(No Model.) 5 Sheets—Sheet 1.

B. W. TOMLINSON & A. BALCH.

NEWSPAPER WRAPPING, ADDRESSING AND SORTING MACHINE.

No. 272,355. Patented Feb. 13, 1883.

Fig. 1.

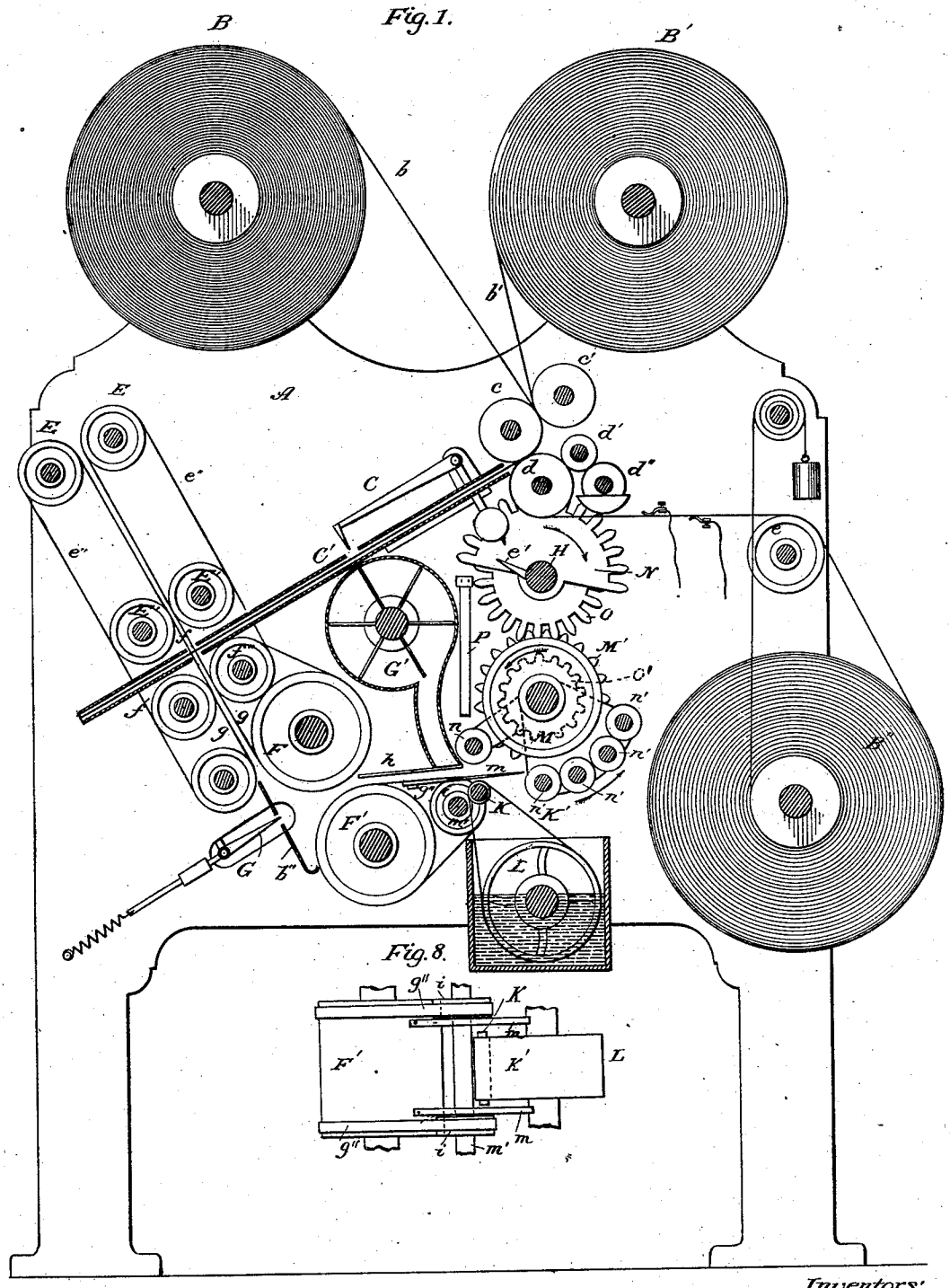


Fig. 8.

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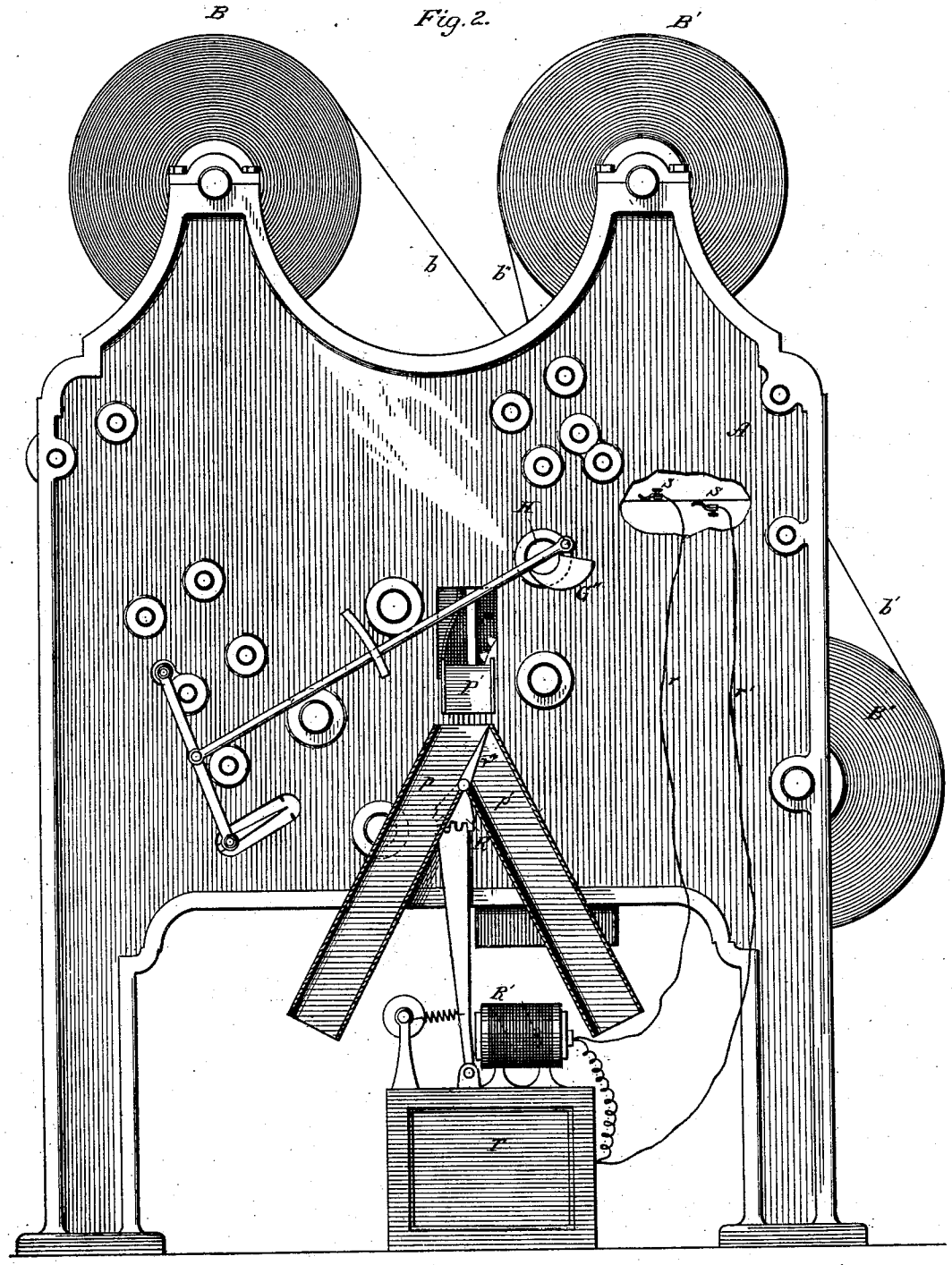
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Fig. 2.



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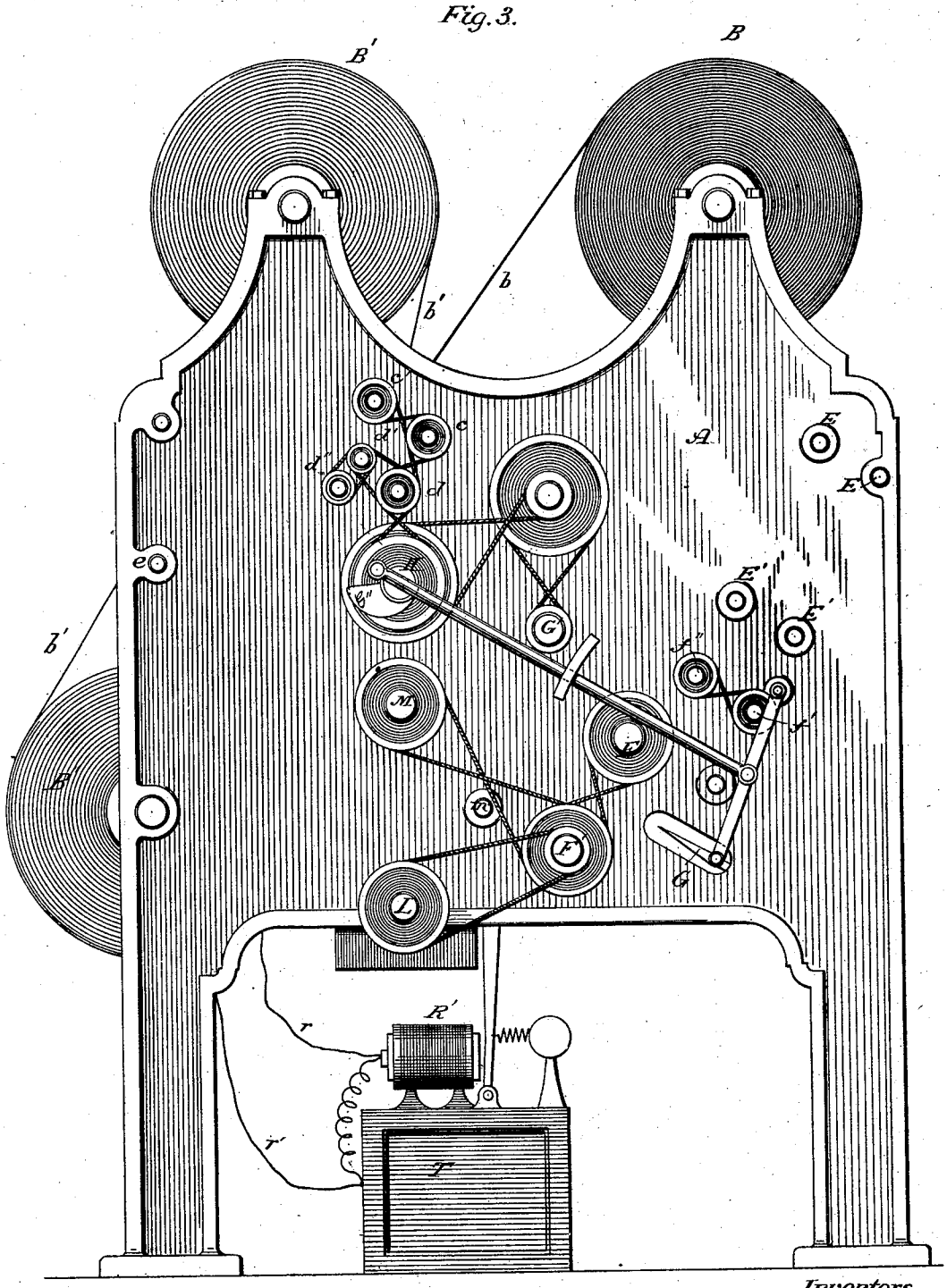
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NEWSPAPER WRAPPING, ADDRESSING AND SORTING MACHINE,

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Fig. 3.



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NEWSPAPER WRAPPING, ADDRESSING AND SORTING MACHINE,

No. 272,355. Patented Feb. 13, 1883.

Fig. 4.

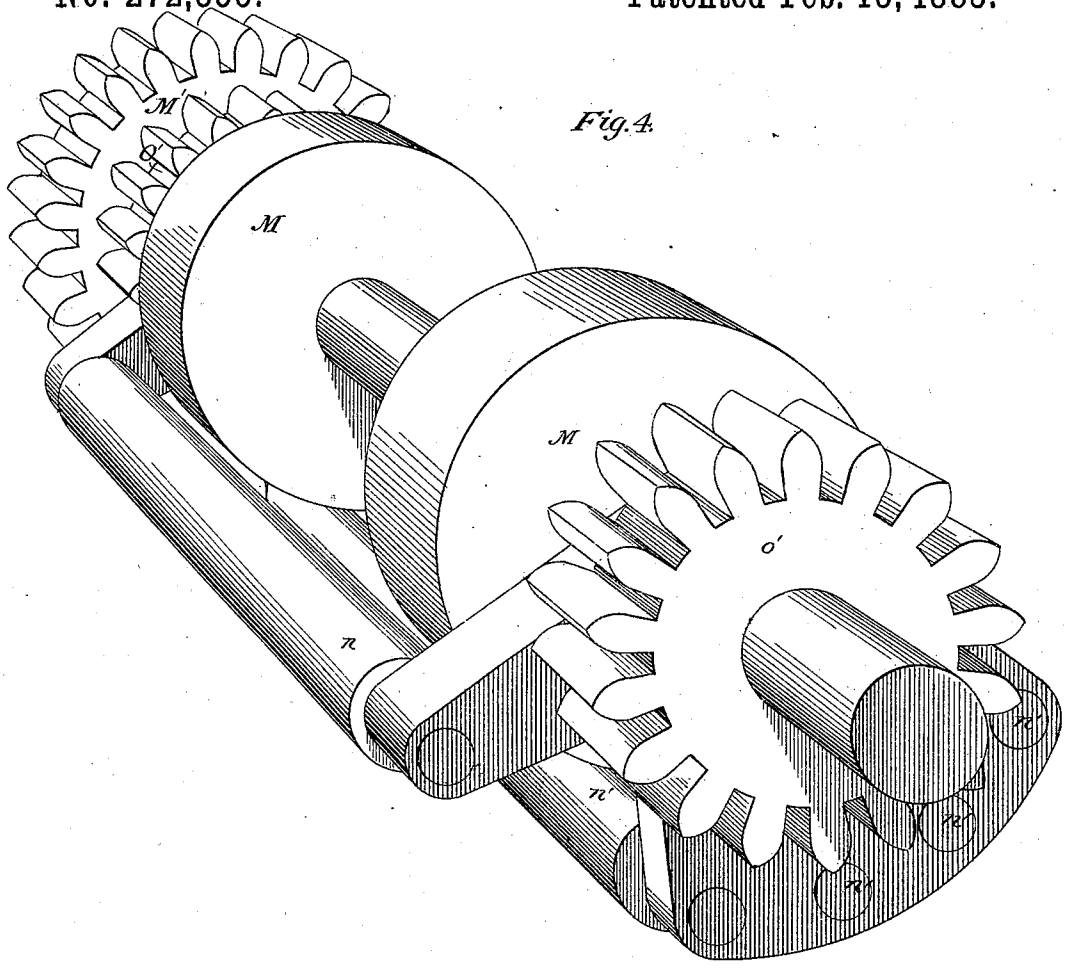
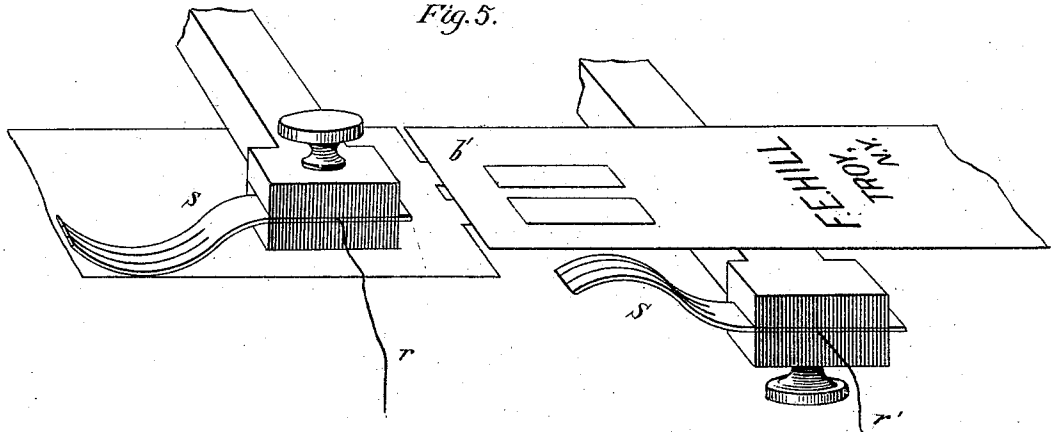


Fig. 5.



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NEWSPAPER WRAPPING, ADDRESSING AND SORTING MACHINE,

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Fig. 7.

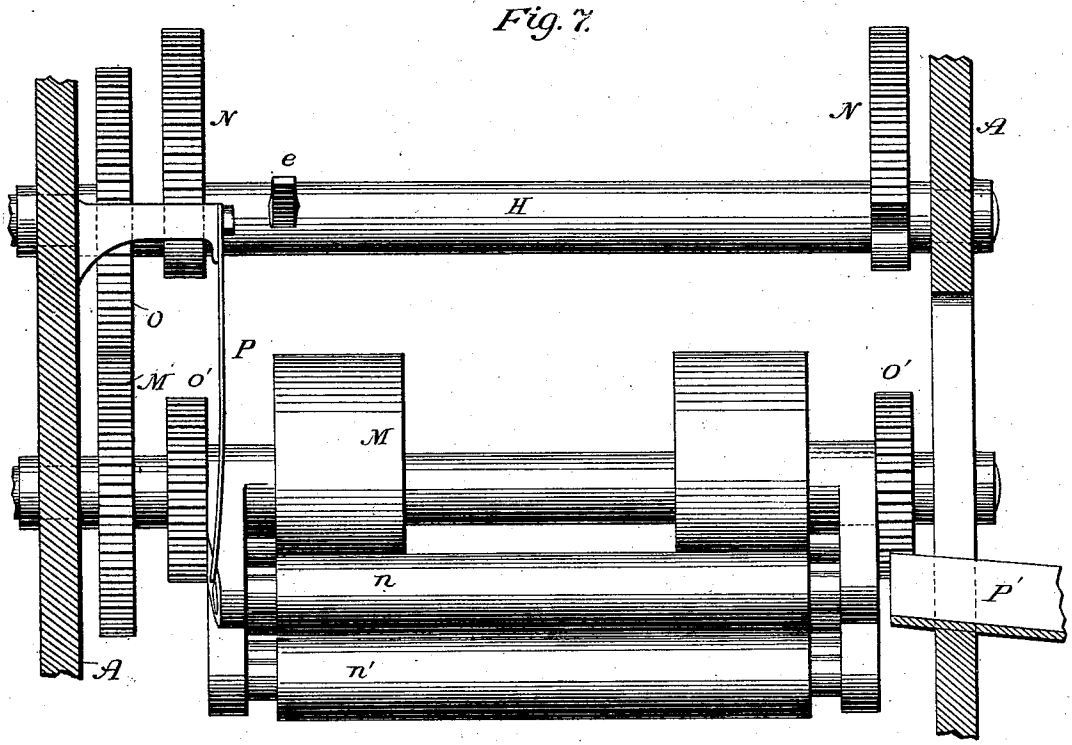
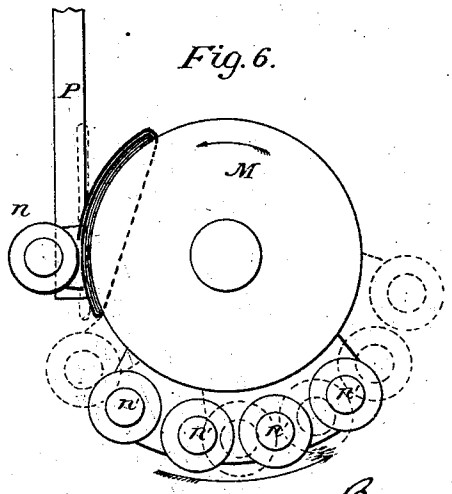


Fig. 6.



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UNITED STATES PATENT OFFICE.

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NEWSPAPER WRAPPING, ADDRESSING AND SORTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,355, dated February 13, 1883.

Application filed January 20, 1882. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN W. TOMLINSON and ALFRED BALCH, citizens of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Newspaper Wrapping, Addressing, and Sorting Machines, of which the following is a specification, reference being had to the drawings accompanying and forming a part thereof.

The invention which forms the subject of our present application relates to machines comprising, in combination, mechanisms for associating newspapers, pamphlets, magazines, or other publications and wrappers, for applying to each its appropriate address, and for delivering them in proper condition for mailing. It is required of such machines that the several mechanisms perform their allotted functions with the greatest possible rapidity, and, since all should co-operate, that their action should be unerringly accurate. These constitute the objects to the attainment of which our present invention is mainly directed, the said invention comprising improvements in the mechanisms for primarily associating the newspapers or other publications and the wrappers, for printing the addresses, and for effecting the inclosure of the papers in the wrappers and delivering them in condition for mailing.

The invention further embraces certain devices of novel character employed in the construction of our apparatus, the nature of which will be fully hereinafter set forth.

In the accompanying drawings, Figure 1 is a vertical section of the apparatus involving the subject-matter of our invention, the section being through the device, close to one of its sides; Fig. 2, a side elevation of the exterior of the supporting-frame, exhibiting also the sorting and delivering mechanism. Fig. 3 is a similar view of the opposite side of the apparatus, with an illustration of the means for imparting motion to the several parts; Fig. 4, a view in perspective of the mechanism for securing the wrappers; Fig. 5, a perspective of a portion of the devices employed for printing the addresses and effecting the sorting of the publications as they are delivered. Fig. 6 is a view in elevation of the devices shown in Fig. 4, the plan of mounting the said devices being here shown; Fig. 7, a diagrammatic illustration of the nature and principle of operation of the same, and Fig. 8 a plan view of a detail of mechanism.

The apparatus is designed to be used as an auxiliary to any of the ordinary folding-machines from which the publications are delivered folded in shape to be inclosed in wrappers for mailing, and we would here state that as the character of such machines does not enter into a consideration of the present invention, except in as far as provision must be made for the delivery of the publications from the folding-machine to the wrapping and delivery apparatus just before they have received their last fold; they are neither shown nor specifically described. It will be readily understood, however, that the wrapping apparatus will be constructed with respect to the devices for receiving the folded publications from the folding-machine to meet the requirements of particular cases, no substantial variation from the construction herein described being necessary.

The apparatus which we have designed is to be supported by a suitable frame-work, and its moving parts to receive motion from a main shaft by a system of gearing arranged to impart to the machine motion that renders its action continuous and rapid. Referring to Fig. 1, A represents such a frame, and B B′ two reels suitably mounted thereon, one, as B, containing a continuous web of wrapping-paper, *b*, the other a continuous system of stencils linked or otherwise connected together—as, for instance, as is illustrated in Fig. 4, where tongues in one plate registering with slots in the next are employed as the means of connection. The web *b* and stencils *b′* are to be drawn off from the reels simultaneously, and brought together by two carrier-rolls, *c c′*. These rollers are arranged to unwind from the reel B at each revolution of the main shaft enough paper to form one wrapper, and from the reel B′ an equal length of stencil-plate, the addresses on which are to be at such definite distances apart that each of such lengths will

contain one address in proper relative position to the wrapper to which it is to be imparted. The web *b* and band *b'* are passed, after leaving roller *c'*, between roller *c* and an inking-roller, *d*. This latter receives its ink from a distributing-roller, *d'*, and an ink-supply roller, *d''*, or otherwise, as may be most desirable, and imparts to the web *b*, through the stencils, the appropriate addresses. The band of stencil *b'* is then to be carried around the roller *d* and over a loose roller, *e*, to reel B'', upon which it is wound by any means, a cord and weight being convenient for the purpose. The web *b*, after leaving the rolls *c d*, passes down the chute or slide C', and is cut in proper lengths by mechanism actuated by the main shaft—such as a knife connected to a weighted lever, as C, arranged to be struck by a pin, *e'*, on the shaft H—or by other cutting or tearing mechanism, such as is commonly employed for this purpose.

The publications to be wrapped are delivered in rapid succession from the folding-machine just before receiving their last fold, and at such intervals of time that they will encounter the wrappers at the proper moment. Assuming that newspapers are the publications to be folded and wrapped, each one is received from the folder by the rollers E E, between which it passes, and is carried by the tapes *e'' e''* to the rollers E' E', by means of which it is forced through a slot, *f*, in the slide C', carrying with it the length of wrapper which it encounters in its passage. It is thus inclosed by a wrapper on two sides, and as it is caused to encounter the wrapper at a predetermined distance from the middle a flap of the wrapper will be left projecting beyond the upper edge of the paper and on the side next to the cutting-blade, as shown. The paper thus inclosed is caught by rollers *f' f''*, by means of which and the tapes *g* it is brought down, opposite the pressing or folding rolls F F', on the slide or chute *b''*. Upon reaching this position it is doubled by a blade, G, actuated by a cam, G'', on the shaft H, (shown in Fig. 2,) and forced between the folding-rolls F F'. At this point the paper will have received its last fold, and is entirely inclosed by the wrapper, the flap of which still projects from the top and to the rear of the folded package. From rollers F F' the paper is carried forward by tapes *g''* and guide-rods *h* or other tapes to a pair of disks, *i*, mounted at suitable distances apart on a shaft, *m'*, and by these forced out upon the spring-arms *m*.

K is a small roller arranged in bearings between the disks *i i* and close to the shaft *m'*. It is revolved at a comparatively slow rate of speed by means of a band, K', passing over a wheel, L, that revolves in a paste-reservoir.

G' is a fan-wheel revolved by the main shaft and arranged to direct a continuous blast of air against the wheel K. By this arrangement of the devices, when the newspaper, with the wrapper upon its two sides and in between the last fold, passes over the roller K, the air-blast forces the projecting flap of the wrapper against the paste-band K' and charges it with paste. This is the more surely accomplished on account of the forward movement of the paper at the time that the flap of the wrapper is forced in contact with the pasting-surface. By the springs *m* the paper is guided to a cylinder, M, preferably corrugated, and which revolves in the direction shown by the arrows, so that the paper is drawn in between the cylinder and the rollers *n' n'*, which are at this moment stationary. The cylinder M, as shown in Figs. 4 and 7, has a section cut out from its center of slightly greater length than the width of the wrapper. The purpose of this configuration is to bend or curve the paper previous to the operation of receiving the flap of the wrapper, so that the latter will be tightened and prevent the possibility of the two being separated. This will be understood by observing the manner in which these devices operate. The folded newspaper, in passing between the cylinder M and rollers *n'*, is made to conform to the curved surface of the former. That portion of the wrapper, however, that lies between the paper and the cylinder will not be confined to this shape, on account of the space afforded by the removal of the section, but will remain straight, so that when the flap is brought over and secured, as will be further explained, the effect will be to tighten the wrapper around the paper, when the latter is finally released from the apparatus.

The cylinder M is revolved from the main shaft H by a gear-wheel, M', of equal diameter with gear-wheel O, with which it meshes. The system of rollers *n n'* are journaled in suitable arms projecting from collars on the shaft of cylinder M, about which they are concentrically rotated through the instrumentality of segmental gears N on the main shaft H and gear-wheels O' on the said collars. The gears N are segments of wheels of twice the diameter of the gear-wheels O', so that for each revolution of the said segments the rollers *n n'* make one revolution about the cylinder M, running at double its speed. The segments N are fixed to main shaft H in such position as to engage gears O' at the moment when the newspaper is completely within the space between the cylinder M and the rollers *n'*. As a result, the paper is carried around the cylinder; but as the rollers are moving with twice the velocity of the surface of the cylinder the free end of the wrapper is overtaken by the roller *n*, and the flap is laid over and pressed against the opposite side of the package, to which the paste causes it to adhere. After this operation the paper is freed from the action of the system of rollers, and is to be discharged from the apparatus. A convenient means of effecting this step is by the employment of a spring-blade, P. (Represented in Figs. 1, 6, and 7.) The spring P is

secured in proper manner to the frame or a projection therefrom, and is so placed relatively to the cylinder M that it will be forced back by the bearings of the systems of rollers *n n'* in the course of their movement around the cylinder M. When the said rollers have passed the folded paper the spring P is released, and its resilience causes it to strike the paper and drive it out through a suitable opening in the side of the frame (shown in Fig. 2) and into a chute, P'. From this it is delivered by its own weight through one or the other branch of a delivery-tube, *p p'*, according to the position of the switch *r*. The purpose of this is to sort the papers according to their post-office address, and the mechanism which we employ for controlling the action of the switch is as follows: The switch is shifted by means of the segment R or its mechanical equivalent, which is arranged to be drawn to one side by an electro-magnet, R', and to the other by a spring or weight. The magnet R' is in circuit with a battery contained within a case, T, or with other sources of current, as may be deemed preferable. The circuit is opened or closed at the proper times by the machine itself, and we desire to state that the means for accomplishing this may be varied to a great extent without departure from our invention. The method adopted by us is to effect the requisite makes and breaks by means of the continuous band of stencils, and for this purpose the individual plates composing said band are made of different widths, and contact-strips S S are employed in conjunction therewith, the said strips being so placed that the wider stencils may come in contact with both, while the narrower stencils pass by them without touching either. This is illustrated in Fig. 5, where a division between two plates of different width is shown, and the contact-springs S S, held by any suitable supporting-arms, illustrated in their proper relative position. Wires *r r'* connect the springs S S with the magnet and the battery, so that when a broad stencil is bearing on both springs the magnet is energized and draws its armature—in this case the segment R—over toward itself, thus setting the switch r^2. It will be seen that by this arrangement, if all the stencils bearing addresses for one post-office be made of the same width and connected together, the switch r^2 will remain in the same position while the papers or other publications intended for that post-office are passing through the delivery-chute and one side of the bifurcated tubes *p p'*, and that when the address is to be changed, if the stencil-plates be changed to the other width, the switch is shifted and deflects the papers into the other side of the bifurcated tube. By this means the papers are sorted without manual labor, and their delivery by mail greatly facilitated.

The carrying-tapes employed by us in the construction of the above-described apparatus are metallic bands, copper, brass, or equivalent metal being employed, and they are roughened on the side that comes in contact with the papers or other publications which they are designed to transfer, or on both sides, if so desired. Such tapes, being very durable and little liable to break, are a great improvement on the cotton or other tapes usually employed.

In the practical operation of this apparatus the requisite motion may be transmitted from one or more shafts to the various parts in a number of well-understood and simple ways. As an illustration of the principle of this transmission, cords or bands are illustrated in Fig. 3 as the means to be used outside of the machine, the remaining connections being within the sides of the frame and illustrated in previous figures. The design of Fig. 6 is to illustrate the conditions of the apparatus at two points of time. The full lines designate the rollers *n n'* in position when they have just completed the fold of the flap, and the broken lines represent the same at the moment when they have left the paper free, and when it is being discharged by the spring P.

The above description has been confined to a machine arranged with special reference to the wrapping of newspapers. It is, however, obvious that without alteration, or with such changes as in no wise affect the functional character of the devices employed, the same may be adapted to wrapping, addressing, and delivering pamphlets, magazines, or other similar publications as well as newspapers.

As an entirety, the apparatus constitutes a complete and valuable adjunct to the printing and folding machines now employed. It may, however, be stated that many alterations in the character of the several elements composing the machine may be made—as, for instance, in respect to the addressing mechanism, other of the known forms may be employed; or it may be dispensed with entirely, and the addresses printed on the web of wrapping-paper before the same is delivered to the apparatus.

We are aware that a folding and wrapping apparatus for similar purposes to those for which portions of the above described machine are designed is not broadly new. Our invention is distinguished from such by the character of the mechanisms employed, by the relative disposition of the elements composing the apparatus as an entirety, and by the introduction of novel devices, not exhibited, so far as we are aware, in any machines hitherto existing.

We would state that the carrier-tapes described are not claimed specifically herein, as we intend making separate application therefor.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for automatically wrapping newspapers and similar publications, consisting of the following instrumentalities, to wit: mechanism for holding and feeding a wrapper-

web, mechanism for associating with sections of the same partially-folded publications, and intermediate mechanism for dividing the web into sections before the association therewith of the publications, a folding mechanism, a pasting mechanism, and a pressing mechanism, these devices being constructed and combined for co-operative action, substantially in the manner hereinbefore set forth.

2. An apparatus for automatically wrapping newspapers and similar publications, consisting of the following instrumentalities, to wit: a wrapper-web holder, mechanism for imparting at intervals addresses upon the web, mechanism for associating with sections of the web partially-folded publications, and intermediate mechanism for dividing the web into sections of given length before the association therewith of the publications, a folding mechanism, a pasting mechanism, and a pressing mechanism, these devices being constructed and combined for co-operative action, substantially as hereinbefore set forth.

3. An automatic apparatus comprising the following instrumentalities, to wit: a mechanism for feeding a wrapper-web, mechanism for dividing the same into sections, mechanism for associating with such section a partially-folded publication, mechanism for completing the folding of the said publication, devices for securing the wrappers on the same, a delivery mechanism, and a sorting mechanism, these devices being constructed and combined for co-operative action, substantially in the manner and for the purpose set forth.

4. The combination, in an apparatus for sealing newspapers and other publications in wrappers, of a pasting-surface, mechanism for creating a current or blast of air toward the same, and mechanism for bringing portions of the wrappers in proximity to the pasting-surface and under the influence of the air-blast, whereby they may be forced in contact with the pasting-surface and receive a charge of paste, all substantially as described.

5. The combination, with a folding and wrapping apparatus, of a sorting mechanism consisting of a divided chute or trough, with a switch for deflecting the products of the said apparatus into one or other of the said divisions, substantially as and for the purpose set forth.

6. The combination, with a folding and wrapping apparatus, of a bifurcated sorting chute or tube, a switch for deflecting the products of said apparatus into one or the other of the divisions of the chute, and an electro-magnet controlling said switch, and included in a circuit opened and closed at proper intervals by a moving portion of the apparatus, substantially as set forth.

7. The combination, in an apparatus of the kind described, with the electro-magnetic sorting mechanism and a circuit connected therewith, of a continuous band of stencils of unequal widths, and contact strips or terminals disposed in such relation therewith that a metallic connection may be established between the terminals by the wider strips only, substantially in the manner described.

8. In an apparatus of the kind described, the combination, with the devices for inclosing newspapers or other folded publications in wrappers, and applying to the latter a line of paste, of mechanism for imparting to the said papers and to the wrappers, with the exception of the outer lap, a bent or curved shape in a direction at right angles to the length of the wrapper, and devices operating to fold over and secure the outer laps upon the wrapped package while bent, substantially as and for the purpose set forth.

9. The folding and pressing mechanism consisting of a rotating cylinder, recessed as described, in combination with a system of carrier-rollers and a folding and pressing roller, the said rollers being capable of intermittent rotation around the cylinder at a higher speed than that of the cylinder, substantially in the manner set forth.

10. The combination, with the cylinder M and the system of rollers operating in conjunction therewith, of a spring, P, arranged in the path of the bearings of the rollers, and adapted to be actuated thereby for the purpose of forcing the sealed publications from the surface of cylinder M.

11. The combination of rollers F′ *i i* and tapes connected therewith, of guide-springs *m*, roller K, band K′, passing through a paste-reservoir, and an air-blast apparatus, G′, substantially as described.

In testimony whereof we have hereunto set our hands this 7th day of January, 1882.

BENJAMIN W. TOMLINSON.
ALFRED BALCH.

Witnesses:
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