(No Model.) 2 Sheets—Sheet 1.

G. P. SALISBURY.

Paper Cartridge Machine.

No. 237,605. Patented Feb. 8, 1881.

fig. 1

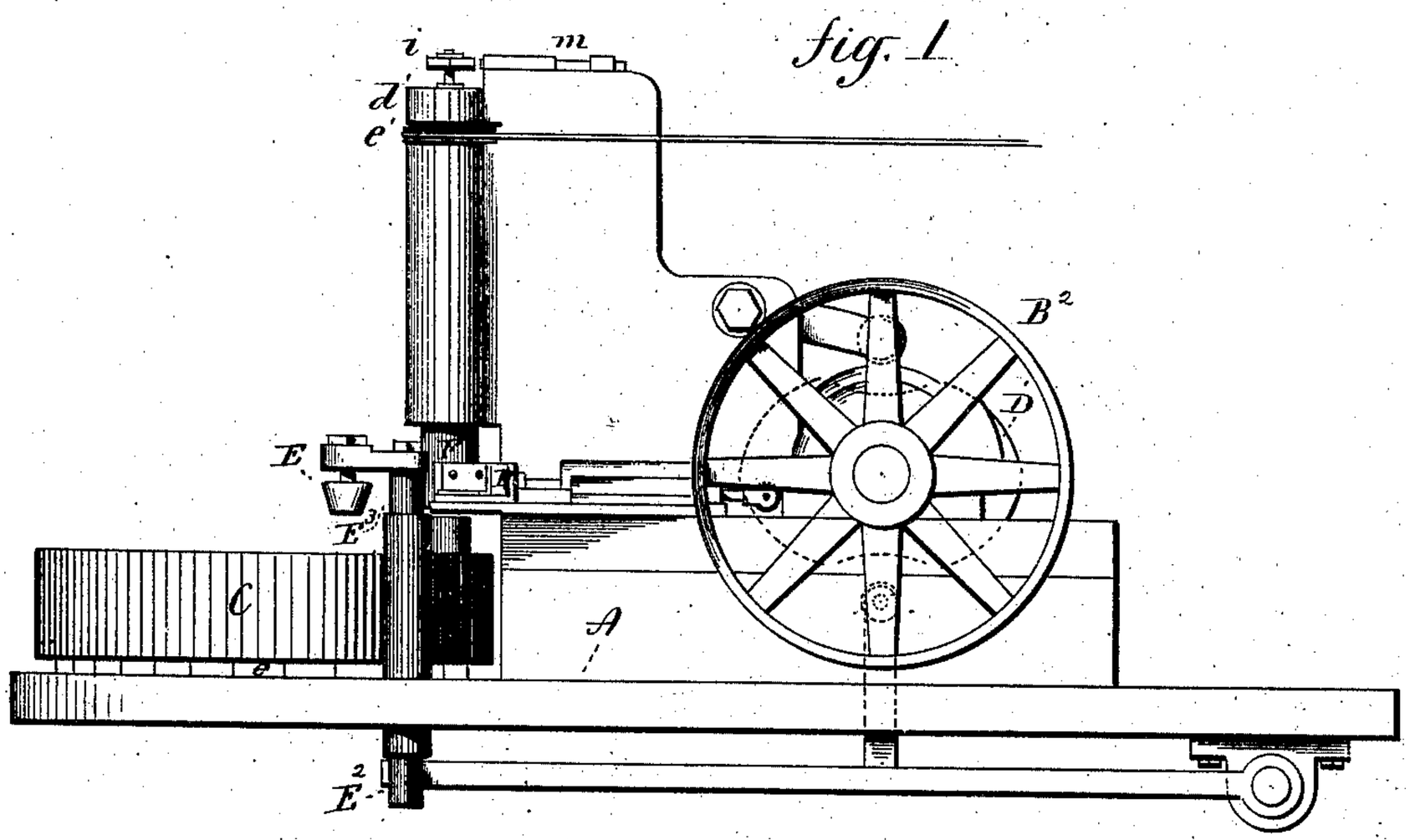
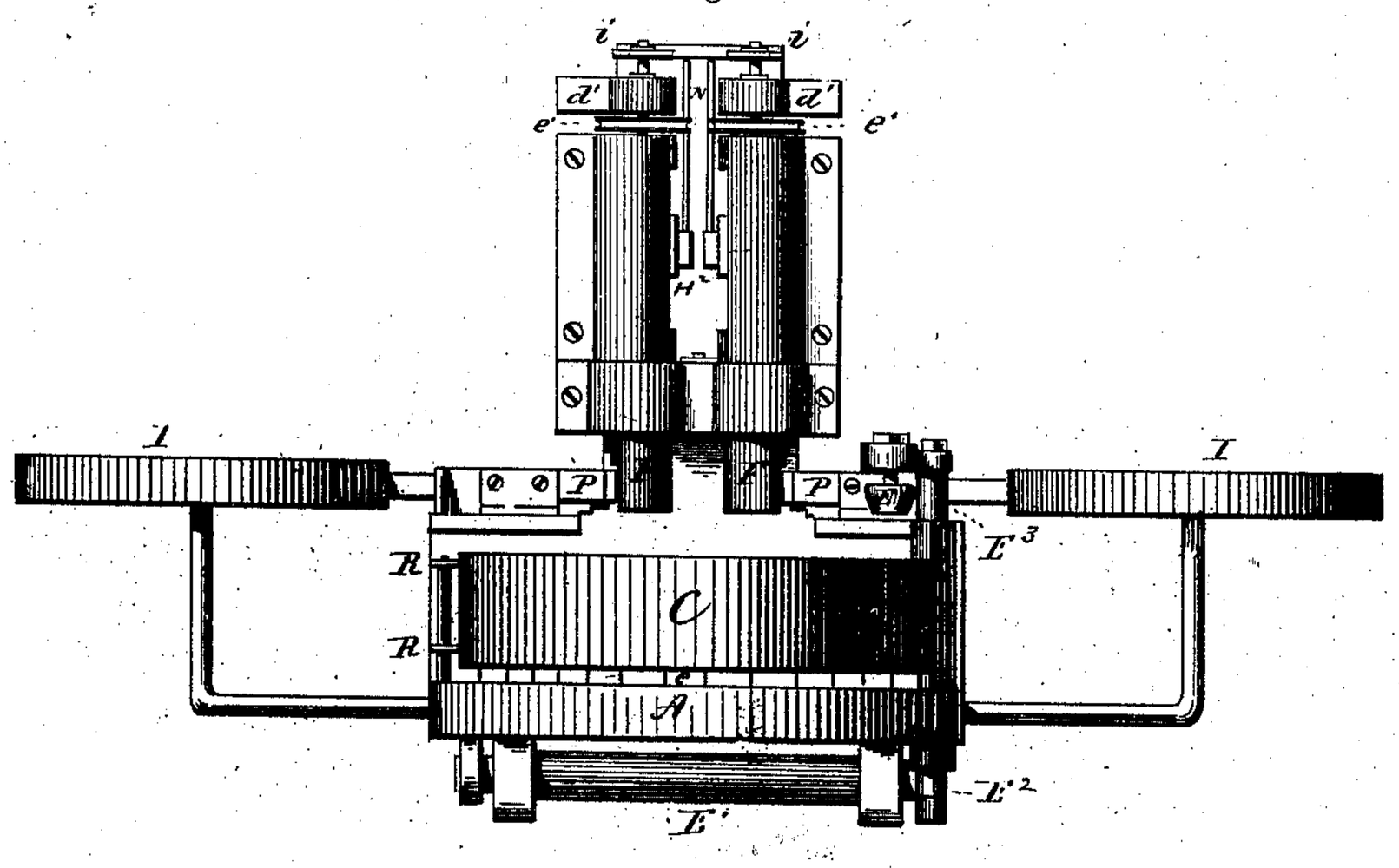


fig. 2



Witnesses.
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By atty.
Wm. E. Earle

(No Model.) 2 Sheets—Sheet 2.

G. P. SALISBURY.

Paper Cartridge Machine.

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fig. 3

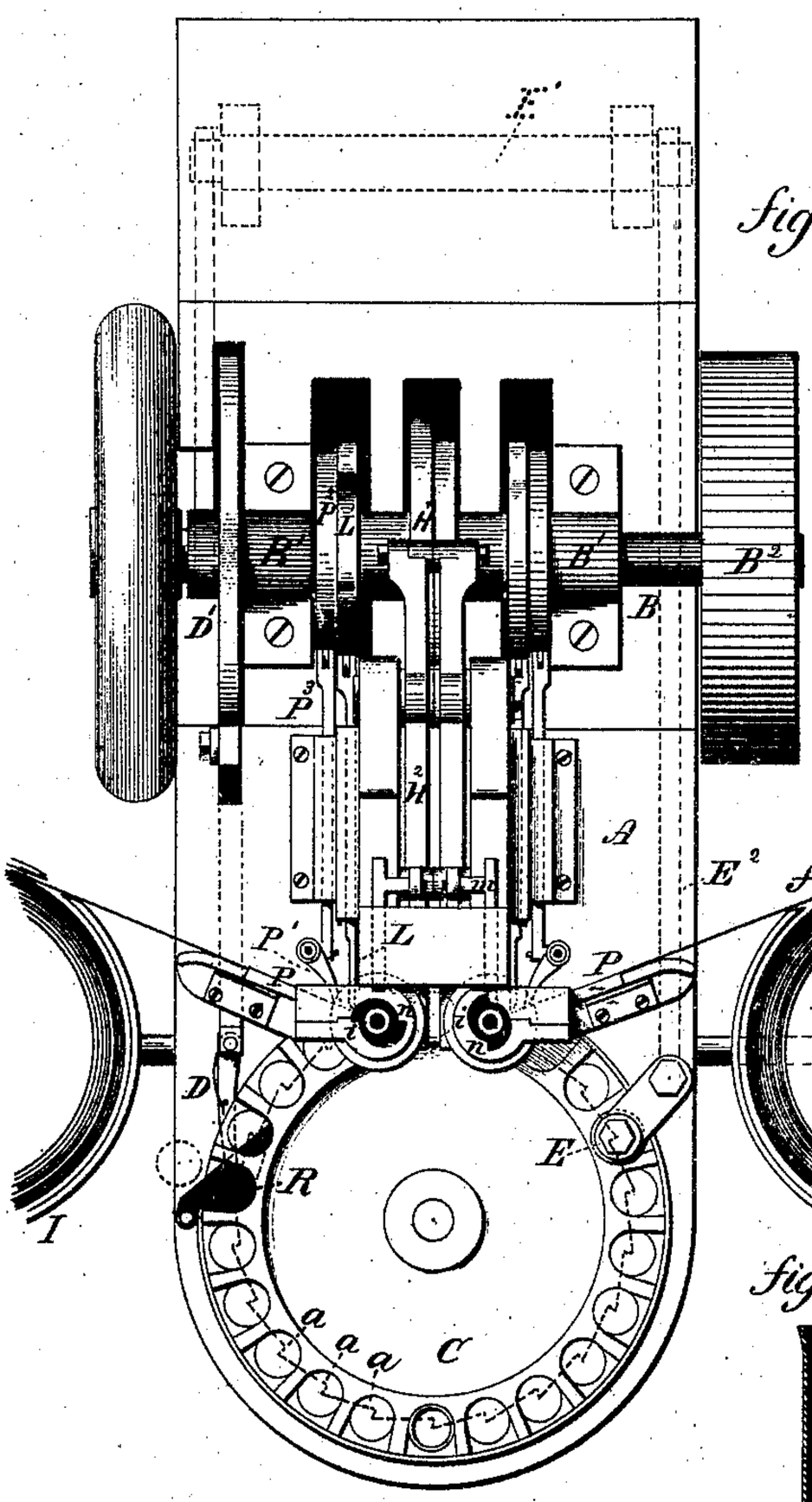


fig. 6

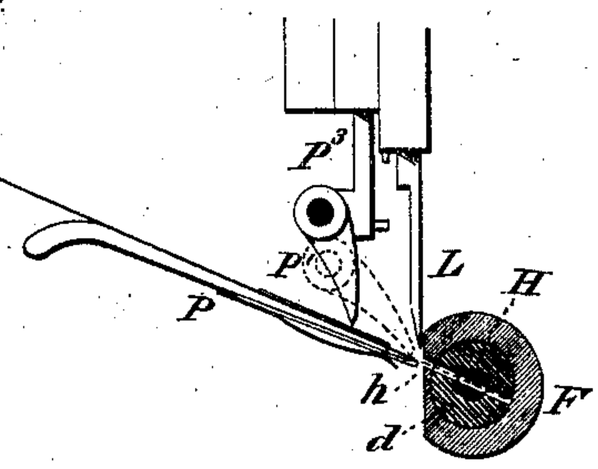


fig. 7

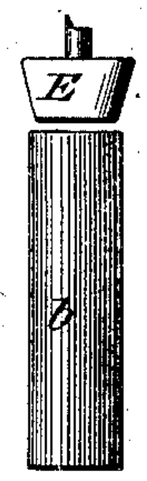


fig. 8

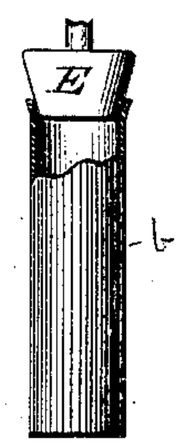


fig. 9

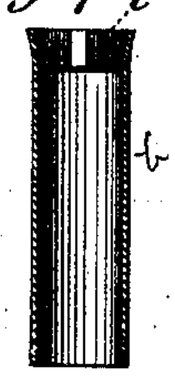
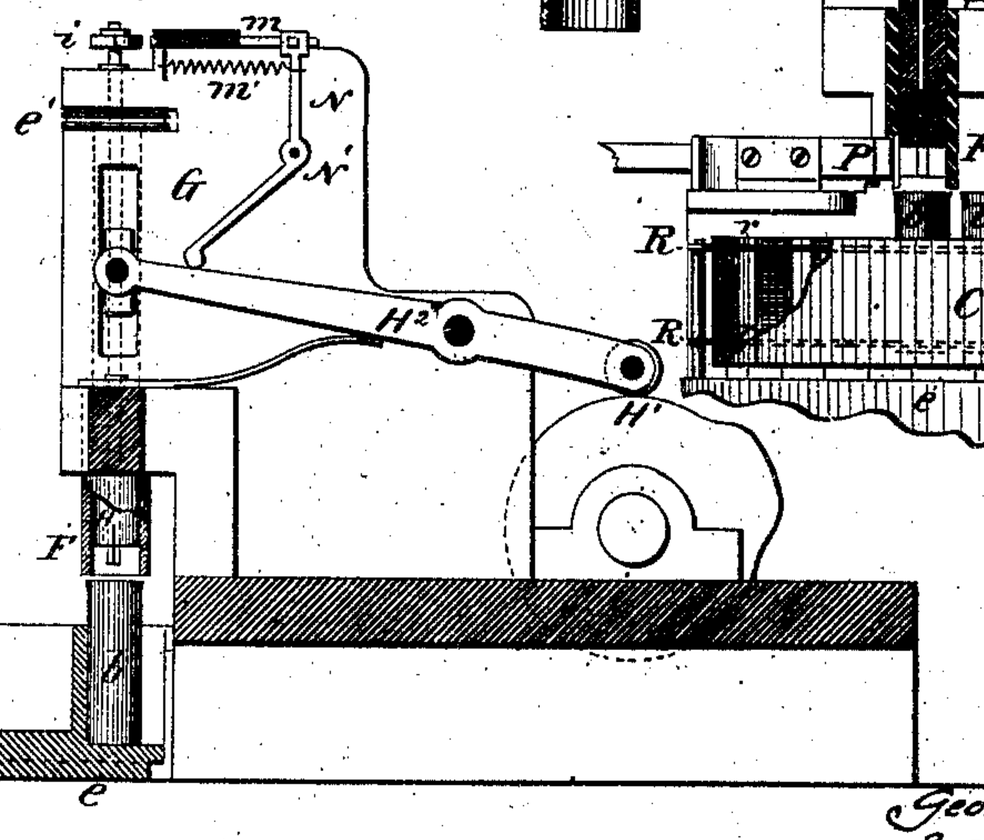


fig. 4

fig. 5



Witnesses.
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UNITED STATES PATENT OFFICE.

GEORGE P. SALISBURY, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO THE WINCHESTER REPEATING ARMS COMPANY, OF SAME PLACE.

PAPER-CARTRIDGE MACHINE.

SPECIFICATION forming part of Letters Patent No. 237,605, dated February 8, 1881.

Application filed November 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. SALISBURY, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Wad-Winding Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings, and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, side view; Fig. 2, front view; Fig. 3, top view: Figs. 4, 5, 6, 7, 8, and 9, detached views, illustrating the operation of the machine.

This invention relates to an improvement in machines for winding and introducing the wad into paper-cartridge shells—that is to say, a wad which is introduced into the head end of the paper shell and to form a part of that end of the shell which is inclosed by a metal cap, the particular class of shells to which it is applicable being commonly called "shot-shells"—that is, shells which are designed for breech-loading shot-guns, the object of this invention being to automatically wind the wad and place it in the shell; and it consists in the construction as hereinafter described and particularly recited in the claims.

A represents the bed of the machine, on which the operative mechanism of the machine is placed; B, the driving-shaft supported and made to revolve in bearings B′ by application of power thereto through pulley B^2 or otherwise.

C is a disk arranged upon the bed so as to be rotated freely thereon in a plane parallel with the plane of the bed—that is, with its axis vertical. Near or at the edge of the plate recesses *a* are made, more or less in number, each prepared to receive a single tube, *b*, into which the wad is to be placed. These tubes are introduced by hand in the usual manner of introducing shells into what is known as "dial-feed" in other cartridge machinery. The recesses *a* open to the outer edge, as seen in Fig. 3. The upper or projecting end of the tube (see Fig. 4) is the head end.

An intermittent rotating movement is imparted to the disk C by a pawl, D, (see Fig. 3,) actuated by a cam, D′, on the driving-shaft to work in a ratchet, *e*, and so as to impart to the disk a movement equal to the distance between the center of one tube and the center of the next, and substantially as in other cartridge-machines. The intermittent movement of the disk successively presents the upper end of each shell to a spreading-punch, E. (See Fig. 4.) To this punch a vertical reciprocating movement is imparted from the cam D, through a rock-shaft, E′, and connecting-lever E^2, which operates upon the vertical spindle E^3, to which the punch E is attached, as seen in Fig. 4. The downward movement of the punch E, as from the position seen in Fig. 7 to that seen in Fig. 8 causes the punch to enter the upper end of the shell and expand it, as seen in Fig. 8. Then rising, the next shell is presented, and so on. The shells thus spread pass on beneath the wad-winding devices. As represented, there are two of these devices. Description of one will be sufficient.

F is a vertical sleeve, extending down from the head G, its internal diameter corresponding in size to the wad to be wound. Through the sleeve is a follower, H, movable vertically within the sleeve—seen in vertical section in Fig. 4, and transverse section enlarged, Fig. 6. The follower H has an intermittent vertical reciprocating movement imparted to it by a cam, H′, on the driving-shaft, through a lever, H^2. (See Fig. 5.) When in its normal condition the follower stands above the lower open end of the sleeve. Vertically through the follower H is a spindle, *d*, extending down to near the lower open end of the sleeve, and above into a suitable support, *d′*. A rapid revolution is imparted to this spindle through a pulley, *e′*.

At the side of the machine a table, I, is arranged, on which the paper from which the wad is to be made, is placed. This paper is cut in a long strip, wound, and laid upon the table, as seen in Fig. 3. The table is provided with a rim to retain the paper thereon, and with a slot, *f*, through which the paper passes to the wad-winder. The spindle *d* has a vertical slot in its lower end into which the end of the paper is introduced, so that when the spindle revolves, it engages the end of the strip and causes the paper to be wound onto

the spindle within the sleeve F and below the follower H, until the wad has acquired the full diameter of the interior of the sleeve F. Then the spindle ceases to revolve, because the friction between the paper and the sleeve becomes greater than the power applied to cause the spindle to revolve. The application of power to the spindle is made, preferably, by a band which will slip on the pulley e' when the sleeve has been filled by the winding of the paper, as before mentione .. When the requisite quantity of paper has thus been wound to form the wad, a cutter, L, (see Fig. 6,) is advanced by the action of a cam, L′, and cuts the strip. The wad thus formed is forced down into the open end of the shell by the downward movement of the follower H, produced as before mentioned. *l*, Fig. 9, represents the wad thus introduced. Then a second shell is presented for the next wad, and so on, continuing to introduce a wad into each shell as it is presented. To automatically introduce the end of the paper to the spindle it passes through a guide, P, (see Fig. 6,) and upon the paper in the guide a feeding-finger, P′, works, operated by a cam, P^2. This finger bears upon the paper, and as the rod P^3, to which it is connected, advances, as seen in broken lines, Fig. 6, it forces the end of the paper into the slot in the spindle *d*, the paper guided through a slot, *h*, in the follower, as seen in Fig. 6, the time at which the finger operates being when the follower is down, and immediately after having forced the previously-wound wad from the sleeve F. This enables the use of a continual strip of the material, the cutter L operating to cut off the strip when the wad has been wound to the proper density.

Independent strips, or strips cut to a given length, may be introduced, but the automatic feed and cutting is preferred because it permits variations in the thickness of the paper without affecting the density of the wad, as the wad is wound to a given density irrespective to the thickness of the paper, owing to the fact that the winding continues until the sleeve is filled, as before described.

It will be apparent that in thus winding the wad the spindle *d* is liable to stop at any point within its revolution, and which might not present the slot in the proper position to receive the end of the strip of paper, and further, the spindle must be held stationary while the end of the strip is being introduced. For this purpose an automatic stop is applied consisting of a disk, *i*, on the upper end of the spindles, each having a shoulder, *n*, and in line with the disk *i* is a slide, *m*, (see Fig. 5,) which is actuated by a lever, N, hung to the head or frame G on a pivot, N′, one arm of the lever attached to the slide *m*, the other bearing upon the lever H^2, which operates the follower H, and so that after the wad has been wound and the spindle therefore standing still, the follower forced down, the lever H^2 passes away from the lever N, permitting it to fall and the slide *m* to be drawn forward by the action of the spring *m′* into line with the shoulder *n* on the disk I, and so that the shoulder on the disk will strike the slide *m* and arrest the revolution of the spindle, (as seen at the right, Fig. 3,) and this arrest occurs when the slot in the spindle is in the position seen in Fig. 6 to receive the end of the strip of paper. Then when the follower rises the lever H^2 will force the slide *m* away from and out of connection with the disk *i* and permit the spindle to revolve and wind a wad.

As before stated, two wad-winders, such as described, are shown in the drawings, arranged distant from each other corresponding to the distance between the first and third or alternate shells in the disk. One of the winders is arranged to make a wad while the other is introducing the one which it has made, and the feed is such—that is, one shell at a step—that one wad-winder introduces its wad, say to the first, third, fifth, and so on, while the other introduces its wad to the second, fourth, sixth, and so on; yet a single wad-winding device may be employed, the movement of the disk being made accordingly. After the wad has been introduced to the tube the rotation of the disk carries the tubes along until they reach an ejector, R. This consists of a pair of fingers extending into annular grooves, *r*, in the edge of the disk, (see Fig. 4,) the figures inclined, as seen in Fig. 3, so as to extend into the inside of the recesses and so that as the tubes advance onto the fingers they are forced radially outward, as seen in broken lines, Fig. 3, and delivered from the machine. The operator may, however, take the tubes out by hand, or they may be otherwise delivered from the machine.

In some cases it is desirable to make the wads without introducing them into the shells. In such case the disk C is dispensed with; and, further, in such case the wad may be wound independent of the sleeve, the diameter of the wad being determined by the length of the paper or by other devices which shall cause the winding to cease when the requisite diameter is attained, and, in that case, instead of moving the follower to eject the wad from the spindle, the spindle may be withdrawn.

In case of using strips of the required length for each wad the cutting device is dispensed with.

The spreading of the end of the tube is not essential, as the wad may be slightly smaller than the end of the tube, and when introduced into the tube it will expand, by the natural unwinding of the paper, sufficient to retain its place in the tube until the subsequent operations are performed.

The disks *i* are represented as constructed with a shoulder upon opposite sides, making two points for automatically stopping, either of which will properly present the slot in the spindle to receive the end of the paper.

It will be understood that whereas the spindle stops whenever the wad is wound to the required density irrespective of the position of the slot, yet the instant the wad is forced from the spindle by the descent of the follower the spindle is revolved until the shoulder on the disk *i* strikes the slide *m*, which stops the spindle in the proper position to receive the end of the strip. This stop may be made in the form of a clutch and disengage the power from the spinde; but the shouldered disk is preferred.

I claim—

1. The combination of two wad-winding mechanisms, substantially such as described, with feeding devices, substantially such as described, to present alternate tubes to the said wad-winding mechanism—that is to say, the first, third, fifth, &c., to one winding mechanism; the second, fourth, sixth, &c., to the other—and a follower in each wad-winding mechanism to force the wad into the shell presented by said feed, substantially as described.

2. In a wad-winder, the combination of the revolving spindle, constructed to engage the end of the strip from which the wad is to be wound, a stop to arrest the revolution of the spindle in position to receive the end of the strip, a feeding device to force the end of the strip into engagement with the spindle, and a cutter, operating to cut off the strip when the requisite length has been taken by the revolving spindle, substantially as described.

3. In a wad-winder, the combination of a revolving spindle, constructed to engage the end of the strip from which the wad is to be wound, a sleeve around said spindle and within which the wad is wound, a stop to arrest the spindle when in position to receive the end of the strip from which the wad is to be wound, a feed to present the end of the strip for engagement with the spindle, and a follower within said sleeve to eject the completely-wound wad, substantially as described.

4. In a wad-winder, the combination of a revolving spindle, constructed to engage the end of the strip from which the wad is to be wound, a sleeve around said spindle and within which the wad is wound, a stop to arrest the spindle when in position to receive the end of the strip from which the wad is to be wound, a feed to present the end of the strip for engagement with the spindle, a follower within said sleeve to eject the completely-wound wad, with a cutter operating to cut off the strip when the requisite length has been wound, substantially as described.

5. The combination of a wad-winding mechanism in which the winding-spindle is constructed to engage the end of the strip from which the wad is to be wound, with feeding devices, substantially such as described, to present the cartridge-tubes into axial line with the said winding-spindle, and a follower to force the wad from the spindle into the tubes, substantially as described.

6. The combination of a wad-winder, substantially as described, with feeding device, substantially such as described, to successively present the cartridge-tubes to the wad-winder to receive the wad, with a device, substantially such as described, to expand the end of the tube to receive the wad, and a follower to force the wad from the spindle into the tube, substantially as described

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