No. 660,244. Patented Oct. 23, 1900.

J. M. BROWNING.

MACHINE FOR LOADING FEED BELTS FOR MACHINE GUNS.

(Application filed Nov. 15, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

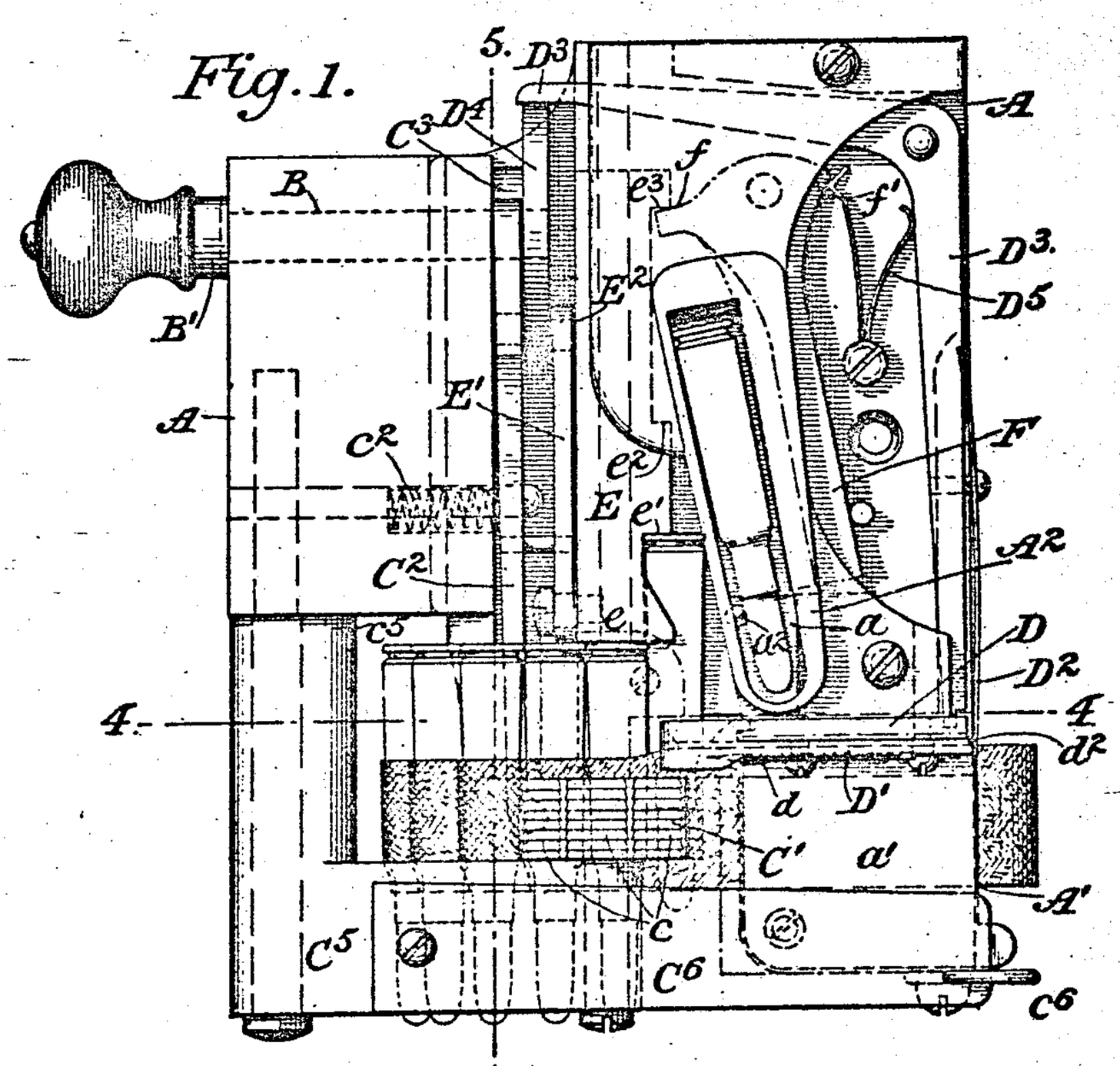
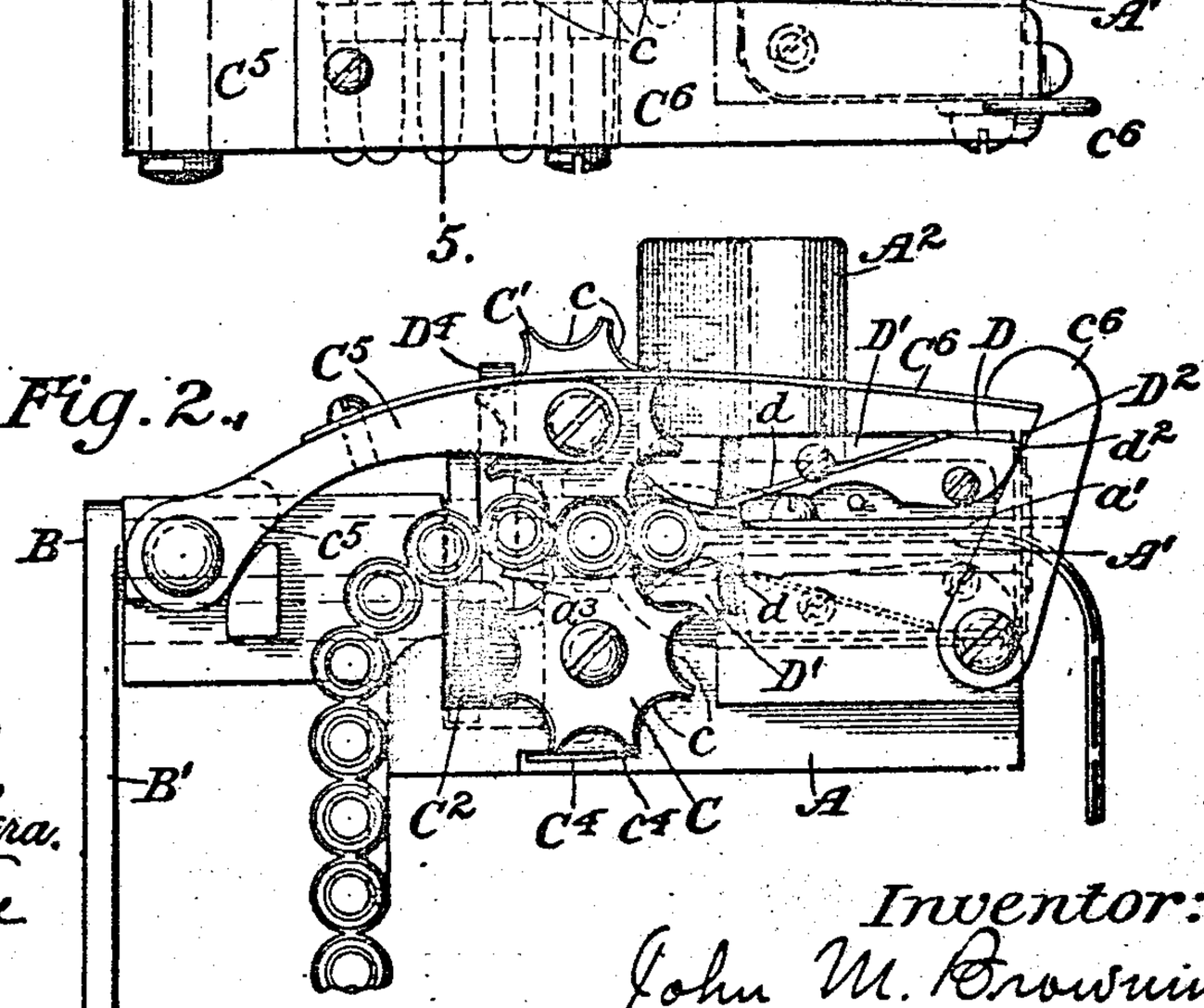


Fig. 2.



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(No Model.) 4 Sheets—Sheet 2.

Fig. 3.

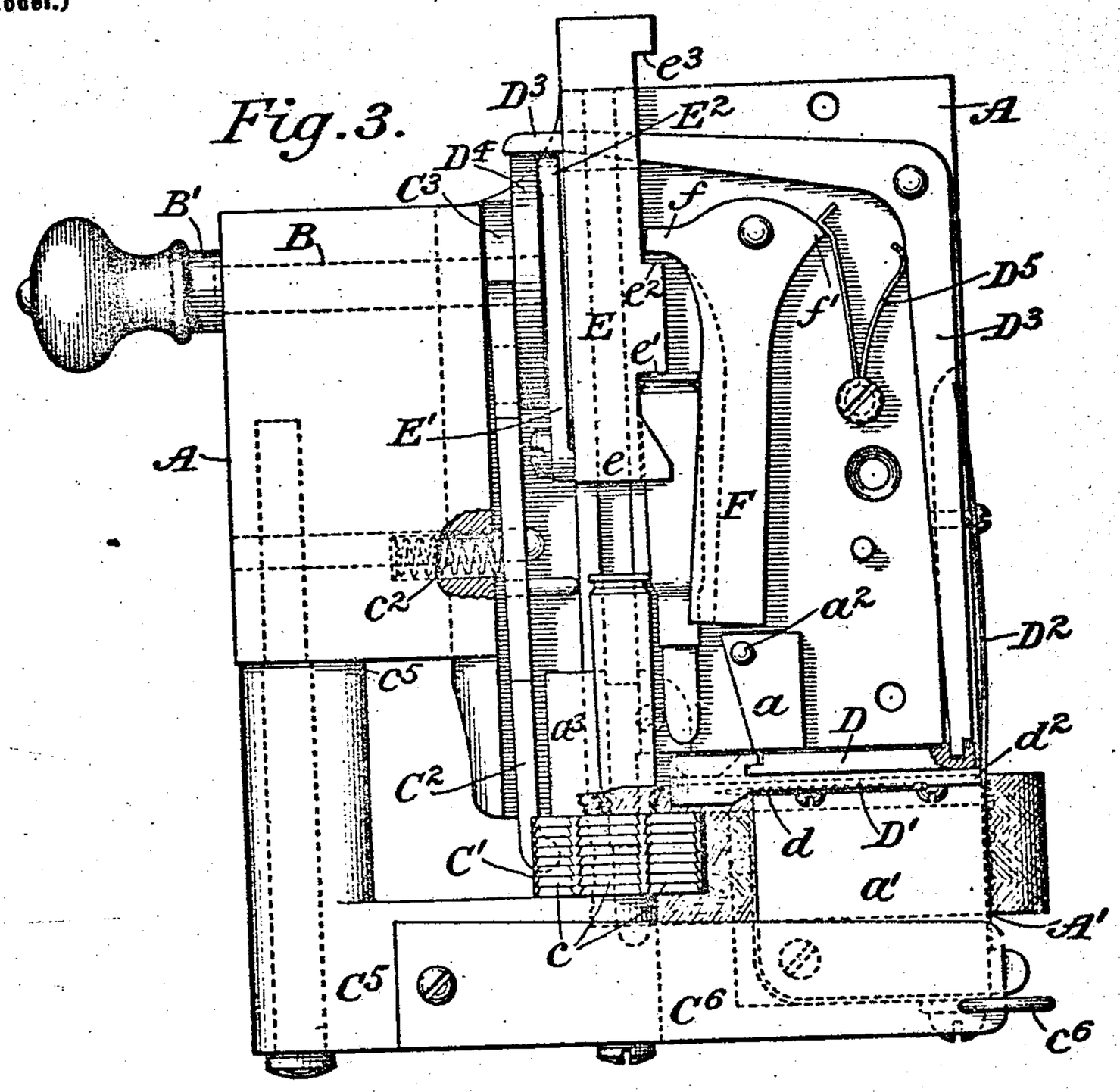
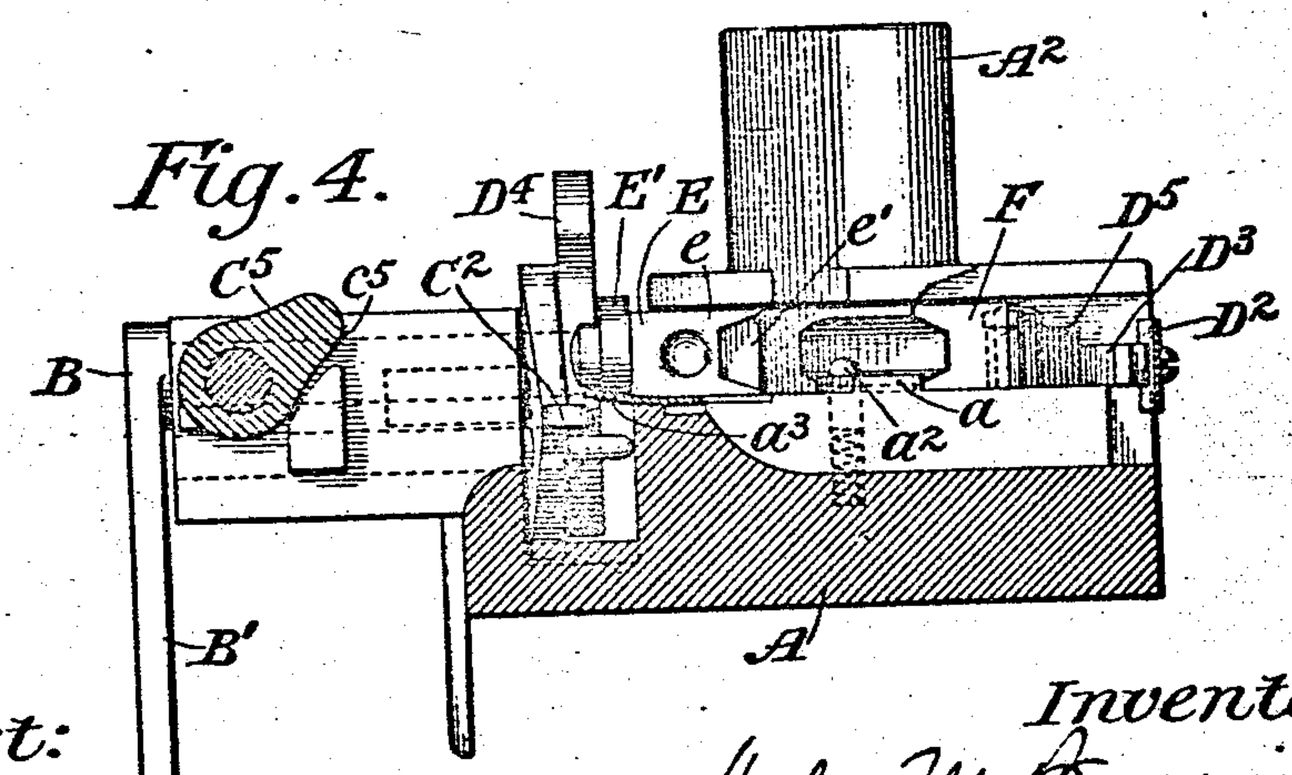


Fig. 4.



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(No Model.) 4 Sheets—Sheet 3.

Fig. 5.

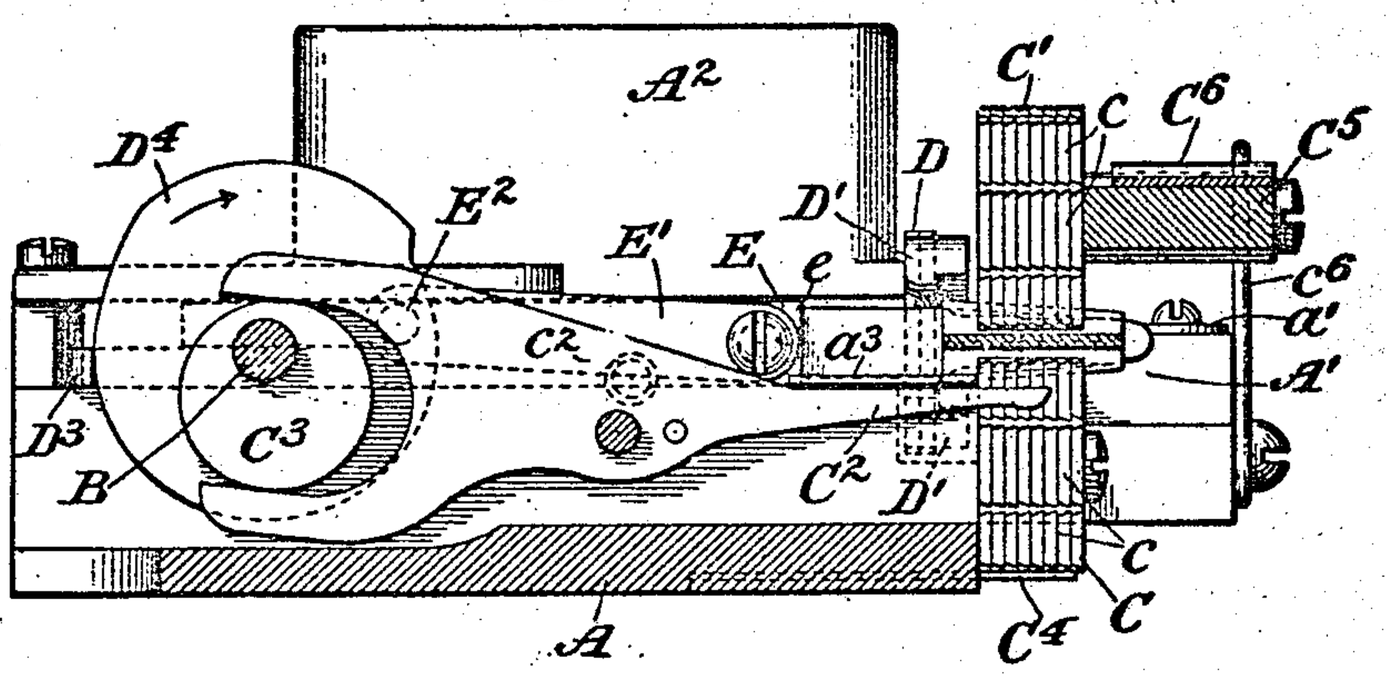


Fig. 6.

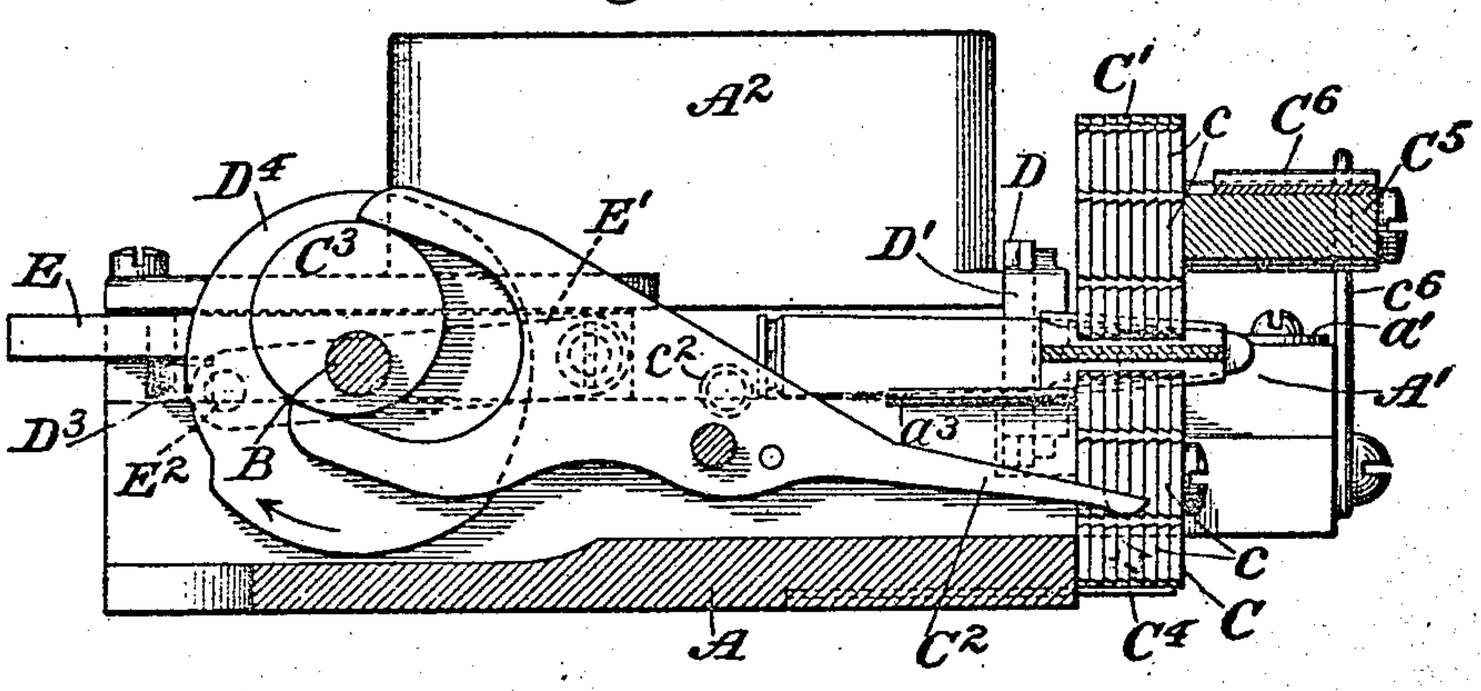
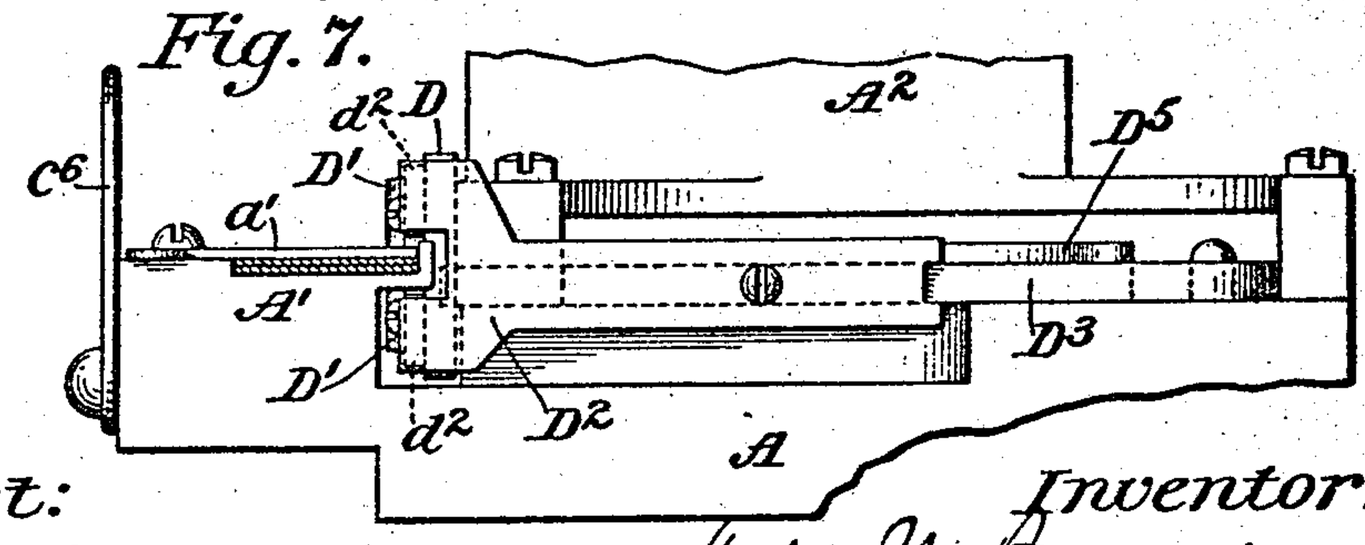


Fig. 7.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 8.

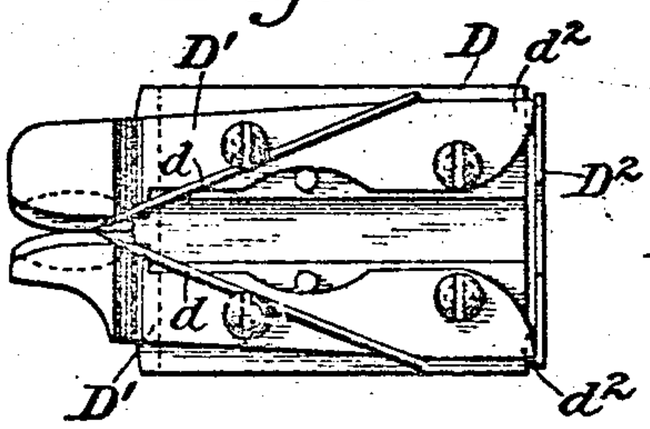

Fig. 9.

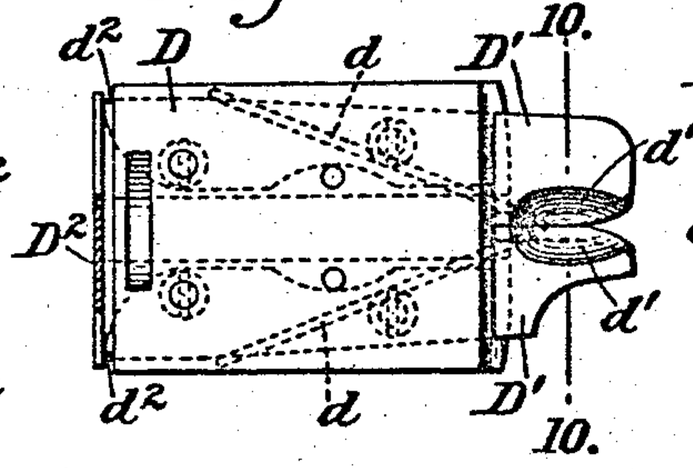

Fig. 10.

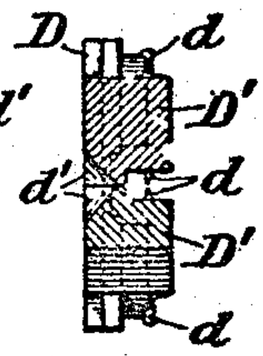

Fig. 11.

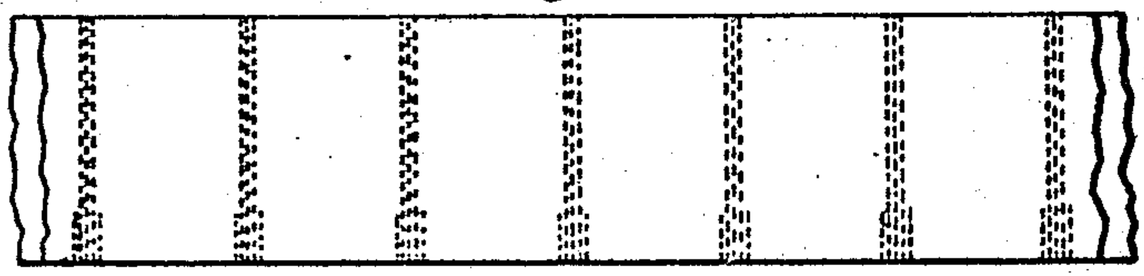

Fig. 12.

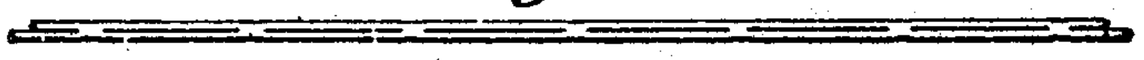

Fig. 13

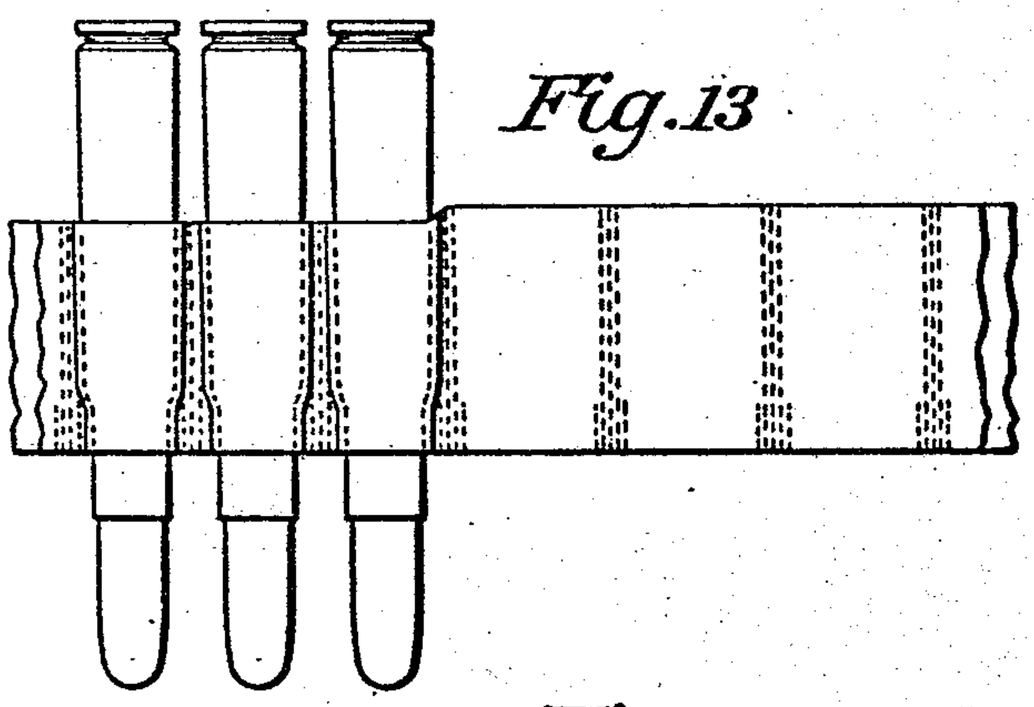

Fig. 14.

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UNITED STATES PATENT OFFICE.

JOHN M. BROWNING, OF OGDEN, UTAH.

MACHINE FOR LOADING FEED-BELTS FOR MACHINE-GUNS.

SPECIFICATION forming part of Letters Patent No. 660,244, dated October 23, 1900.

Application filed November 15, 1899. Serial No. 737,068. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. BROWNING, a citizen of the United States, residing in Ogden, county of Weber, State of Utah, have invented certain new and useful Improvements in Machines for Loading Feed-Belts for Machine-Guns, &c., of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

The object of this invention is to provide an improved machine for inserting cartridges in feed-belts by which the cartridges are subsequently fed to machine-guns. It is desirable that such feed-belts should be light in weight, flexible, capable of holding the cartridges close together, and inexpensive. The possession of these qualities renders it necessary to avoid the use of beaded edges and of metallic strips between the pockets, and hitherto no satisfactory mechanical devices have been provided for opening or holding open the pockets in such belts for the insertion of the cartridges or for holding the belts during the insertion of the cartridges, it being understood that in such belts the pockets for the reception of the cartridges are formed between two layers or plies of fabric united between the pockets and are transversely disposed with respect to the belt. By the present invention, however, provision is made for opening each pocket and holding it open for the insertion of the end of the cartridge by means which engage the fabric externally, whereby it becomes unnecessary to clamp the belt at such time, as is the case when an opener is forced into the pocket, and whereby also each pocket is certainly opened at the proper time and cannot close before the cartridge is introduced. Thereafter in the improved machine the belt is firmly held while the cartridge is pushed into it to the desired extent. These mechanical devices and others which it may be found advantageous to combine therewith in practice will be fully described hereinafter with reference to the accompanying drawings, in which for purposes of illustration and explanation of the nature of the invention they are illustrated as embodied in convenient and practical forms and as combined in a single machine which performs all of the necessary operations of loading the belts.

In the drawings, Figure 1 is a plan view of such a machine with its parts in their initial positions, a partly-loaded belt being represented in place in the machine. Fig. 2 is an end elevation of the same. Fig. 3 is a plan view with the cartridge-feeding guide or hopper removed, the parts being represented in the positions which they assume when the driving-shaft has been rotated one hundred and eighty degrees from the position indicated in Figs. 1 and 2. Fig. 4 is a section on the plane indicated by the line 4 4 of Fig. 1 looking in the direction of the arrow. Fig. 5 is a section on the plane indicated by the line 5 5 of Fig. 1. Fig. 6 is a similar view, but with the parts in the positions indicated in Fig. 3. Fig. 7 is a detail rear elevation. Figs. 8 and 9 are respectively a front elevation and a rear elevation of the opener detached. Fig. 10 is a section on the plane indicated by the line 10 10 of Fig. 9. Figs. 11 and 12 are plan and edge views of a portion of an unloaded belt. Figs. 13 and 14 are similar views of a partly-loaded belt, the cartridges being indicated by dotted lines.

In the machine shown in the drawings the several working parts are supported upon a suitable bed-plate A, which can be secured wherever convenient for the operation of the machine. In suitable bearings on the bed-plate is mounted a short shaft B, which may be operated by any convenient means, a crank-handle B′ being indicated. The several working parts of the machine are operated either directly or indirectly from the shaft B, as will be described hereinafter. The belt or band to be filled (shown particularly in Figs. 11, 12, 13, and 14) is preferably a woven belt or band having two plies, which are united transversely at regular intervals, the pockets for the reception of the cartridges being formed between the two plies and separated from one another by the lines of union of the two plies. It is obvious, as clearly shown in the said figures of the drawings, that such a belt will be taken up somewhat both in width and in length by the insertion of the cartridges in the pockets. The belt is delivered through a guide A′, in which it may be held

by a pivoted cap or cover a', the belt or band passing freely through such guide. The cartridges to be inserted in the belt or band may be delivered to the machine in any convenient manner. There is shown at A^3 in the drawings a guide or feed chute, which is secured upon the bed-plate above some of the working parts of the machine and in which the cartridges are held one above another for delivery to the devices, which insert them one by one in the belt.

The belt-feeding devices, whicl engage the filled portion of the belt, will first be described. These comprise two fluted wheels C and C', the flutings being suitably toothed or roughened, as indicated at c, that they may engage the belt and hold it as each cartridge is being pushed home. These feed-wheels receive a step-by-step motion, the lower wheel being engaged by a pawl C^2, which is loosely pivoted upon the bed-plate A and is actuated by an eccentric C^3 on the shaft B, the pawl and the eccentric strap or fork being conveniently formed in one piece. The pawl is loosely pivoted, as above stated, so that it may have some lateral play in order to permit the end which engages the fluted wheel to pass over the ridges between the flutings in one direction, a spring c^2 bearing against the pawl to insure its proper engagement with the feed-wheel when moving in the opposite direction. The feed-wheel C is by the pawl C^2 brought to the exact position at each operation and there held by a blade-spring C^4, which engages the under side of the feed-wheel and prevents its movement in either direction. The right-hand edge of the spring C^4 is slightly upturned, as at c', to engage the rear side of the ridge which has just passed it, thus positively preventing backward movement of the feed-wheel, while the upward pressure of the spring C^4 is exerted against the next ridge in a vertical plane considerably to the left side of that through the axis of the feed-wheel, thereby forcing the right-hand ridge against the edge of the spring c^4 and preventing forward rotation of the feed-wheel. The upper feed-wheel C' is in the nature of a presser to coöperate with the lower feed-wheel. It is carried by a pivoted crane or arm C^5, so that it may be swung toward or from the lower feed-wheel, such crane having a shoulder c^5 to engage a corresponding stop on the bed-plate, so that the upper feed-wheel cannot at any time come in contact with the lower feed-wheel nor press too hard upon the cartridge which at the time may be in the belt between the two wheels. At the same time in order that the wheel C' may be held yieldingly toward the wheel C a spring C^6 is extended from the pivoted rigid arm C^5 and is engaged by a suitable latch c^6, carried by the bed-plate.

As indicated hereinbefore, the opener, the function of which is to open each pocket previous to the introduction of the cartridge, is arranged to operate externally as distinguished from the operation of an opener which is thrust into the pocket. It will be obvious that many different forms of devices might be devised to engage the fabric which forms the walls of the pocket and to pull the pocket open, as well as that one side wall of the pocket may be pulled away from the other to form an opening for the insertion of the end of the cartridge or that both side walls may be pulled away in opposite directions from a central line. It will also be understood that the opener may be operated by various means. In the construction which has been chosen for illustration in the drawings, however, the opener is arranged to engage both side walls of each pocket to pull them from a central line, and the opener is arranged to be operated by the forward movement of each cartridge as it is advanced for insertion into the pocket. As shown most clearly in Figs. 8, 9, and 10 of the drawings, this form of opener comprises a carrier D, which is arranged to slide on the edge of the guideway A', being loosely mounted thereon, and two jaws or arms D', which are pivoted to the carrier on opposite sides of the plane of the belt or band as it passes over the guide A'. Each arm or jaw is provided with a point or needle d, which is extended forwardly toward the belt in a position to enter or engage but not to penetrate the corresponding pocket-wall of the belt or band as the carrier moves forward. The rear end of each arm or jaw is extended to form a toe d^2 for the bearing of a spring D^2, the function of which is to hold the points toward each other with a yielding pressure and is not to impel the opener forward, the spring being carried by the arm which effects the to-and-fro movement. Upon the rear faces of the two arms or jaws, near their forward ends and at their proximate edges, the two arms or jaws are chamfered or milled out, as at d', to form a cam-like surface on each, so that as the cartridge is thrust forward, as hereinafter described, its end will engage the cam-like surfaces and will thrust the two arms or jaws apart. The walls of the pocket being at the time engaged by such arms or jaws, the pocket will be opened in readiness for the introduction of the cartridge as its forward movement is continued. The cam-surfaces are preferably somewhat conical, as they will thereby serve to center the end of the cartridge as it is thrust forward, insuring its proper alinement with the pocket. To effect the to-and-fro motion of the opener, a bell-crank lever D^3 is mounted upon the bed-plate A, one arm engaging the carrier D, while the other engages a cam D^4 on the shaft B. A spring D^5, also mounted on the bed-plate, coöperates with one arm of the bell-crank lever D^3 to hold the lever in contact with the cam and to draw the opener back, the forward movement of the opener being effected by the cam. The spring D^2, above referred to, is secured to the lever D^3, and

therefore has no influence upon the to-and-fro movement of the carrier.

Any desired form of mechanism may be employed for thrusting the cartridges into the pockets of the belt or band; but in the machine represented in the drawings a plunger E is employed for the purpose, such plunger being mounted and suitably guided on the bed-plate A and being connected by a rod or pitman E' with a crank-pin E^2, carried at the inner end of the shaft B. The plunger is arranged to insert one cartridge part way into the pocket just opened at the same time that it thrusts home the cartridge which was previously inserted part way and which is then in the belt in the grasp of the wheels C C'. For this purpose the plunger is formed in rear of its head *e* with a lateral shoulder *e'*, which is adapted to engage the head of the second cartridge. The side of the plunger between the head *e* and the shoulder *e'* is grooved to assist in centering and holding the second cartridge before its point engages the belt. The plunger is also formed with two shoulders e^2 e^3 for a purpose to be described presently. As already described, the cartridge guide or feed chute A^2 is mounted upon the bed-plate A, but with sufficient clearance for the working parts beneath it. Immediately below the cartridge-feed chute an arm F is pivoted upon the bed-plate A, being arranged to swing back from the line of the chute far enough to allow a cartridge to drop down in front of it and then to swing forward to carry such cartridge into position to be engaged by the shoulder *e'* of the plunger E, the front side of the arm being grooved longitudinally to coöperate with the corresponding groove in the side of the plunger to center the cartridge and hold it in position for insertion into the opening pocket. A toe *f* is formed on the arm near its pivot for engagement with one or the other of the shoulders e^2 e^3 on the plunger E, and on the other side of its pivot it is formed with a toe *f'* for coöperation with one member of the spring D^5, above referred to. In the rearward movement of the plunger E the shoulder e^2 thereof strikes the toe *f* of the arm F and carries the toe *f'* past the spring D^5, so that it then acts upon the other side of the toe *f'* to throw the arm forward smartly. In like manner the shoulder e^3 at the end of the forward movement of the plunger forces the point of the toe *f'* past the spring in the opposite direction, so that the spring throws the arm back smartly into position to permit another cartridge to drop down from the feed-chute. It will be seen that the arm furnishes a guide for the cartridge as it is driven forward by the shoulder *e'* of the plunger E. In order that each cartridge, notwithstanding the relatively-smaller diameter of the bullet as compared with the head of the cartridge, may be properly supported beneath the mouth of the feed-chute and properly directed into the opening pocket, and particularly that it may be properly gaged between the grooved portions of the plunger and the arm, a step *a* is formed upon the bed-plate, which serves to lift the bullet end of the cartridge to the proper height, and thus to prevent the column of cartridges in the feed-chute from interfering with the movement of the cartridge beneath the chute. Furthermore, since the cartridge is less likely to get into a wrong position if it is thrown forward by the arm and immediately followed by the arm a spring-seated friction-plunger a^2, of ordinary construction, is located in the bed-plate, preferably in the step *a*, and serves to hold the cartridge until it is thrown forward and immediately followed by the arm yieldingly as the cartridge passes over it.

In the operation of the machine described herein two cartridges are first placed in the belt by hand and then, with the working parts of the machine in the positions indicated in Figs. 1, 2, and 5 of the drawings, the upper feed-wheel C' is released and raised, the first cartridge is placed in the uppermost fluting of the feed-wheel C, the feed-wheel C' is returned to position and secured by the latch, and the machine is started, it being premised that cartridges are supplied to the cartridge-chute and that the belt is properly placed in the belt-guide. During the first half of the rotation of the shaft the pawl C^3 is actuated to advance the feed-wheels one step, thereby drawing the belt forward to bring the first empty pocket into position to receive a cartridge. At the same time the plunger E is drawn back, causing the arm F to throw the lowermost cartridge against the plunger, with its head just in advance of the shoulder *e'*. During the second half of the rotation of the shaft the cam D^4 moves the opener forward, causing its points to engage the opposite walls of the first empty pocket. Meanwhile the plunger E moves forward, so that as soon as the walls of the pocket have been fairly engaged by the opener the end of the cartridge will be brought against the chamfered portions of the opener-jaws and will cause the jaws to open, thereby also separating the walls of the pocket. The continued forward movement of the plunger pushes the cartridge forward into the pocket far enough to be retained and carried on by the belt when the next movement of the feed-wheels is produced. The opener is allowed by its cam to retire as soon as it has accomplished its purpose and the cartridge has been fairly introduced into the pocket. The rotation of the shaft being now completed and continued, the operations of the machine are repeated as before, except that the cartridge which was first partly introduced is brought into line with the plunger E between the two feed-wheels and at the next forward movement of the plunger is pushed home, the belt being held by the teeth or corrugations of the flutings. A guide-plate a^3 is secured to the bed-plate A at its edge to raise the belt,

with the cartridges, slightly as they pass over it and prevent them from dragging down and moving out of proper position as they leave the feed-wheel.

It will now be clear that various changes can be made in the details of construction and arrangement and that the invention is not to be limited to the precise form and combination of parts shown and described herein.

I claim as my invention—

1. In a machine for loading pocketed belts, an opener adapted to engage the pocket-wall and means to move said opener away from the plane of the belt.

2. In a machine for loading pocketed belts, an arm or jaw having a point to engage the pocket-wall and means to move said arm or jaw away from the plane of the belt.

3. In a machine for loading pocketed belts, a carrier, an arm or jaw mounted on said carrier and adapted to engage the pocket-wall, means to move the carrier to and fro and means to move said arm or jaw away from the plane of the belt.

4. In a machine for loading pocketed belts, the combination of a belt-guide, a carrier mounted in proximity to said guide, means to move said carrier to and fro, an arm or jaw mounted on said carrier and having a point to engage the pocket-wall, and means to move said arm or jaw away from the plane of the belt.

5. In a machine for loading pocketed belts, the combination of a belt-guide, a carrier mounted in proximity to said guide, arms or jaws mounted on said carrier on opposite sides of the plane of the guides and adapted to engage the opposite pocket-walls, and means to separate said arms or jaws.

6. In a machine for loading pocketed belts, the combination of a belt-guide, a carrier mounted in proximity to said guide, means to move said carrier to and fro, arms or jaws pivoted upon said carrier and having each a point projecting forwardly and toward the plane of the guide, a spring acting upon said arms or jaws to press said points yieldingly toward each other, and means to separate said arms or jaws.

7. In a machine for loading pocketed belts, the combination of an opener adapted to engage the pocket-wall, and means to press a cartridge forward in line with the pocket and against the opener to move the same from the plane of the belt.

8. In a machine for loading pocketed belts, the combination of an arm or jaw having a point to engage the pocket-wall and means to press a cartridge forward in line with the pocket and against the arm or jaw to move the same from the plane of the belt.

9. In a machine for loading pocketed belts, the combination of a carrier, an arm or jaw mounted on said carrier and adapted to engage the pocket-wall, means to move the carrier to and fro, and means to press a cartridge forward in line with the pocket and against the opener to move the same from the plane of the belt.

10. In a machine for loading pocketed belts the combination of a belt-guide, a carrier mounted in proximity to said guide, arms or jaws mounted on said carrier on opposite sides of the plane of the guide and adapted to engage the opposite pocket-walls, and means to press a cartridge forward in line with the pocket and against said arms or jaws to separate them.

11. In a machine for loading pocketed belts, the combination of a fluted feed-wheel, means to actuate the same, a second fluted feed-wheel, and means to press the last-named wheel yieldingly toward the first-named wheel.

12. In a machine for loading pocketed belts, the combination of a fluted feed-wheel, means to actuate the same, a second fluted feed-wheel, a pivoted, rigid arm carrying said last-named wheel and having a stop to limit the movement of the last-named wheel toward the first-named wheel, and means to hold the last-named wheel toward the first-named wheel.

13. In a machine for loading pocketed belts, the combination of a fluted feed-wheel, means to actuate the same, a second fluted feed-wheel, a pivoted, rigid arm carrying said last-named wheel and having a stop to limit the movement of the last-named wheel toward the first-named wheel, a spring extension from said arm, and a latch to engage said spring extension.

14. In a machine for loading pocketed belts, the combination of a fluted feed-wheel, an actuating-pawl adapted to engage the ridges between the flutings, and a flat spring engaging the ridges of the wheel with its edge in rear of one of such ridges.

15. In a machine for loading pocketed belts with cartridges, the combination with a pocket-opener, and means to hold the belt while the cartridge is thrust home, of a cartridge-feeding mechanism having a head or shoulder in line with the opened pocket to insert the cartridge and a head or shoulder in line with the belt-holding means to thrust the cartridge home.

16. In a machine for loading pocketed belts with cartridges, the combination with a pocket-opener, and means to hold the belt while the cartridge is thrust home, of a reciprocating plunger having a head or shoulder in line with the opening pocket and a head or shoulder in advance of the first-named head or shoulder and in line with the belt-holding means.

17. In a machine for loading pocketed belts with cartridges, the combination with means for holding the belt, of a cartridge-feeding mechanism having a head or shoulder to insert the cartridge into a pocket and a second head or shoulder in advance of the first-named head or shoulder and in line with the next pocket to thrust the cartridge home.

18. In a machine for loading pocketed belts with cartridges, the combination with means for holding the belt, of a reciprocating plunger having a head or shoulder in line with one pocket and a head or shoulder in advance of the first-named head or shoulder and in line with the next pocket.

19. In a machine for loading pocketed belts with cartridges, the combination of fluted, belt feeding and holding wheels, means to advance said wheels step by step, an opener adapted to engage the pocket-wall, and a reciprocating plunger having a head or shoulder to thrust a cartridge against the opener to move the same away from the plane of the belt and to insert the cartridge in the opened pocket, said plunger having also a head or shoulder in line with the belt feeding and holding wheels to thrust the cartridge home.

20. In a machine for loading pocketed belts with cartridges, the combination with means for holding the belt, of a reciprocating plunger having a head or shoulder in line with one pocket and a head or shoulder in advance of the first-named head or shoulder and in line with the next pocket, said plunger being longitudinally grooved between said heads or shoulders to receive the cartridge, and means to press the cartridge against said grooved portion of the plunger.

21. In a machine for loading pocketed belts with cartridges, the combination with a horizontal bed-plate, and a cartridge-chute above the bed-plate and adapted to receive the cartridges horizontally, one upon another, said chute having sufficient clearance above the bed-plate to permit the passage of a cartridge in a horizontal position, of an arm pivoted upon the bed-plate to swing across the mouth of the chute in contact with a cartridge, means to operate said arm, and means to push the cartridge forward horizontally in the direction of its length.

22. In a machine for loading pocketed belts with cartridges, the combination with a horizontal bed-plate, and a cartridge-chute above the bed-plate and adapted to receive the cartridges horizontally, one upon another, said chute having sufficient clearance above the bed-plate to permit the passage of a cartridge in a horizontal position, of an arm pivoted upon the bed-plate to swing across the mouth of the chute in contact with a cartridge, means to operate said arm, and a reciprocating plunger to push the cartridge forward horizontally in the direction of its length.

23. In a machine for loading pocketed belts with cartridges, the combination of a reciprocating plunger, a horizontal bed-plate, a cartridge-chute above the bed-plate and adapted to receive the cartridges horizontally, one upon another said chute having a sufficient clearance above the bed-plate to permit the passage of a cartridge in a horizontal position, an arm pivoted upon the bed-plate to swing across the mouth of the chute in contact with a cartridge, said arm having a longitudinal groove to center the cartridge, and means to operate said arm to transfer the cartridge from the chute to the path of said plunger.

24. In a machine for loading pocketed belts with cartridges, the combination of a horizontal bed-plate, a reciprocating plunger, a cartridge-chute mounted above the bed-plate and adapted to receive the cartridges horizontally, one upon another, an arm pivoted upon the bed-plate to swing between the bed-plate and the chute across the mouth of the chute, and operative connections between said plunger and said arm to cause the latter to transfer the cartridge from the chute to the path of the plunger.

25. In a machine for loading pocketed belts with cartridges, the combination of a bed-plate, a reciprocating plunger, a cartridge-chute mounted upon the bed-plate, an arm mounted to move between the bed-plate and the chute across the mouth of the chute, means to operate said arm to transfer the cartridge from the chute to the path of the plunger, and a friction-stop in the bed-plate in the path of the cartridge.

26. In a machine of the character described, the combination of a reciprocating plunger, a cartridge-chute, and a pivoted arm mounted to move across the mouth of said chute to transfer the cartridge from the chute to the path of the plunger, said arm having a toe engaged by a shoulder or projection on the plunger to be operated thereby.

27. In a machine of the character described, the combination of a reciprocating plunger, a cartridge-chute, a pivoted arm mounted to move across the mouth of said chute to transfer the cartridge from the chute to the path of the plunger, said arm having a toe engaged by a shoulder or projection on the plunger to be operated thereby and having a second toe, and a spring adapted to engage said second toe on one side and on the other as the arm is moved.

This specification signed and witnessed this 26th day of October, A. D. 1899.

JOHN M. BROWNING.

In presence of—
JOHN E. RAMSDEN,
J. ZITZMAN.