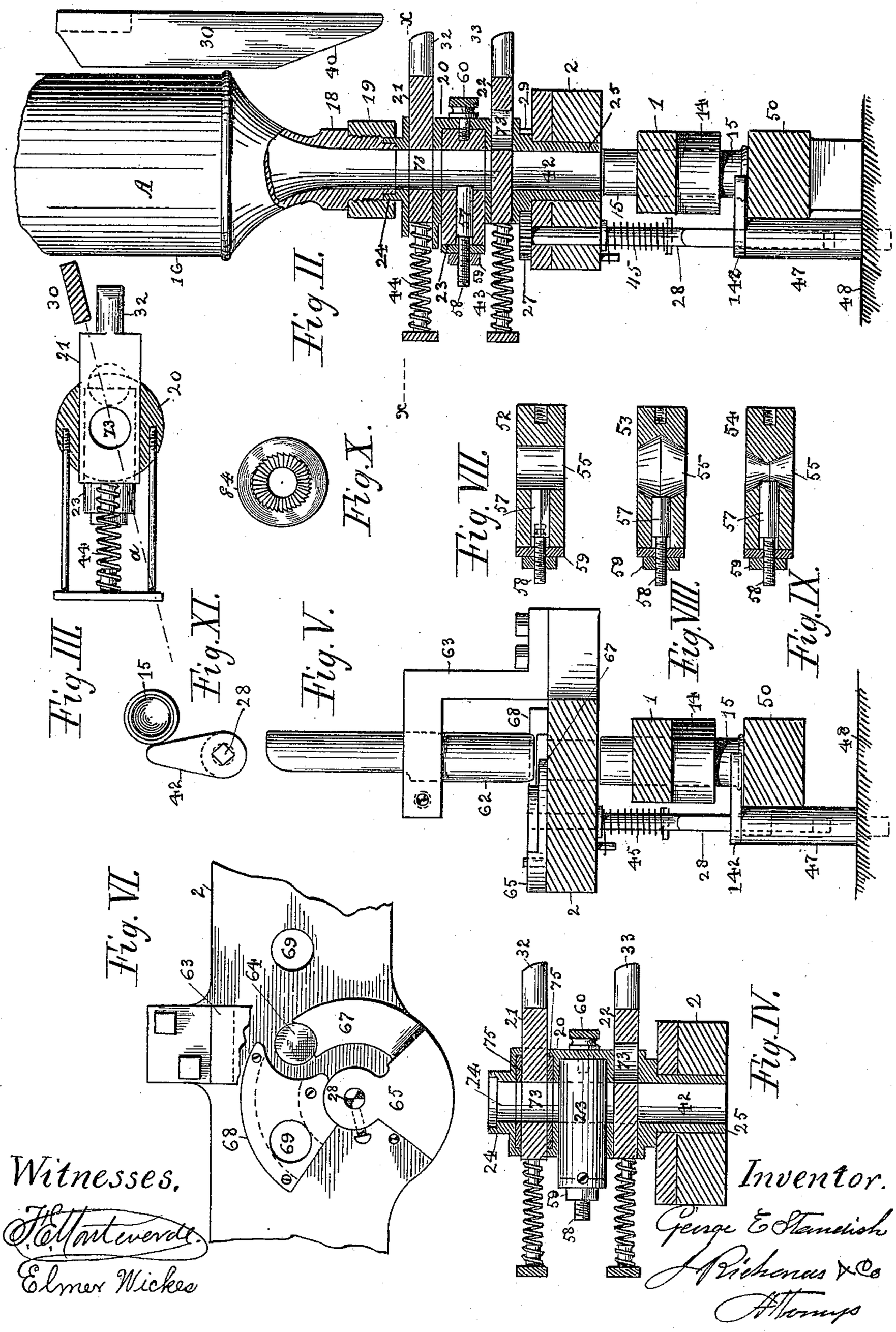

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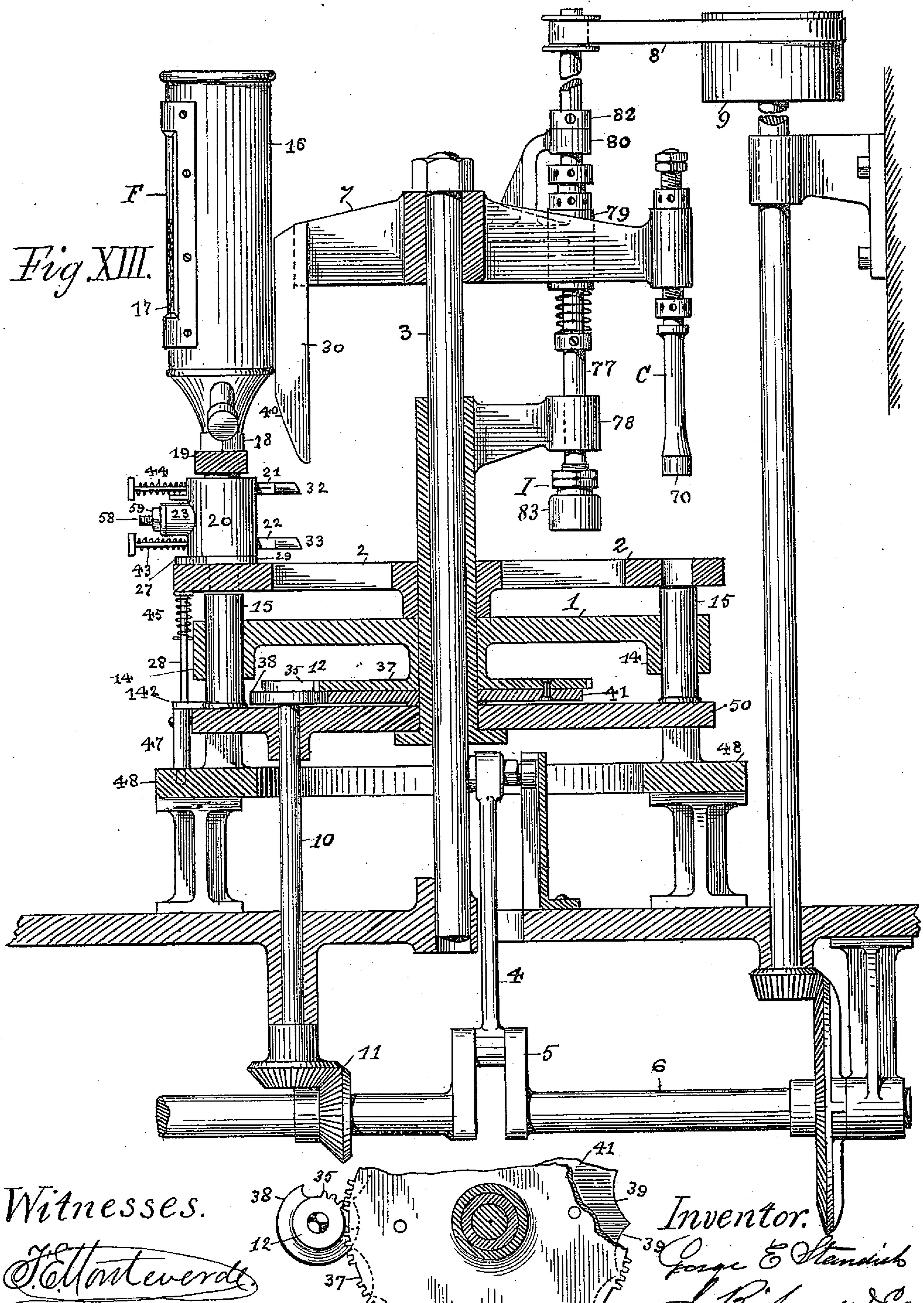
(No Model.) 3 Sheets—Sheet 3.

Fig. XIII.



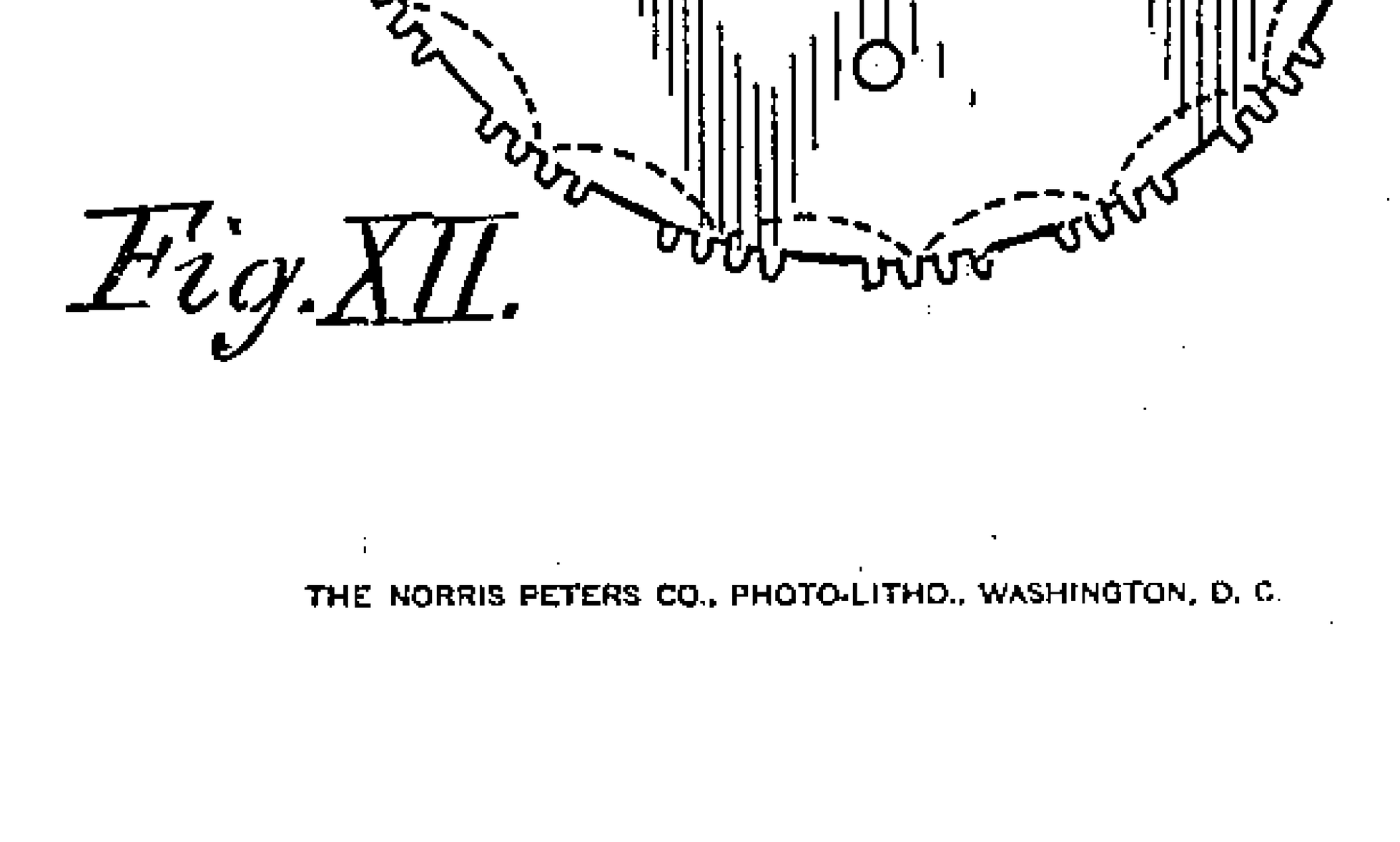


Fig. XII.

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UNITED STATES PATENT OFFICE.

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CARTRIDGE-LOADING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 640,496, dated January 2, 1900.

Application filed June 15, 1899. Serial No. 720,726. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. STANDISH, a citizen of the United States, residing at Selby, county of Contra Costa, and State of California, have invented certain new and useful Improvements in Cartridge-Loading Apparatus; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to devices and apparatus for filling or charging gun-cartridges, especially for shotguns, and to certain useful improvements therein.

My improvements consist in devices whereby the various motions are accurately registered and timed to prevent false or interfering action between the consecutively-acting parts of a machine; in devices whereby the charges of powder, especially of the nitrogenous class, are carefully and accurately determined; in an improved apparatus for measuring and discharging charges of both powder and shot; in devices to hold the cartridges while being crimped at the ends; devices for selecting and placing the wads concentric with the cartridge-shells, and in various other features of a constructive and operative nature that will be hereinafter fully pointed out and explained in connection with the drawings forming a part of this specification.

The objects of my invention are to attain accuracy of the charges, especially of nitro-powders, by adjustments that will insure against irregular loading and accidents, to promote the celerity of the work, and to provide devices that are certain in their action, durable, and simple in their manner of operating.

To these ends I construct apparatus as shown in the drawings herewith, forming a part of this specification.

Figure I is a development in a horizontal line of the several devices for filling or charging cartridges shown in relation to the consecutive operation of these devices. Fig. II is an elevation, mainly in section, of the measuring devices for charges of powder. Fig. III is a section through Fig. II on the line *x x*. Fig. IV is a vertical section through the device for measuring charges of shot. Fig. V is a side elevation of the devices for supplying and placing the wads. Fig. VI is a plan view of Fig. V with some of the parts omitted. Figs. VII, VIII, and IX are sections through chargers for powder. Fig. X is a plan view of a die in which the base of the cartridges are held while the ends are being crimped. Fig. XI is a plan view of one of the tripping-pawls that set, actuate, or adjust the various devices for charging the cartridges. Fig. XII is a detail in plan, showing a manner of operating the revoluble member in which the cartridge-shells are held. Fig. XIII is a diagrammatic drawing indicating a manner of mounting and operating the devices illustrated in the preceding figures.

Like letters and numerals of reference are applied to corresponding parts throughout the various figures of the drawings.

Referring first to Fig. XIII, the main elements or parts of the organized machine of the usual type for charging cartridges consist of a moving member 1, in which the cartridge-shells are held and presented successively to the action of the devices to which my improvements relate.

2 is a fixed member on which are mounted the charge-measuring devices for powder and shot, also the wad-magazines and other stationary parts.

3 is a vertically-reciprocating stem actuated by a link 4, connecting to a crank 5 in the shaft 6, and is provided at the top with a cross head or frame 7, to which are attached the several devices that have reciprocating movement.

The crimping-spindle I is driven by a band 8 from a pulley 9, with connections to the shaft 6, as shown, or in any other suitable manner, preferably from an independent horizontal shaft when there are a number of machines set in a row.

The member or carriage 1 is driven by a vertical spindle 10 from the shaft 6 by means of the bevel-wheels 11 and the intermittently-acting pinion 12, (shown in plan in Fig. XII,) that produces movements and periods of pause corresponding to the pitch or distance between the cartridge-shells 15 in the movable member 1 and to holes in the fixed member 2, through which the charges pass. The

pinion 12 is provided with a toothed sector 35, that engages the segmental wheel 37, moves that, and at the same time the member 1, for a distance equal to the pitch between the cartridge-shells 15 or the distance between the elements marked from A to I in Fig. I. Then the plain sector 38 passes into the curved seats 39 in lower plate 41 of the wheel 37, holding these, and consequently the movable member 1, positively during the operations of charging with powder, wads, and shot, also crimping.

In Fig. XIII, which is only to illustrate the principal motions of the parts, I show the shot-charging devices F, one of the rammers for wads C, and the crimping devices I, all of which will be further explained in connection with the other figures of the drawings.

Referring now especially to Fig. I of the drawings, this illustrates the development in elevation of the various charging devices in one plane or in a straight line, so as to be more plainly described, the different elements of the machine being marked by letters from A to I on the drawings in the order of their occurrence in operating. The movable member 1 and fixed member 2 correspond to 1 and 2 in Fig. XIII, the former having a series of equidistant sockets 14, in which the cartridge-shells 15 fit loosely and by means of which they are moved in line with the various operating parts A to I, mounted on the members 2 and 7.

Referring first to the the element A for measuring and supplying charges of powder, (shown in section in Fig. II,) it consists of a magazine 16 for containing a supply of powder and is provided with a transparent cover 17 at the front, through which the contents can be seen. This magazine is held by a nipple 18, screwed into a removable bracket 19, attached to the member 2. The main body 20 of the powder-charging apparatus containing the valve or cut-off slides 21 22 and the cylindrical charger 23 is revolubly mounted in the parts 2 and 19 by means of the nipples 24 at the top and 25 at the bottom, so as to be turned about its axis by means of a pinion 27 on the oscillating rod 28, that meshes into teeth formed at 29 on the member 20, as seen in Fig. II. This rotative movement of the member 20 and its connected parts is to cause or prevent, as may be required, engagement of the reciprocating bar 30 with the extensions 32 33 of the changing-slides 21 22. The bar 30 is attached to the member 7, as seen in Fig. XIII, and on its downward stroke the oblique face at 40 comes first in contact with the stem 32, pushing back the slide 21 and cutting off communication with the magazine 16. Then continuing, the face at 40 comes in contact with the stem 33, pushing back the slide 22, opening communication with the passage 42, so the powder in the charger 23 will descend into the shell 15. On the upward movement of the bar 30 it first releases the slide 22, which by action of the spring 43 is thrown back, closing the passage 42, and next releases the slide 21, which is by the spring 44 thrown back to the position seen in Fig. II, opening communication with the magazine 16, permitting the charger 23 to be again filled and ready for the next shell.

The powder-measuring device just described stands normally out of contact or out of line with the reciprocating bar 30, as seen in Fig. III, and is turned so the stems 32 will stand in the dotted line *a* by the pinion 27 on the oscillating stem 28 in the following manner: Referring to Figs. I and XIII, as the member 1, containing the shells 15, moves along the base of the shell sliding on the fixed member 50 comes in contact with the trip-lever 142 on the stem 28, turning this latter and the charger-chamber 20 to the position indicated by the dotted line *a* in Fig. III, so the bar 30 will on its downstroke engage the stems 32 33, and thus discharge a charge of powder into the shell 15. When the shell 15 passes the trip-lever 142, that is thrown back by means of a coil-spring 45 ready for the next shell; but if the next socket 14 contains no shell the bar 30 will pass the stems 32 33, the charger-chamber 20 will not be turned, and no powder will be discharged. This manner of operating—that is, of making the action of all the various elements from A to H depend upon the presence of a shell in the member 1—is an essential feature of my invention fully carried out in each case, as future description will explain. The stems 28 turn loosely in the member 2 at the top and at the bottom are stepped in the studs 47, set in the base member 48. Each stem is provided with a trip-lever 142, fitting loosely on the squared portion thereof, so these stems can be lifted out from the top after disengaging the coil-springs 45.

Referring now to the chargers 23, 52, 53, and 54 in Figs. II, VII, VIII, and IX, these are cylindrical in form and fit into a carefully-formed socket in the main body 20. The measuring-chambers 55 are made either parallel, as in Figs. II and VII, or of double conoidal form, as in Figs. VIII and IX, the object being to adapt the capacity of the chambers 55 to the class of powder used. Such means of regulation while sufficiently accurate for the classes of powder are not precise enough to determine charges as to their quality and strength, especially of the class known as "nitropowders," which to comply with requirements have to be determined to grains or even fractions of grains. To provide for such accurate measurement, I employ movable displacing-plugs 57, that are set outward and inward by means of screws 58, so as to determine with complete accuracy the amount of powder supplied at each charge. The cross-section of the displacing-plugs 57 can be round, as in Fig. II, for the coarser kinds of powder or angular, as in Figs. VII, VIII, and IX, for the finer kind of powder, the object being to avoid lodgment of fine powder

on the top of the plug when the chambers 55 are discharged. Jam-nuts 59 are provided to hold the screws 58 when set. The displacing-plugs 57 can be arranged in various ways—for example, be cylindrical with a screw-thread; but the construction shown has operated well in practice and is used as a proper illustration of the device.

The different chargers are marked with their capacity in drams and grains and when in use are held in place by a screw 60, so as to be instantly removed and substituted as changes in the character of the powder require.

Referring next to the elements B and C, these are to supply and insert thin wads on the top of the powder, 62 being a magazine-tube held in a split bracket 63 and supplied with wads 64, that descend by gravity as fast as removed at the bottom by the mechanism shown in plan in Fig. VI. On the top of the oscillating stem 28, which corresponds to similar stems, five in number, is placed a sector-formed driver 65, having a thin curved extension 67 with section a little thinner than the wads 64. When the stem 28 is in its normal position, turned back by the spring 45, this curved extension 67 is clear of the tier of wads in the magazine-tubes 62 and in the position seen in Fig. VI, and when the trip-lever 142 is engaged by an approaching shell, as indicated in Fig. XI, the stem 28 and the driver 65 are suddenly turned, the curved extension 67 sliding out the bottom wad 64 from the tier and passing it beneath a housing-plate 68 through a channel (indicated by dotted lines in Fig. VI) until the wad is brought over the hole 69 and concentric with a shell 15 below. Then the rammer 70 descends and presses the wad 64 down upon the powder.

The elements E and D being to supply a second wad on the powder and analogous in every respect to B and C just described, except being adapted for thicker wads 72, and as the operating parts are marked with like numerals description of these elements E and D is not required.

Referring next to the element F for measuring and supplying charges of shot, the devices employed, so far as they bear like numerals of reference, are analogous to those in the element A for powder-charges. There is, however, the difference that the slides 21 22 are, in the case of shot, liable to catch the pellets and distort or shear the same when the holes 73 in the slides pass over the holes 42 and 74 in the charger-chamber 20. To prevent this, I employ elastic washers 75, preferably made of leather, one above and one below the slide 21, which permits entrapped shot to yield and escape.

The elements G and H, to apply the final wad above the shot, correspond to those C and B or D and E, as the like numerals of reference indicate.

The final operation performed at I, that of crimping the ends of the shells, is performed by a die 83 on the rotary spindle 77, supported in the bearings 78 79 and raised by the bracket 80, that comes in contact with the collar 82, as seen in Fig. XIII. To hold the shells 15 from turning during the operation of crimping, I employ a serrated hopper-shaped die 84. (Shown in section in Fig. I and in plan view in Fig. X.) The indentures or corrugations are so made as to present a series of sharp angles or edges against the course of rotation to engage and hold the metallic base of the shells with a resistance in proportion to the pressure applied on the top by the crimping apparatus 83, which is a wide and useful distinction from embracing-clamps of any kind that require a maximum amount of force applied irrespective of the degree of downward pressure on the shell or cartridge.

In this manner it will be seen that uniform devices, the trip-levers 142 and oscillating stems 28, are employed alike in all the different operations for indication, registry, and placing the wads and that these operations are all derived from the base of the shells 15 and do not depend upon extraneous mechanism. Consequently the machinery is always in adjustment and its action dependent upon the presence of the shell itself; so false movements and waste of ammunition are not possible. It will also be seen that this actuating mechanism is of extreme simplicity, duplicate in character, and completely accessible, also can be instantly removed and replaced, if required.

Having thus explained the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In cartridge-loading apparatus, a moving member carrying the cartridges to be loaded, means to intermittently move and hold the said member, devices for receiving and delivering to the cartridges definite quantities of ammunition, rectilinearly-reciprocating valves provided with projections normally out of line with the operating means therefor, means for bringing said projections into line with the operating means, operated by contact with the moving cartridge-shells, and means for operating the valves by contact with the said projections in succession, for admitting, cutting off, and discharging the measured charges of ammunition, substantially as specified.

2. In cartridge-loading apparatus, a moving member carrying the cartridges to be loaded, a submember on which the bases of the shells slide, devices for receiving and delivering to the cartridges definite quantities of powder and shot, and for placing the wads, rectilinearly-reciprocating valves provided with projections normally out of line with the operating means therefor, a series of turning oscillating stems for determining the operative position of said projections, a series of tripping-pawls connected with said stems, engaged and operated by contact with the bases

of the moving cartridge-shells, and vertically-reciprocating cams for engaging and operating said projections when in line therewith, in succession, whereby the measured charges of ammunition are admitted, cut off, and discharged through the movement of the said valves, substantially as specified.

3. In cartridge-loading apparatus, a moving member provided with suitable seats for containing a series of cartridge-shells to be loaded, a reciprocating cross-head carrying ramming implements for wads, measuring-chambers for ammunition, rectilinearly-reciprocating valves provided with projections normally out of line with the means for operating them, arranged above and below the said measuring-chambers, springs to return said valves, means for bringing said projections into line with the operating means, operated by contact with the moving cartridge-shells, and oblique-faced bars carried on said reciprocating cross-head, in the path of said projections when in line, acting as cams to close and open said reciprocating valves in succession, and on the reverse movement to close and open the same in the reverse order, whereby the measuring-chambers are cut off, emptied and filled in succession by the movement of the cross-head coöperating with the chamber-turning mechanism, substantially as specified.

4. In cartridge-loading apparatus, charging devices containing chargers for powder and shot, each of said devices revolubly mounted in fixed bearings by means of hollow nipples at the top and bottom thereof, rectilinearly-reciprocating valves in said devices arranged one above the other, provided with projections normally out of line with the operating means therefor, means for bringing said projections into line with the operating means, operated by contact with the moving cartridge-shells, a moving support for the cartridge-shells and a vertically-reciprocating cam, operating on said projections when in line, in succession, thereby alternately closing and opening the chambers at top and bottom to discharge and fill the same in succession, substantially as specified.

5. In cartridge-loading apparatus, charging devices containing chargers for powder and shot, each of said devices revolubly mounted in fixed bearings by means of hollow nipples at top and bottom thereof, rectilinearly-reciprocating valves in said devices arranged one above the other, provided with projections normally out of line with the means for operating them, a turning oscillating stem for determining the operative position of said projections, means connected with said stems engaged and operated by contact with the bases of the moving cartridge-shells, a moving support for the cartridge-shells and a vertically-reciprocating cam for engaging and operating said projections when in line therewith, thereby alternately closing and opening the passages to and from said chargers, substantially as specified.

6. In cartridge-loading apparatus, a revolubly-mounted charging device containing a transversely-inserted charger, rectilinearly-reciprocating spring-valves above and below said charger, provided with projections normally out of line with the operating means therefor, a reciprocating cam for engaging said projections in succession when in line, an oscillating stem in geared connection with the said charging device, a moving support for the cartridge-shells, a trip-lever on said stem for engagement with the bases of the moving cartridge-shells, thereby bringing the engaging projections on the valves into line with the said reciprocating cam, operating the valves in succession when a cartridge is passing, and leaving the valves undisturbed when no cartridge is in place to be filled, substantially as specified.

7. In cartridge-loading apparatus, a revolubly-mounted charger-holding member, removable chargers inserted transversely in said charger-holding member, chambers diametrically through said chargers holding measured charges of ammunition, and a displacing-plug, set longitudinally in said chargers, entering said chambers, and adjustable from the outside, whereby minute changes in the capacity of the charger-chambers can be made, substantially as specified.

8. In cartridge-loading apparatus, insertible chargers having transverse chambers for measured charges of ammunition, adjustable displacing-plugs set longitudinally in said chargers, entering said chambers, of angular or prismatic section at top, whereby the introduced ammunition will not find lodgment thereon, substantially as specified.

9. In cartridge-loading apparatus, a sheath to contain a tier of wads, a reciprocating rammer, with means for operating the same, a partially-revolving vertical stem, with means for turning the same on the passage of a cartridge-shell, an angularly-moving plate at the top of the stem having a thin curved extension 67 for engagement with the bottom wad of the tier of wads, and a curved guideway to guide the wad on its passage to its seat over the cartridge-shell, substantially as specified.

10. In cartridge-loading apparatus, a sheath to contain a tier of wads, a reciprocating rammer to drive the wads, a partially-revolving vertical stem, a tappet-lever on said stem for turning the same by contact with an advancing cartridge-shell, a sector-shaped pivoted driver 65 having a thin curved extension, a member 67 at the top of said stem moving in a curved path and engaging the bottom wad of said tier, a curved way to guide the wad on its passage to its seat over the cartridge-shell, and a cover-plate 68 over said guideway, having an aperture 69 for the passage of the rammer, substantially as specified.

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