Aug. 16, 1932. B. R. WILLIAMSON 1,871,765

MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

Filed Aug. 16, 1928 5 Sheets-Sheet 1

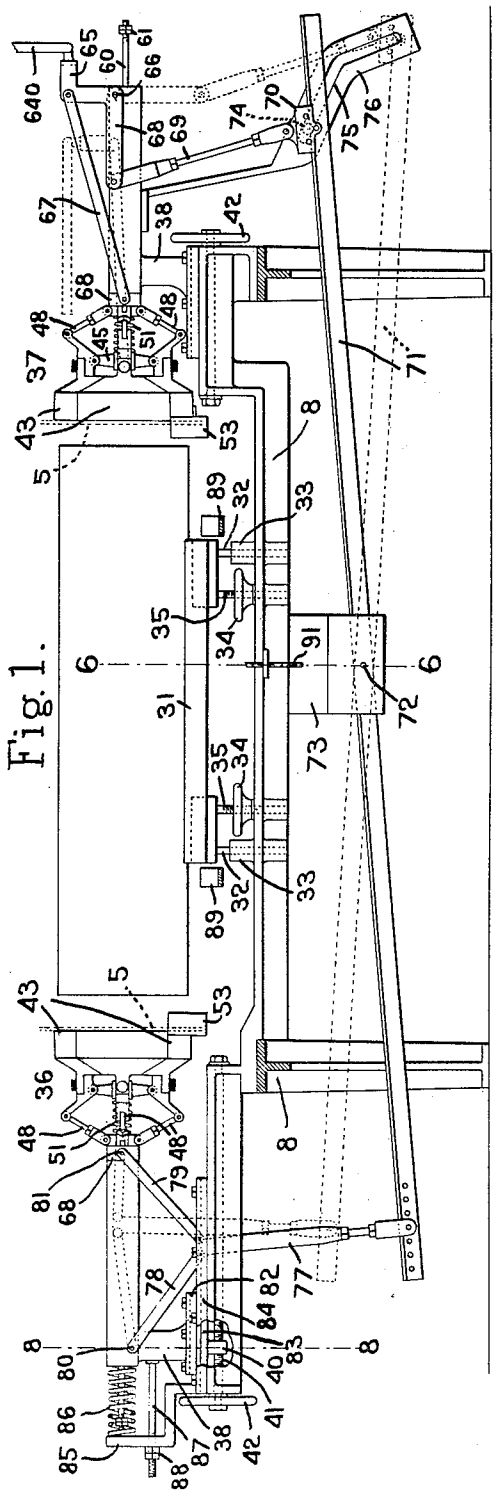


Fig. 1.

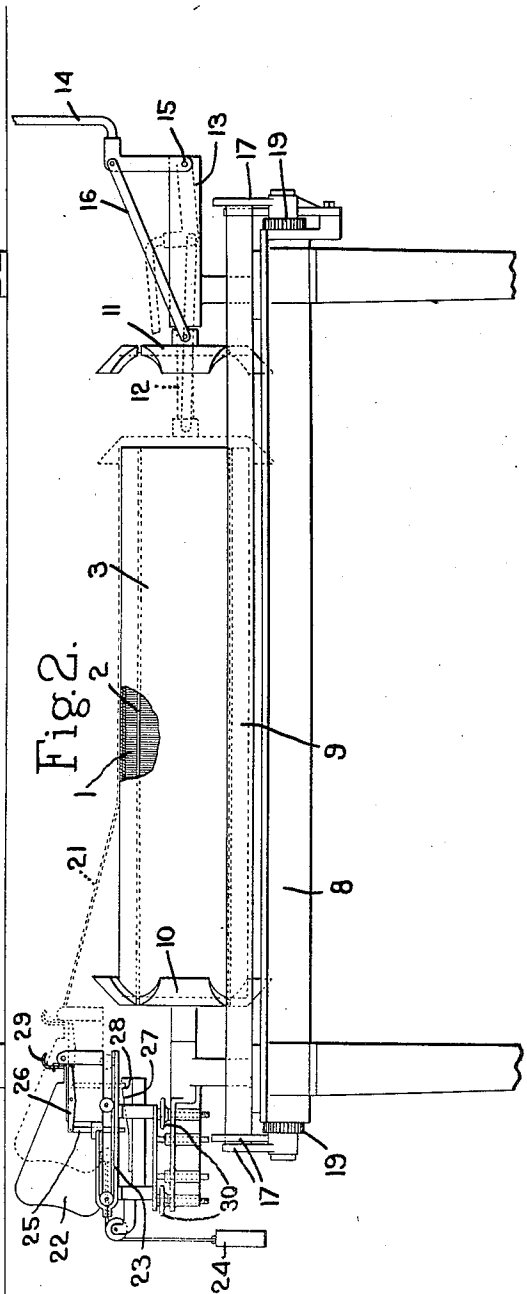


Fig. 2.

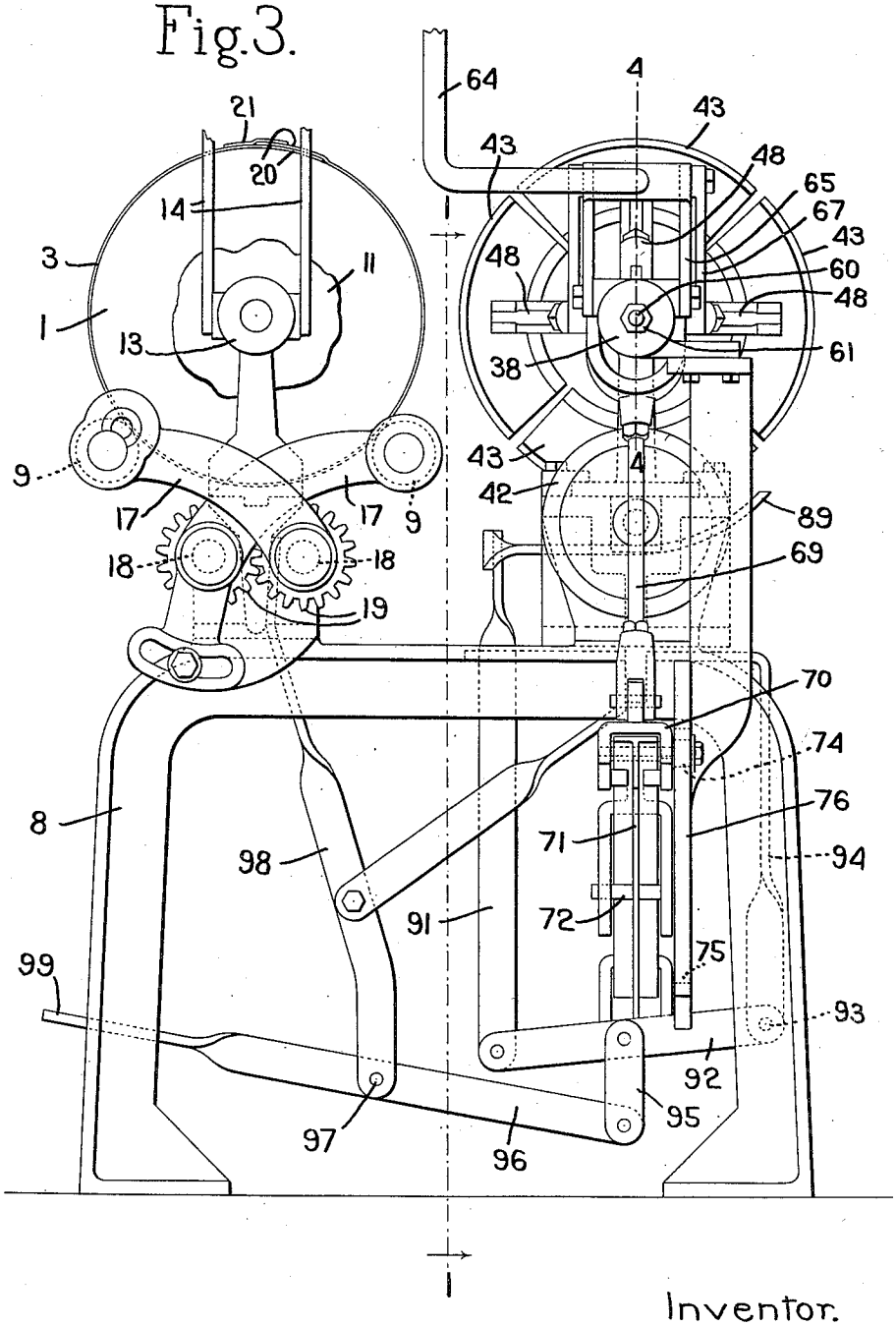
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MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

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Fig.3.



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MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

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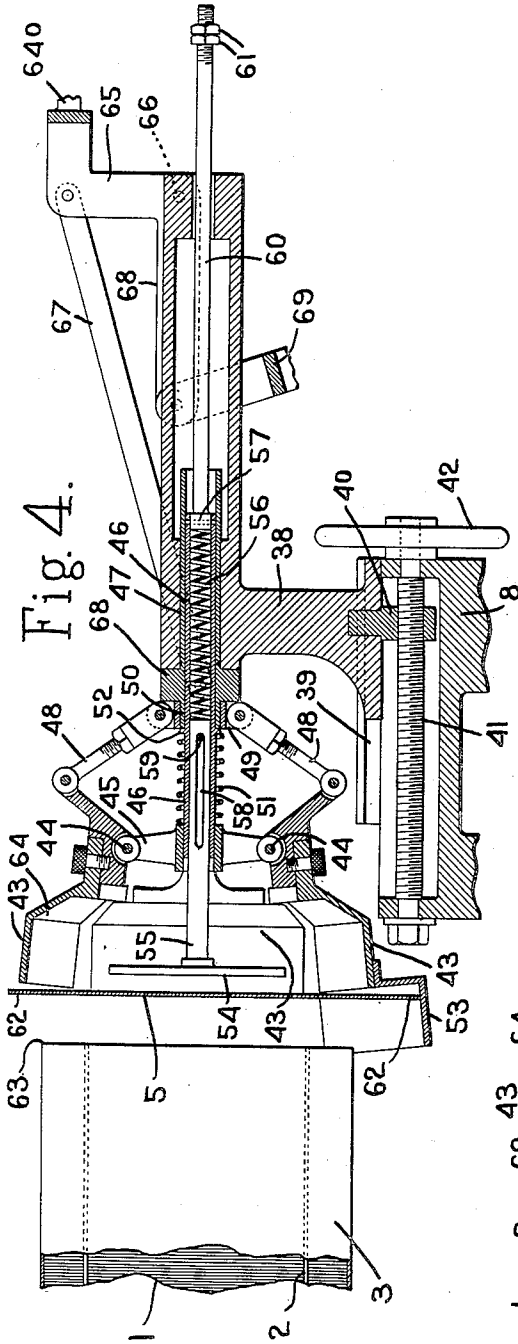


Fig. 4.

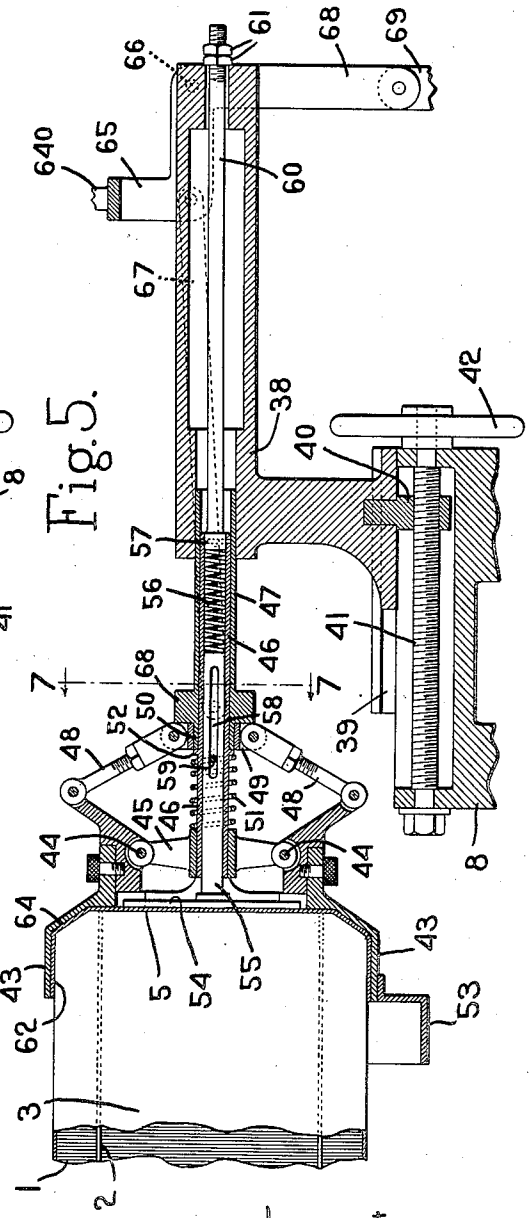


Fig. 5.

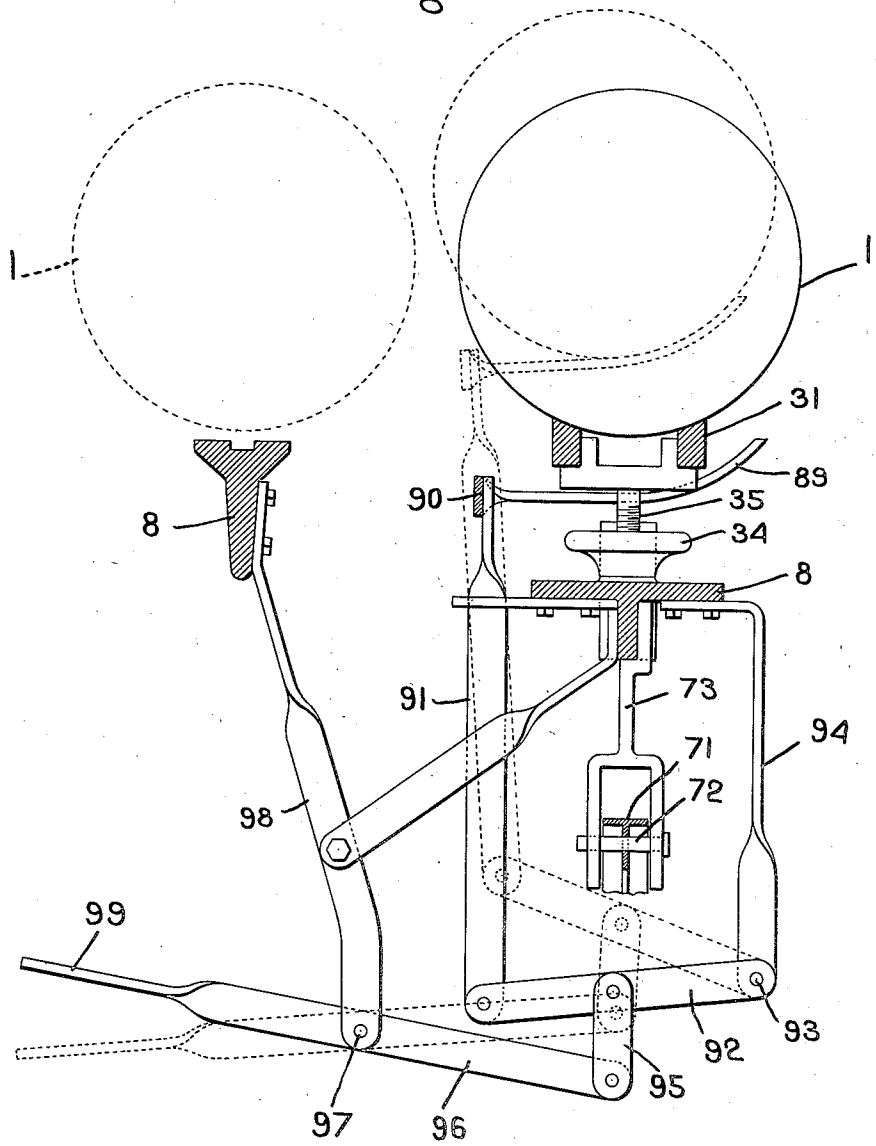
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MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

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Fig. 6.



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MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

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Fig. 7.

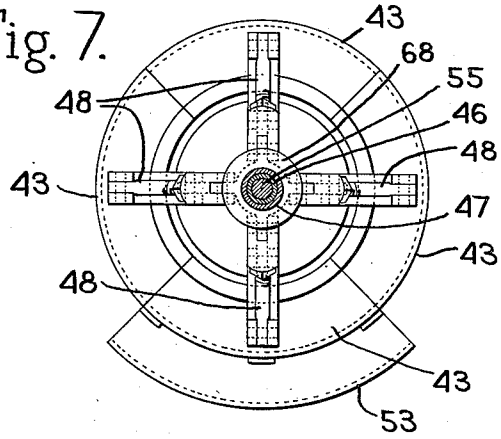


Fig. 8.

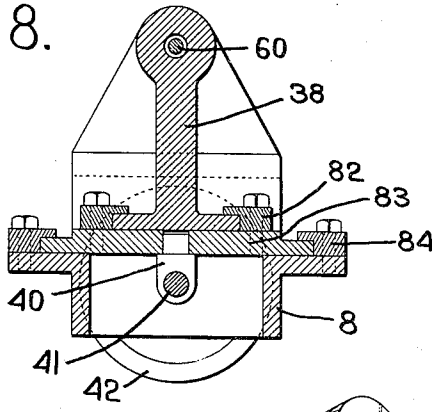


Fig. 9.

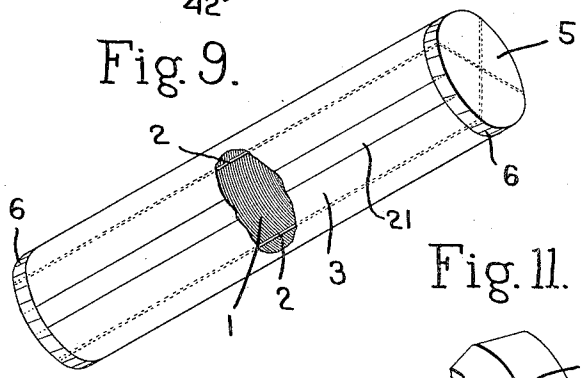


Fig. 11.

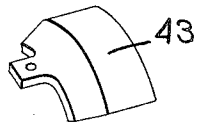
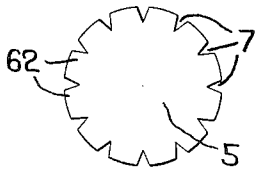


Fig. 10.



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Patented Aug. 16, 1932

1,871,765

UNITED STATES PATENT OFFICE

BERT R. WILLIAMSON, OF WATERVILLE, MAINE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FIDELITY TRUST COMPANY, OF PORTLAND, MAINE, A CORPORATION OF MAINE, TRUSTEE

MACHINE FOR PACKAGING PIE PLATES AND SIMILAR ARTICLES

Application filed August 16, 1928. Serial No. 299,950.

This invention relates to a machine for bundling and sealing packages and it has been specially designed for use in bundling and sealing packages of paper plates and similar articles.

Some of the features of the machine are similar to the constructions shown in the Keyes Patent No. 921,256, dated May 11th, 1909, and the Williamson Patent No. 1,401,298, dated December 27th, 1921.

These patents show machines for bundling and wrapping a stack of pie plates and said machines are constructed to take a pile or stack of plates and align them and then to compact them into a firm solid roll and to retain them in this condition until the wrapping material has been placed around the roll and binding twine also tied around the roll from one end to the other to retain the roll of plates in their compact condition.

In the operation of these above-mentioned machines the binding twine is tied to the package on the outside of the wrapping paper and the latter does not cover the plates at the end of the bundle, said plates being exposed. As a result these end plates become soiled during the handling of the package and, therefore, have to be discarded.

One of the objects of my present invention is to provide improvements in machines of the type illustrated in said patents by which the package of plates can be bundled and wrapped in such a way that no plates will be exposed in the wrapped bundle.

The machine herein shown is provided with means somewhat similar to the mechanism illustrated in the above-mentioned patents for aligning and compacting a stack of plates, except that the binding twine is tied around the stack of plates before any wrapping paper is applied. After the stack of plates has been compressed and tied then a wrapping paper is placed around the tied bundle and subsequently disks of paper are applied to the ends of the bundle to cover the end plates and the peripheral portions of the disks are folded over against the side walls of the bundle and caused to adhere thereto thereby sealing the ends of the bundle.

The bundle is thus entirely sealed and can be handled freely without danger of any of the plates becoming soiled or injured.

In order to give an understanding of the invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Fig. 1 is a section on a reduced scale on the line 1—1, Fig. 3 showing the mechanism for sealing the ends of the bundle;

Fig. 2 is a front view of the machine illustrating the means for compacting the stack of plates;

Fig. 3 is an end view of Fig. 2 looking toward the left;

Figs. 4 and 5 are sections on the line 4—4, Fig. 3, showing the operation of the folding jaws for sealing the end of the package;

Fig. 6 is an enlarged section on the line 6—6, Fig. 1;

Fig. 7 is a section on the line 7—7, Fig. 5;

Fig. 8 is a section on the line 8—8, Fig. 1;

Fig. 9 is a perspective view showing the sealed bundle;

Fig. 10 is a view illustrating the shape of the disk which is used to seal the end of the bundle;

Fig. 11 is a perspective view of one of the folding jaws.

Before describing the machine I will refer briefly to the sealed bundle which is made on the machine. As stated above this machine has been specially designed for bundling paper or fibre plates, and a stack of plates, say five hundred or so, are placed in alignment to make a roll indicated at 1 in Fig. 9 and this package of plates is then compacted longitudinally and tied with binding twine 2 which extends longitudinally thereof so as to retain the stack of plates in their compacted condition. A wrapping paper or other wrapping material 3 is then wrapped around the tied bundle of plates and if desired the meeting edges of the wrapping material 2 may be secured together by a strip 21 of gummed paper which extends longitudinally of the bundle and overlies the meeting edges of the wrapping material. The

ends of the bundle are then sealed by paper heads or disks such as shown at 5 in Fig. 10. These are applied to the ends of the package over the binding twine 2 and the peripheral portions of the disks are then folded down against the side walls of the package as shown at 6 in Fig. 9. I will preferably make the peripheral portion of these disks with notches 7 as shown in Fig. 10 so as to facilitate this folding operation and the said peripheral portion of the disk will also preferably be provided with a gummed or adhesive surface so that the peripheral portion 6 of the sealing disks will adhere to the walls of the bundle when they are folded against them.

In a bundle thus made the plates 1 are held under compression by the binding twine 2 and the wrapper 3 and the disks 5 completely cover and seal the bundle of plates so that the bundle can be handled freely without danger of soiling any plates.

The machine herein shown comprises a framework or stand 8 on which is mounted mechanism somewhat similar to that shown in the above-mentioned patents and which is adapted to align the stack of plates and compact it endwise while the binding twine is applied and while the wrapping material 3 is applied, and on which is also mounted the mechanism for applying the sealing disks 5 for sealing the ends of the bundle.

The mechanism for compacting the bundle and which is similar to that shown in the above-mentioned patents comprises two supporting bars 9 on which the stack of plates is supported, and two heads 10 and 11 movable relative to each other and adapted to compress the stack of plates lengthwise. The head 10 is shown as fixed in position and the head 11 is carried by a stem 12 which slides in a support 13 carried by the frame 8. The head 11 is given its operative movement from the full to the dotted line position by means of an actuating lever 14 pivoted at 15 to the support 13 and connected to the head 11 by a link 16.

The supporting bars 9 are mounted on arms 17 which are fast on shafts 18 journalled in bearings in the frame 8, said shafts being connected by intermeshing gears 19. This construction is provided so as to permit the supporting bars 9 to be adjusted into a position to properly support the stack of plates with relation to the heads 10 and 11 and it enables the machine to operate equally well on plates of different sizes. This mechanism for compressing the stack or pile of plates is similar to that illustrated in the above-mentioned Patent No. 1,401,298 and hence need not be further described herein.

In the operation of the parts above described the wrapping paper 3 will first be placed on the bars 9 and then the binding twine 2 will be laid on the wrapping paper and laid into grooves formed in the faces of the heads 10 and 11 as described in the above-mentioned patents, after which the required number of plates 1 will be placed in position on the bars 9. The lever 14 is then actuated to move the head 11 forwardly from the full to the dotted line position thereby subjecting the pile of plates to endwise compression and firmly compressing them into a compact bundle. While the plates are still under compression the binding twine 2 will be tied around the bundle to maintain it in its compacted condition and the wrapping paper 3 is then wrapped around the bundle. The wrapping paper 3 may conveniently be of a size so that when it is wrapped around the bundle the edges 20 thereof will overlap as shown in Fig. 3. The strip 21 of gummed paper is then applied to the overlapping edges to maintain them in proper position and to maintain a tight joint.

This sealing strip 21 may be applied in any suitable way. I have herein shown for this purpose a device indicated at 22 such as is in common use in stores and other locations for delivering a strip of gummed paper to be used in sealing bundles. This device 22 is movably mounted on a track 23 and is normally held in its rearward position through the medium of a counterweight 24. When the side seam of the package is to be sealed the magazine device 22 is moved forwardly into the dotted line position, in which position it will be automatically retained by means of a latch 25 that is carried on the end of a lever 26 pivoted to the magazine, the lower end of the latch running up an inclined surface 27 and then dropping into a notch 28.

When the magazine 22 is in the dotted line position the operative pulls off the gummed strip 21 therefrom and applies it to the side seam of the package, it being understood that the device 22 is of the type which moistens the gummed strip as it is withdrawn. The device 22 is provided with the usual cutter which is actuated by a finger piece 29 and this finger piece is arranged so that as it is depressed to operate the cutter it will actuate the lever 26 and thus raise the latch 25 from the notch 28 thus releasing the magazine 22 and allowing it to move backwardly from the full to the dotted line position under the influence of the weight 24.

The track 23 is mounted for vertical adjustment by means of suitable adjusting screws 30 in order to permit the magazine 22 to be given its proper position for different sizes of plates.

After the package of plates has been thus tied and wrapper with the wrapping paper 3 then it is transferred from the supporting bars 9 on which it has been supported up to this time to the end-sealing mechanism which is supported on the frame 8 in the rear of the compacting mechanism above described.

This end-sealing mechanism is shown in Fig. 1 and at the right in Figs. 3 and 6 and also in some detail in Figs. 4, 5 and 7. It comprises a cradle 31 supported on the frame 8 and adapted to receive the bundle of plates while the ends are being sealed, and two heads each adapted to apply a sealing disk 5 to one end of the bundle and to fold the peripheral portion of the sealing disk over against the side wall of the bundle.

The cradle 31 is preferably mounted for vertical adjustment so that it can be placed in position to accommodate plates of different sizes. This cradle is shown as having guiding pins 32 depending therefrom which are guided in openings formed in bosses 33 carried by the frame 8 and the vertical adjustment is secured through adjusting nuts 34 which engage the frame 8 and are screw-threaded to pins 35 depending from the cradle.

The two heads for applying the sealing disks 5 are indicated generally at 36 and 37 and inasmuch as they are both substantially alike a description of one will suffice. The construction of these heads is best seen in Figs. 4 and 5. Each is mounted on a carriage 38 which is adjustably carried by the frame 8, each carriage being slidable in ways 39 formed on the frame 8 and being provided with a nut 40 which has screw threaded engagement with an adjusting screw 41 that is journalled in the frame 8 and is provided with a hand wheel 42 by which it may be turned. Each head comprises a plurality of folding jaws 43 which are pivotally mounted at 44 to the arms of a spider 45. This spider is slidably mounted on a sleeve 46 which telescopes into another sleeve 47 that in turn has a telescopic relation with the carriage 38.

Each folding jaw 43 is connected by a link 48 to a collar 49 that is mounted on the end 50 of the sleeve 47. Since the spider 45 is slidably mounted on the sleeve 46 it will be apparent that by reason of the links 48 a relative movement of the spider 45 and collar 50 toward and from each other will cause the folding jaws 43 to turn about their pivots 44.

51 is a spring which encircles the sleeve 46 and is confined between the spider 45 and an annular rib 52 on said sleeve 46, said spring tending normally to force the spider 45 away from the rib 52 and thus to hold the folding jaws in their open position shown in Fig. 4.

The lower folding jaws 43 are provided with a disk-supporting ledge 53 on which the disk 5 may be placed as shown in Fig. 4. Each head also is provided with a presser member 54 adapted to engage the disk 5 and press it firmly against the end of the bundle at the time that the folding jaws operate to fold the peripheral portion of the disk over onto the side walls of the bundle. Each presser member 43 is yieldingly carried by the head and this is herein accomplished by providing each presser member with a stem 55 which is slidable within the sleeve 46 and which is backed by a spring 56 which is situated within said sleeve and engages at one end said stem 55 and at the other end a plug or abutment 57 situated within the sleeve 46. The stem 55 is provided with the slot 58 through which passes a pin 59 carried by the sleeve 46, said pin and slot limiting the movement of the presser member 54 relative to the folding jaws.

The sleeve 46 is provided at its rear end with a stem 60 which extends through and beyond the carriage 38 and is provided at its end with adjustable check nuts 61, the purpose of which will be presently described.

As stated above the heads 36 and 37 are movable from their rearward inoperative position such as shown in Fig. 4 into their operative position shown in Fig. 5 and during such movement the end disk 5 is pressed against the end of the bundle and the folding jaws 43 are operated to fold the peripheral portion 62 of the disk over onto the side of the bundle.

The forward movement of each head is accomplished by moving the sleeve 47 to the left in Fig. 4. The means by which the heads are operated will be presently described.

When each head 36, 37 is in its operative position the folding jaws will be open as shown in Fig. 4 and during the initial movement of each head from its inoperative to its operative position the various parts will move as a unit, the folding jaws remaining in their open position. As the head moves forward the disk 5 is carried against the end of the bundle 1 and during continued movement the folding jaws will give the peripheral portion 62 of the disk an initial folding movement and the presser member 54 will be brought against the disk thus firmly pressing it against the end of the bundle as shown in Fig. 5. As the sleeve 47 continues its forward movement the jaws will move forwardly relatively to the presser disk 54 and the spring 56 will be placed under compression. The sleeves 46 and 47 will continue to move forward as a unit until the corners 63 of the bundle engage the inclined walls 64 of the folding jaws, at which time the jaws and the spider 45 will be prevented from further forward movement.

Continued movement of the sleeves 46 and 47 will operate through the links 48 to rock the jaws about their pivots 44 thus pressing the peripheral portion 62 of the disk 5 firmly against the side walls of the bundle. This portion 62 will preferably be provided with a coating of adhesive material so that when it is clamped against the bundle it will adhere thereto thereby effectively sealing the

end of the bundle. The check nuts 61 serve to limit the extent to which the sleeves 46 and 47 can move forward.

The means for operating the head 37 comprises an actuating lever 640 having a right angular portion 65 and pivoted to the carriage at 66. This portion 65 of the lever is connected by links 67 to the enlarged portion 68 of the sleeve 47 so that when the lever is swung from the full line position shown in Fig. 1 to the dotted line position said sleeve 47 and the head 37 will consequently be moved forwardly thereby performing the end-sealing operations above described.

The right angular portion 65 and the link 67 form in effect a toggle joint which is straightened when the actuating lever is thrown into operative position as shown in Fig. 5 whereby the head will be locked in its end-sealing position.

Means are provided whereby the head 36 will be actuated simultaneously with the head 37 and for this purpose I have provided the following mechanism.

The lever 640 is provided with an extension 68 to which is pivoted one end of a link 69, the other end of said link being connected to a slide 70 which is slidably mounted on a rocking lever 71 that extends longitudinally of the machine and is pivoted centrally at 72 to a supporting bracket 73 carried by the frame 8. This carriage 70 is formed with a projection 74 which operates in a slot 75 formed in a bracket 76 which is secured to and depends from the carriage 38. When the lever 640 is moved from the full to the dotted line position Fig. 1 the downward swinging movement of the extension 68 will operate through the link 69 to depress the right hand end of the lever 71 thus carrying the lever from the full to the dotted line position Fig. 1. The other or left hand end of the lever 71 has a thrust member 77 pivoted thereto to the upper end of which is pivoted two links 78 and 79. The link 78 is pivotally connected at 80 to the carriage 38 on which the head 36 is mounted and the other link 79 is pivotally connected at 81 to the enlarged portion 68 of the sleeve 47 of said head 36. Hence when the lever 71 is rocked into the dotted line position Fig. 1 the upward movement of the left hand end of said lever will throw the links 78, 79 into the dotted line position and thus move the head 38 forwardly, such forward movement resulting in applying the sealing disk 5 to the left hand end of the bundle 1 all as described with reference to Figs. 4 and 5.

The function of the sliding carriage 70 and the slot 75 is to provide for equalizing the movement of the two heads 36, 37. During the initial turning movement of the lever 640 the head 37 will have a maximum rate of speed for any angular movement of the lever and as the lever approaches the dotted line position the movement of the head will slow up relative to the angular movement of the lever because the link 67 and the arm 65 are approaching a straight line position. Since the carriage 70 is guided in the inclined slot 75 it follows that as the lever 71 is swung from the full to the dotted line position the carriage will be moved toward the end of the lever thereby lengthening the lever arm. Consequently the rate at which the lever 71 moves downwardly will be greatest during its initial movement and will gradually decrease as it approaches the dotted line position. Hence the head 36 will have substantially the same relative speed as the head 37.

The carriage 38 on which the head 36 is mounted is slidably supported in ways 82 in a supporting plate 83, the latter being slidable in ways 84 carried by the frame 8 and having a nut 40 through which is threaded the adjusting screw 41. The supporting plate 83 is provided with a bracket 85 which forms a backing for a spring 86 that is interposed between said bracket and the carriage 38. Said carriage has a rod 87 rigid therewith which extends through the bracket and is provided with adjusting nuts 88, this rod limiting the spring impelled movement of the carriage. The spring 81 forms a buffer or cushion which allows the carriage 38 to give or yield in case the bundle of plates being acted on is somewhat longer than normal.

In the operation of the machine the operator will place the wrapping paper, string and stack of plates on the supporting bars 9 and will then actuate the head 11 to compress the stack of plates endwise and will tie the binding twine 2 around the compressed stack of plates and then wrap them in the wrapping material 3, all as above described.

The wrapped bundle of plates is then transferred to the cradle 31 and the two disks 5 are placed on the disk-holding ledges 53 of the heads. The lever 640 is then actuated to apply the disks to the ends of the bundle and seal the latter. After the operator has thrown the lever 640 into the dotted line position thereby to apply the sealing disks to the end of the bundle he will leave the lever in this position so that the clamping pressure on the sealing disks will be maintained while he is bundling and wrapping a second stack of plates. When the second stack of plates has been tied with binding twine and wrapped with the wrapping paper 3 then the lever 640 may be thrown back into its full line position thereby withdrawing the heads 36, 37 from the bundle and the latter may be discharged from the cradle 31 while the second bundle is shifted to said cradle for the purpose of having the ends thereof sealed. In this way the adhesive on the peripheral portion of the disks 5 will be allowed time to set before the sealed bundle is removed from the machine.

I have provided a lifting device for lifting the sealed bundle from the cradle 31. This comprises two lifting fingers 89 which are situated at either end of the cradle and are carried by a bar 90. The latter is connected by a link 91 to a lever 92 which is pivoted at 93 to a fixed arm 94 depending from the frame 8. This lever 92 is connected by a link 95 with a treadle lever 96 which is pivoted at 97 to another fixed bracket arm 98 that depends from the frame. The end 99 of the lever 96 is in position to be actuated by the foot and when it is depressed into the dotted line position the result will be the elevation of the lifting fingers 89 as shown by dotted lines. In this way the sealed bundle may be lifted from the cradle and brought into position where it can be readily removed.

I claim:—

1. In a device of the class described, the combination with two oppositely disposed heads, of means to support a bundle of articles between said heads, each head having means moving therewith for holding a sealing disk in position to be applied to the end of the bundle and also having folding jaws, means to move the heads toward each other thereby to press the disks against the ends of the bundle and then to actuate the folding jaws to fold the peripheral portion of the disks over against the sides of the bundle.

2. In a device of the class described, the combination with two oppositely disposed heads, each having folding jaws, of means to support a bundle of articles between the said heads, each head having means moving therewith to support a sealing disk in position to be affixed to the end of the bundle, a presser member yieldingly carried by each head, means to move the heads toward each other thereby to cause the presser member to press the disks against the ends of the bundle and then to actuate the folding jaws to fold the peripheral portion of the disks against the sides of the bundle.

3. In a device of the class described, the combination with means to support a bundle, of a head having folding jaws certain of which are provided with a support moving therewith for a sealing disk, means to move the head toward the bundle to press the sealing disk against the end of the bundle and then to actuate the folding jaws to fold the peripheral portion of the disk against the sides of the bundle.

4. In a device of the class described, the combination with means to support a bundle, of a head having folding jaws, certain of which are provided with means moving therewith to hold in position a disk to be applied to the end of the bundle, a presser member yieldingly carried by said head, means to move the head toward the bundle to cause the presser member to press the disk against the bundle, and means actuated by the movement of the head for operating the folding jaws to fold the peripheral portion of the disk against the sides of the bundle.

5. In a device of the class described, the combination with means to support a bundle, of two oppositely disposed heads, each having pivoted folding jaws, one of which jaws has a ledge extension to form a support for a sealing disk, means to move the heads toward each other thereby to bring the heads against the ends of the bundle and to bend the peripheral portion of the disk around the corner of the bundle, and means operated by such movement of the head to swing the jaws thereby to press the peripheral portion of the disk against the sides of the bundle.

6. In a device of the class described, the combination with means to support a bundle of articles, of two oppositely disposed heads each having pivoted folding jaws, certain of which jaws have a ledge extension to form a support for a sealing disk, a presser member yieldingly carried by each head, means to move the heads toward each other thereby to cause the presser members to press the disks against the ends of the bundle and to cause the pivoted jaws to bend the peripheral portions of the disks around the corner of the bundle, and means actuated by such movement of the head to swing the jaws and cause them to press the folded peripheral portions of the disk against the sides of the bundle.

7. In a device of the class described, the combination with two oppositely disposed heads each having pivoted folding jaws, of means to support a bundle of articles between said heads, means to support a disk between each head and the corresponding end of the bundle, an actuating lever connected to one of the heads for moving it toward and from the end of the bundle, a pivoted transmitting lever, a connection between one end of said lever and the actuating lever and a connection between the other end of said lever and the other head by which said other head will be moved forwardly as the lever turns whereby when the actuating lever is operated both heads will be moved simultaneously toward the ends of the bundle thereby to press the disks against the ends of the bundle, and means actuated by such movement of the heads to fold the peripheral portion of the disks against the sides of the bundle.

8. In a device of the class described, the combination with two heads each having folding jaws, of means to support a bundle between said heads, means to support a disk between each head and the corresponding end of the bundle, an actuating lever connected to one head and by which it is moved toward and from the end of the bundle, a pivoted transmitting lever, a sliding pivotal connection between the actuating lever and one end

of the transmitting lever, a toggle connection between the other end of the transmitting lever and the other head, whereby movement of the actuating lever will move both heads toward the bundle, and means operated by the movement of the heads to cause the pivoted jaws to fold the peripheral portions of the disk against the sides of the bundle.

9. In a device of the class described, the combination with two oppositely disposed heads each having folding jaws, of means to support a bundle between said heads, each head also having means to support a disk in position to be affixed to the end of the bundle, means to move the heads toward the ends of the bundle to press the disks thereagainst and to actuate the jaws to fold the peripheral portions of the disks against the sides of the bundle, lifting fingers for lifting the bundle from its support, and means to actuate said fingers.

10. In a machine of the class described, the combination with two oppositely disposed heads, of means to support a bundle of articles between said heads, each head having means moving therewith for supporting a sealing disk between itself and the end of the bundle, means to move said heads toward each other thereby to press the disks against the ends of the bundle, said heads being constructed to fold the peripheral portion of the disk over against the sides of the bundle.

11. In a machine of the class described, the combination with means to support a bundle of articles, of a head adjacent one end of said bundle, said head having means moving therewith to support a disk and means to fold the peripheral portion of the disk, and means to move the head toward the bundle and to actuate the folding instrumentalities of said head, whereby the disk will be clamped against the end of the bundle and the peripheral portion of the disk folded over against the sides of the bundle.

In testimony whereof I have signed my name to this specification.

BERT R. WILLIAMSON.