

Dec. 18, 1934.

J. E. OTT

1,984,652

SEALING DEVICE

Filed Jan. 23, 1932

4 Sheets-Sheet 1

Fig. 1

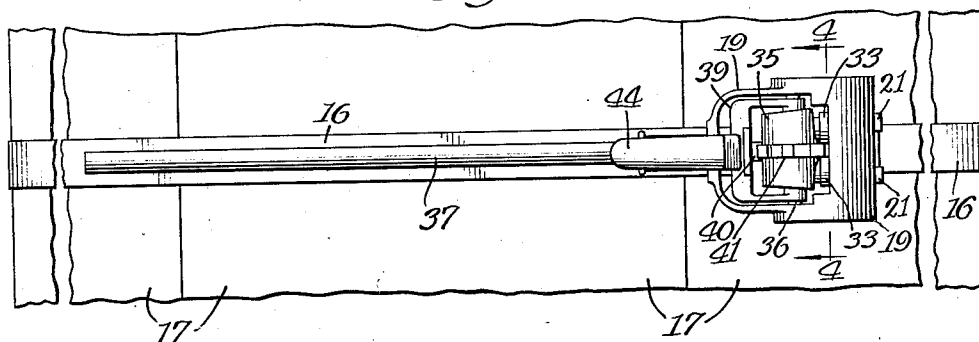


Fig. 2

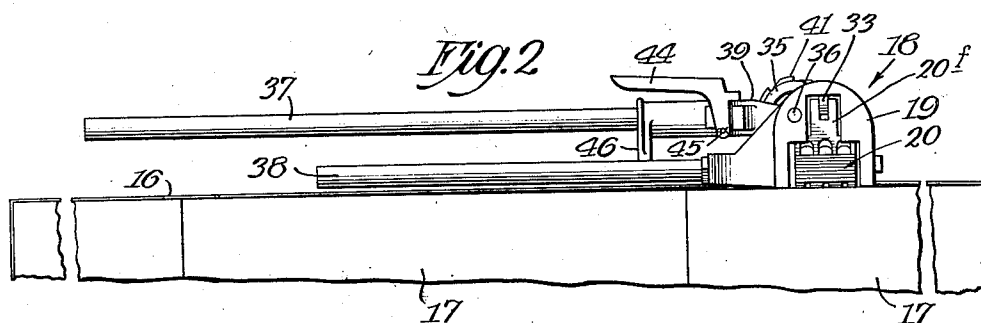
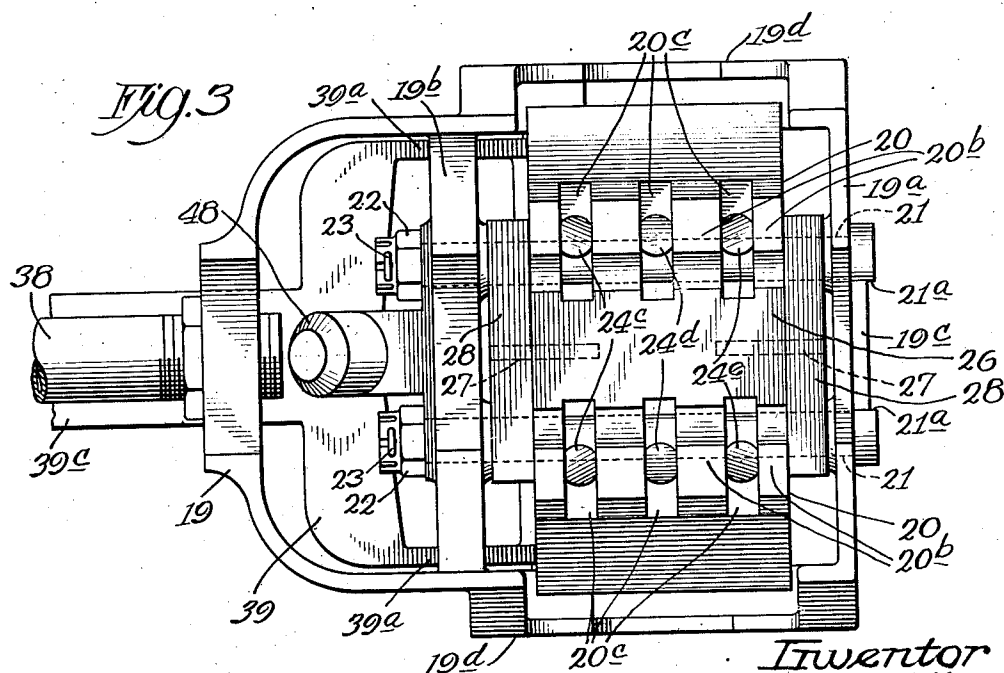


Fig. 3



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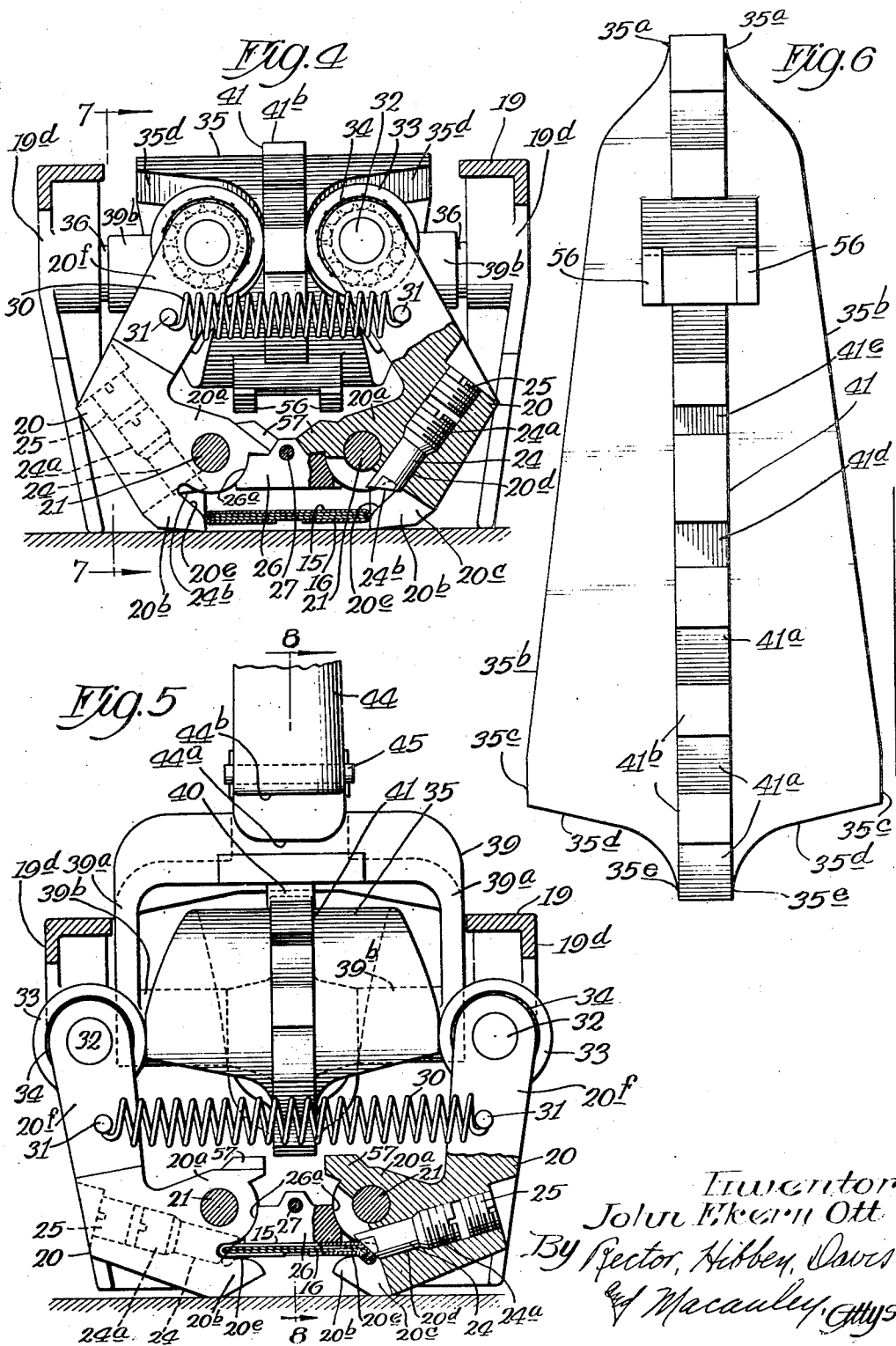
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4 Sheets-Sheet 2



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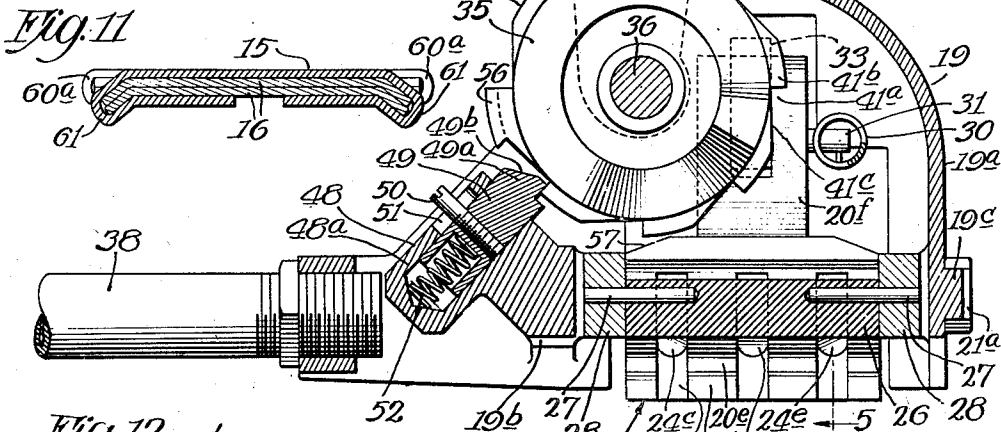
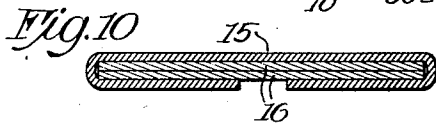
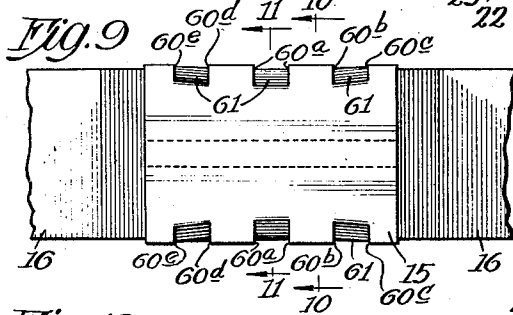
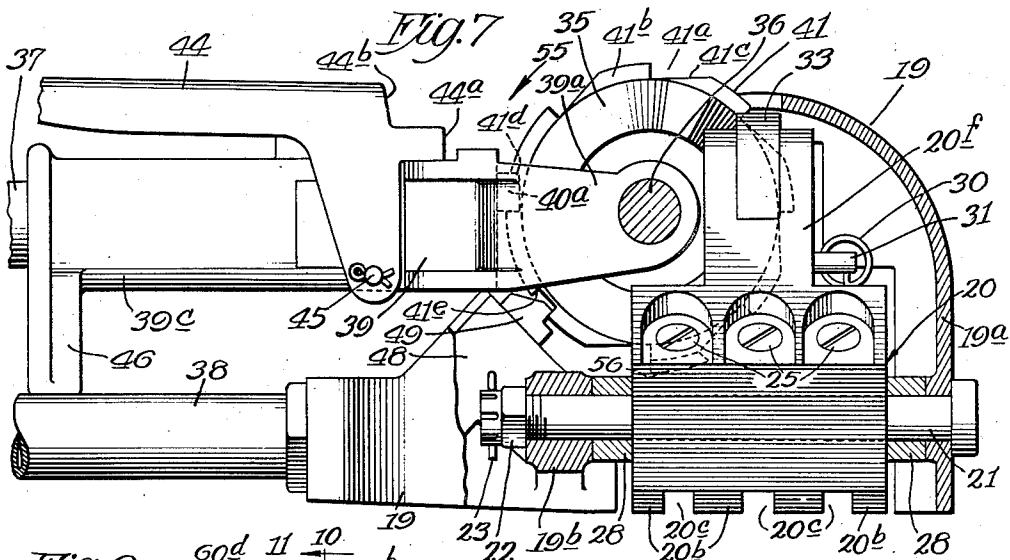
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4 Sheets-Sheet 3



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SEALING DEVICE

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4 Sheets-Sheet 4

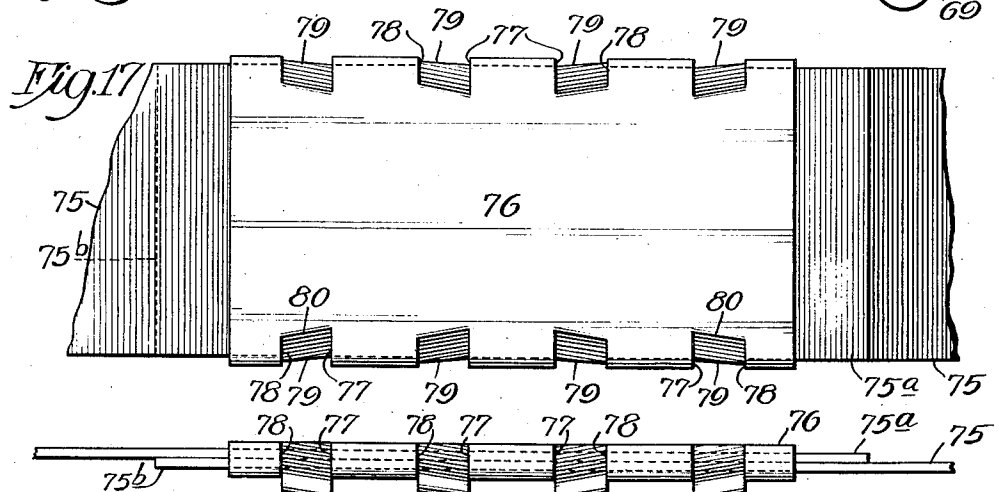
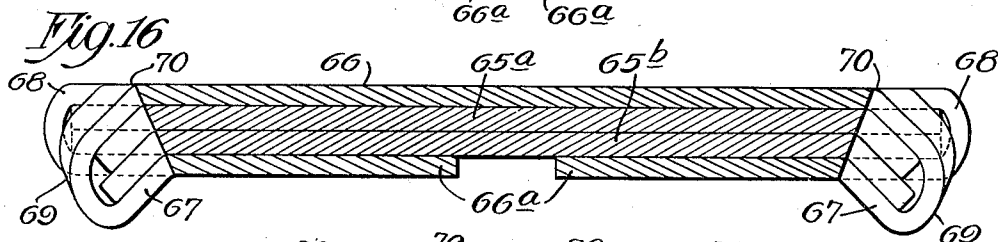
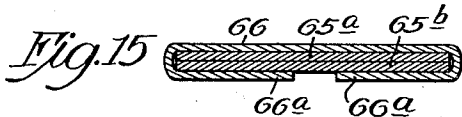
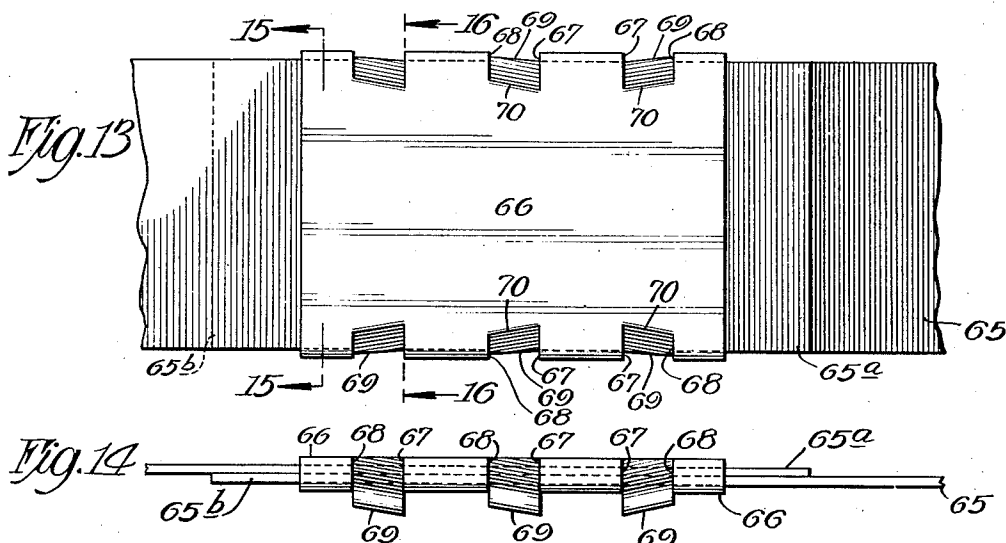


Fig. 18

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UNITED STATES PATENT OFFICE

1,984,652

SEALING DEVICE

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Application January 23, 1932, Serial No. 588,319

17 Claims. (Cl. 81—9.1)

This invention relates to improvements in sealing devices and its purpose is to provide an improved tool for operating upon a metallic seal to seal the overlapping ends of a metal strap.

5 The type of seal formed by the tool of the present invention is similar to that described and claimed in the United States patent of Ralph H. Norton No. 1,260,016, dated March 19, 1918, and the present invention is particularly adapted for

10 use in sealing the ends of straps which are employed in the practice of the method of loading freight cars and the like which is described and claimed in the United States patent of Chester M. MacChesney and John Ekern Ott No. 1,703,-

15 495, dated February 26, 1929. In the practice of this method of loading it is usually desirable to employ a relatively heavy and wide strap which requires the use of a correspondingly heavy seal and in order to shear the edges of the strap

20 and seal to form an interlocking joint of the type disclosed in said patent of Ralph H. Norton, it is necessary to apply a relatively large amount of power to the tool which is employed for that purpose. The sealing devices heretofore em-

25 ployed have not been well adapted for this use because of the large effort required by the operator when applying the necessary power in shearing the edges of the strap and seal and it is therefore the principal object of this inven-

30 tion to provide an improved sealing device which is particularly adapted for use in sealing relatively heavy and wide straps, although the features of the invention are equally capable of use in tools of smaller size. A further object of the

35 invention is to provide an improved sealing device which is capable of use for forming a plurality of pairs of cuts in each edge of the seal and overlapping strap ends, due to the shearing action of the punches of the device, so that by

40 the use of this tool it is possible to obtain a joint which very nearly approximates the strength of the uncut strap at points removed from the joint. The sealing device of the present invention is particularly adapted for use in

45 forming the type of seal joint described and claimed in the co-pending application of John Ekern Ott Serial No. 588,317, filed January 23, 1932, now issued as patent numbered 1,391,239, dated Dec. 20, 1932, wherein there is disclosed a

50 strap seal comprising a sleeve enclosing the overlapping strap ends and having a plurality of transversely deflected lugs along each edge of the seal which are formed by a plurality of pairs

55 of shearing cuts extending inwardly from the edges of the strap and sleeve transversely to the longitudinal axis of the strap. A further object is to eliminate human judgment by providing a sealing tool which cannot be removed

60 from the strap and seal, after the sealing opera-

tion is once begun, until the sealing operation is fully completed.

Still another object of the invention is to provide an improved sealing device comprising a pair of relatively movable jaws carrying punches or dies adapted to operate upon the edges of the strap and seal and comprising parts adapted to be engaged by a rotatable cam so that the jaws and their punches may be forced into engagement with the seal by the application of power to the cam so that a great force may be exerted upon the seal through the jaws with the minimum application of power to the operating handle by which the cam is rotated. A further feature of the invention is the provision of improved means for controlling the operation of the operating cam and the actuation of the relatively movable jaws. Another object is to provide an improved sealing device adapted to extend lengthwise of the strap during its applica-

20 tion to the sleeve for shearing the edges of the strap and seal so that the tool may be applied to the seal in locations which are inaccessible to any of the sealing devices heretofore known. Other objects relate to various features of construction and arrangement which will appear more fully hereinafter.

The nature of the invention will be understood from the following specification taken with the accompanying drawings, in which one embodiment is illustrated. In the drawings,

Fig. 1 shows a top plan view of the improved sealing device applied to a strap which is passed around a series of packages to be bound together;

Fig. 2 shows a side elevation of the sealing device and packages or sheets illustrated in Fig. 1;

Fig. 3 shows an enlarged bottom plan view of the improved sealing device with the outer portions of the handles broken away;

Fig. 4 shows an enlarged transverse section on the line 4—4 of Fig. 1;

Fig. 5 shows an enlarged vertical section on the line 5—5 of Fig. 8;

Fig. 6 shows a plan view of the development of the operating cam;

Fig. 7 shows a vertical section on the line 7—7 of Fig. 4;

Fig. 8 shows an enlarged vertical section on the line 8—8 of Fig. 5;

Fig. 9 shows a top plan view of the improved form of seal joint formed by the tool of the present invention;

Fig. 10 shows a transverse section through the sleeve of the seal and the overlapping strap ends on the line 10—10 of Fig. 9;

Fig. 11 is a detail section taken on the line 11—11 of Fig. 9;

Fig. 12 shows a front elevation of the three

punches or dies which are mounted in one of the jaws of the device for engaging one side of the sealing sleeve;

Fig. 13 shows a top plan view of overlapping strap ends and one form of seal adapted to be formed by the tool of the present invention, in which the deformations are identical in size;

Fig. 14 shows a side elevation of the joint shown in Fig. 13;

Fig. 15 is a transverse section on the line 15-15 of Fig. 13;

Fig. 16 is an enlarged transverse section on the line 16-16 of Fig. 13;

Fig. 17 is a top plan view of a modification of the form of joint illustrated in Fig. 13, showing four pairs of cuts along each side of the seal, to be formed by the tool of the present invention; and

Fig. 18 is a side elevation of the joint shown in Fig. 17.

As shown in the drawings, the sealing device is applied to a sealing sleeve 15 positioned on a steel strap 16 passing around a series of packages or sheets 17 which are adapted to be bound together by the strap. The ends of the strap 16 are threaded in overlapping relation through the sleeve 15 which is formed by bending a sheet of metal into the form of a flat sleeve having a slit or opening along one side where the edges of the metal are spaced apart and the joint between the overlapping ends of the strap is formed by shearing the edges of the sleeve and strap ends to form transversely extending cuts which permit the metal between the cuts of one pair to be deflected transversely during the shearing operation so that the edges of the metal of the strap ends and sleeve at the cuts abut against each other to form an interlocking joint. The sealing device 18 is positioned over the strap 16 to extend longitudinally thereof and it comprises a frame or base 19 which is adapted to straddle the strap and seal and seat upon the surface of one of the packages or sheets 17.

Mounted within the base or frame 19 are a pair of oppositely disposed jaw members 20 which have hub portions 20^a mounted to rock upon longitudinal pivot bolts 21 which extend through the rear wall 19^a of the frame and through the transverse frame member 19^b thereof, being engaged at their forward ends by nuts 22 which are secured against rotation by cotter pins 23. The heads of these bolts 21 are flattened on one side as shown at 21^a to engage a lug 19^c which is formed on the end wall 19^a so that the bolts are thereby held against rotation. The jaw members 20 are provided on their lower portions with downwardly and inwardly extending jaws 20^b which are spaced apart to leave intervening spaces 20^c between them, there being three such spaces 20^c in each of the jaw members 20 in the embodiment illustrated. In alignment with each of the spaces 20^c, each jaw member 20 is provided with an inclined bore or passage 20^d and each bore or passage is engaged by one of the dies or punches 24 which has an externally threaded head 24^a to engage the internally threaded outer enlarged portion of the bore. By this means, each die or punch 24 may be adjusted in position within the bore to vary the portion of the cutting edge 24^b of the die which extends into the opening 20^c and when the die has been adjusted, the outer end of the bore may be closed by a threaded plug 25. Both the die and the plug mounted in each of the bores 20^d are provided with slots at their

ends for engagement by a screw driver. The punches or dies 24, carried by each jaw member, preferably have different configurations, as shown in Fig. 12, where the three jaw members 24^c, 24^d and 24^e have their cutting edges arranged at different angles to the longitudinal axes of the punches so that they engage the edges of the strap seal 15 at different angles when the sealing device is operated. In operation, the spaced jaws are adapted to be passed over the outer edges of the seal in closing the strap ends, as shown in Fig. 4, and then the jaw members are operated to move the jaws 20^b inwardly so that the seal and the enclosed strap end are forced upwardly over the inclined inner surfaces 20^e of the jaws to the position shown in Fig. 5, where the continued pressure of the jaws and the action of the inner edges of the punches 24 serves to shear the edges of the strap and seal to form pairs of cuts with portions of the strap and seal between the cuts deflected downwardly, as more fully described hereinafter.

In order that the intermediate portions of the strap and seal may be supported on their upper sides during the shearing operation, the device is provided with a bridge or saddle 26 which is mounted between the jaw members 20 with its ends engaged by pins 27 which pass through the end bars 28 which extend transversely of the device within the frame 19 and which are held in place by the pivot bolts 21. The bridge 26 is provided with curved edge surfaces 26^a which coact with the similarly curved external hub portions of the jaw members 20 so that the bridge is supported by the jaw members during their pivotal movement and the thrust which is applied to the bridge member by the operation of shearing and bending the seal and strap is transmitted through the bridge member to the jaw members independently through the pins 27 by which the bridge member is held in place.

The jaw members are provided with upwardly and inwardly inclined arms 20^f by which they are rocked about the pivot bolts 21 and these arms are normally moved toward each other, to separate the jaws 20^b of opposite jaw members, by means of a coil spring 30 which has its ends connected to pins 31 projecting from the arms. The arms 20^f of the jaw members are provided at their upper ends with pins 32 on which are mounted cylindrical rollers 33, preferably with roller bearings 34 interposed between the pins and the rollers. When the rollers are forced away from each other, the arms 20^f are operated to force the jaws 20^b of opposite jaw members inwardly toward each other and this movement is effected by means of a cam 35 which is mounted to revolve upon a cam shaft 36, extending between and having its ends secured in the side walls 19^d of the frame or base 19. The cam 35 is provided along its opposite edges with irregular cam surfaces comprising portions 35^a which diverge downwardly at a relatively sharp angle, as illustrated by the development of the cam shown in Fig. 6, and these parts 35^a communicate with the relatively long inclined cam surfaces 35^b which have a lesser inclination and which terminate at their other ends in shoulders 35^c over which the rollers 33 are adapted to pass as they pass into engagement with the cam surfaces 35^d which are directed sharply inward and which communicate gradually with the por-

tions 35^e which are engaged by the rollers 33 when they are in their innermost positions as shown in Fig. 4.

In order to force the rollers 33 outwardly from their innermost positions wherein they engage the closely spaced surfaces 35^e of the cam, the cam is rotated about its shaft through the reciprocation of an operating handle 37 which is adapted to be moved toward and from the base handle 38 which is fixed to the frame or base 19 and which lies over the strap 16, as shown in Figs. 1 and 2. The operating handle 37 is secured to a bracket 39 which forms a part thereof and which has arms 39^a extending inwardly between the side walls of the base 19 and carrying hub portions 39^b which are journaled on the cam shaft 36. The bracket 39 has a handle portion 39^c, to which the handle 37 is secured, and which is provided at its inner end with a longitudinal bore 39^d in which is mounted a pawl 40 carrying at its inner end a blunt-ended tooth 40^a adapted to engage the ratchet wheel 41 which is formed on the outer surface of the cam 35 between the inclined cam surfaces thereof, as shown in Fig. 6. The pawl 40 is normally forced toward the ratchet wheel 41 by means of a coil spring 42 which is mounted in a recess in the inner end thereof and which engages the inner end of the bore 39^d. In order to retract the pawl from engagement with the teeth of the ratchet wheel, it is provided with a projecting pin 43 adapted to be engaged by a flange 44^a formed upon a release lever 44 which is pivoted at 45 on the portion 39^c of the bracket. A coil spring 47^a, mounted in a recess 47 formed within the bracket, bears against a shoulder 44^b on the release lever and normally forces it to a position wherein the flange 44^a engages the part 39^d out of contact with the pin 43. The body portion 44^c of the release lever extends alongside the part 39^c of the bracket and when it is forced toward the bracket, the release lever rocks about its pivot 45 against the action of the spring 46 and thus causes the flange 44^a to engage the pin 43 and withdraw the pawl 40 from engagement with the ratchet wheel 41. When the pawl is in engagement with a notch of the ratchet wheel, the ratchet wheel and cam may be rotated by the reciprocation of the lever and thus the cam may be rotated to separate the rollers 33 of the jaw members and thereby force the jaws into engagement with the strap seal. The handle 37 may be moved from a position substantially at right angles to the handle 38 to a position parallel thereto, in which latter position it is supported by a lug 46 projecting from the bracket 39 and engaging the handle 38, as shown in Fig. 2. During this movement of the handle 37 through an angle of substantially ninety degrees, a substantial angular movement may be imparted to the cam 35 and this movement may be continued by turning the handle to a position at right angles to the base handle 38 and then repeating the motion. For this purpose, the ratchet wheel 41 is provided with a number of notches 41^a and intervening teeth or projections 41^b. Most of the notches 41^a are similar and are each provided at one side with an inclined surface 41^c forming a part of the adjacent projection so that the tooth 40^a of the pawl 40 may ride up over this inclined surface when moving the handle 37 in its reverse direction. However, two of the notches in the ratchet wheel 41 are of angular contour

at both edges, these being the notches 41^d and 41^e, for a purpose hereinafter described. In order to hold the cam and ratchet wheel against rotation during the reverse motion of the operating handle 37, the base 19 is provided with a boss 48 having an internal bore 48^a in which is mounted a detent 49 having a tooth 49^a adapted to engage the notches 41^a, 41^d and 41^e of the ratchet wheel. The detent 49 carries a pin 50 which projects through a slot 51 in the wall of the bore to limit the endwise movement of the detent and the detent is normally forced into engagement with the ratchet wheel by means of a coil spring 52 which is mounted in the inner end of the bore 48^a. The tooth 49^a has an inclined face 49^b on one side so that it can ride over the edges of the notches in the ratchet wheel when the ratchet wheel is rotated in a forward direction by the movement of the handle 37 toward the handle 38. The coil spring 52 maintains the detent in engagement with the outer surfaces of the ratchet wheel so that as soon as the ratchet wheel is released by the pawl 40, the detent moves into engagement with one of the notches to hold the ratchet wheel and the associated pawl 35 against rotation in a reverse direction.

When the rollers 33 are in their innermost positions, as shown in Fig. 4, engaging the portions 35^e of the cam surfaces, the pawl 40 is always in engagement with the square shouldered notch 41^d, from which it cannot be released except by withdrawing the pawl through the operation of the release lever 44, and, at the same time, the holding detent 49 is always in engagement with the other narrow shouldered notch 41^e, as shown in Fig. 7. Assuming that the device has been placed over a strap and seal as shown in Figs. 1 and 2, and that the operator is desirous of beginning the operation of shearing the edges of the strap and seal by moving the jaws 20^b of opposite jaw members toward each other, the first operation is to release the pawl 40 from engagement with the tooth 41^d by pressing the release lever 44 inwardly toward the bracket 39 to which the handle 37 is attached and then the handle 37 is elevated to bring the pawl 40 into a position wherein it engages one of the notches 41^a which may be either the notch 41^a located next adjacent to the notch 41^d or the second notch 41^a therefrom. The handle 37 is then moved toward the handle 38 and the pawl 40 then engages the outwardly extending shoulder at one edge of the notch 41^a so that the cam and ratchet wheel are rotated in the direction indicated by the arrow 55 in Fig. 7. When the handle 37 reaches the limit of its movement, one of the notches of the ratchet wheel is automatically engaged by the holding detent 49 and the handle 37 may then be reversed in direction until the pawl 40 engages a new notch 41^a in readiness for another forward stroke. As this reciprocation of the handle 37 is continued, the rollers 33 ride outwardly away from each other on the inclined cam surfaces 35^a and 35^b, thus moving the jaws 20^b of the jaw members inwardly toward each other and causing the edges of the strap and seal to be sheared in the manner shown in Figs. 5 and 11. When the shearing operation is completed and the jaws 20^b have reached the limit of their inward movements, the rollers 33 will have passed to a position adjacent the shoulders 35^c and at this point, upon the reverse movement

of the lever 37, the tooth 40^a of the pawl rides over the notch 41^e in the ratchet wheel, since this notch is too small in width to receive the tooth of the pawl, and the motion of the lever 37 must therefore be continued until the tooth of the pawl can pass into engagement with the next notch 41^d of the ratchet wheel, which insures a relatively long movement for the last stroke of the lever 37 and insures also the engagement of the handle 37 by the hands of the operator at the time that the rollers 33 ride over the shoulders 35^c onto the sharply inclined cam surfaces 35^d. The inward movement of the rollers is thus under the control of the operator, who may regulate the movement of the handle 37, and this prevents a violent inward motion of the rollers 33 such as might injure parts of the device because of the great strain which is set up therein during the operation of separating the rollers and subjecting the strap and seal to a shearing action at a plurality of points. As the shearing action nears completion and the handle 37 moves downwardly on the last stroke of the cycle, the tooth 40^a of the pawl is in engagement with the notch 41^d until, at the extreme end of the downward motion of the handle 37, the detent 49 engages the notch 41^e and at substantially the same time the teeth 20^b of the jaw members are positively forced away from the edges of the strap and seal by the action of two cam lugs 56 which are formed on the cam at the sides of the ratchet wheel 41 and which are adapted to bear on the inclined faces of lugs 57 which project from the inner hub portions 20^a of the jaw members as shown in Figs. 4 and 5. This engagement positively rotates the jaw members in a direction to disengage the jaws from the edges of the seal and the further movement of the jaws is completed by the action of the coil spring 30 which pulls the arms 20 of the jaw members toward each other as this motion is permitted by the passage of the rollers 33 into engagement with the surfaces 35^d of the cam.

Due to the formation of the notches in the ratchet wheel 41 and the arrangement of the pawl 40 and the detent 49, the ratchet wheel and the connected cam 35 are capable of being rotated in one direction only by the reciprocation of the lever 37. As soon as the movement of the lever is started from its initial upper position toward the base handle 38, the jaws begin to move inwardly and embrace the opposite edges of the strap seal. The detent 49 prevents reverse rotation of the cam and the overlapping of the strap seal by the jaws prevents the removal of the jaws from the strap seal so that it is necessary for the operator to continue the forward rotation of the cam in the direction permitted by the pawl 40 until the cam has made a complete revolution and the shearing of the edges of the strap and seal has been fully completed. This insures a uniform operation of the sealing device upon each strap joint so that the cuts which are made by the shearing dies are of uniform depth and the joints are of substantially uniform strength.

By means of this device, a very great amount of power may be exerted upon the jaws to shear the edges of the strap and seal and this makes it possible not only to shear the edges of relatively wide and heavy straps and seals but also to shear them at a plurality of points so that a number of cuts 60^a, 60^b, 60^c, 60^d and 60^e are formed in the strap and seal along each edge

thereof by the shearing action of the punches or dies 24 in cooperation with the edges of the jaws 20^b. As shown in Fig. 9, the dies 24 may be arranged so that their inner cutting edges have varying inclinations in order that the cuts formed by them are of varying depth. Thus, as shown in Fig. 9, the cuts formed in the edges of the strap and seal by the shearing action referred to, increase in depth from the ends of the seal 15 inwardly toward its middle portion so that the lugs 61 which are deflected downwardly by the action of the dies adjacent the end of the seal have inner boundaries which are inclined to the longitudinal axis of the strap while the inner edges of the central lugs 61 are parallel to the longitudinal axis of the strap and the lugs have a greater deflection due to the greater depth of the cuts 60^a, as compared with the cuts which are formed at the edges of the other lugs. In this way, a seal joint is obtained which is much stronger than any heretofore secured and which closely approximates the strength of the uncut strap.

By employing punches or dies 24 which shear the metal of the seal and strap to form lugs or deformations of unequal depth, as shown in Fig. 9, the punches may preferably be shaped to form lugs or deformations which are identical in form as described and claimed in my patent numbered 1,891,239, dated Dec. 20, 1932, and as illustrated in Figs. 13 to 18, inclusive, of the drawings. In Figs. 13, 14, 15 and 16 there is shown a form of seal joint, adapted to be made by the sealing device of the present invention, in which a plurality of deformations are formed along each edge of the seal and the shears or cuts which are made at each edge of each indentation are the same as those at the corresponding edges of the other indentations. In this form, the strap 65 has one end 65^a overlapping the other end 65^b with the two ends enclosed by the tubular seal 66. The ends of the strap may be threaded through the seal or the walls 66^a of the seal may be bent over the strap after the ends have been overlapped and the deformations along the edges of the seal are formed by the sealing device heretofore described with the result that the seal and strap are sheared or cut inwardly from their edges along spaced lines 67 and 68 to form intervening lugs or deformations 69 which are bent downwardly from the plane of the strap and seal. The deformations are arranged opposite to each other in pairs and the cuts 67 are made deeper than the cuts 68 so that the inner margins 70 of the deformations are inclined longitudinally of the strap. This results also in a downward inclination of the deformations with respect to the plane of the strap, as shown in Fig. 14. The inclination of the margins 70 of the deformations may be about seven degrees to the longitudinal axis of the strap and the deformations of one pair are preferably arranged so that their inner margins are inclined in the opposite direction to the inclination of the inner margins of the other lugs or deformations, since it has been found that this brings about a marked increase in the strength of the joint as compared with its strength when the inner margins 70 are all inclined in the same direction. The cuts 67 are all of the same depth and the cuts 68 are all of a different uniform depth and this permits the use of punches 24 of the same form. The extent to which the cuts 67 and 68 are extended inwardly should preferably vary directly with

the width of the strap. For illustration, with a strap two inches wide, the distance between the two inner ends of opposite cuts 67 may preferably be about 1-43/64 inches while the distance between the inner ends of two of the shorter cuts 67 may preferably be 1-51/64 inches. With these proportions, a joint may be obtained which has a strength equal to about 94% of the strength of the uncut strap. The cuts should preferably be extended inwardly so that when the lugs are deflected downwardly during the action of the dies during the shearing operation, the upper end of the strap and the upper wall of the seal will be deflected downwardly so that they overlap the lower strap end and the lower wall of the seal, as shown in Fig. 16.

In Figs. 17 and 18 there is illustrated another form of joint which may be formed by the use of the sealing device of the present invention. This construction differs from that shown in Fig. 13 in that there are four deflected lugs or deformations along each side of the seal. In this form, the strap 75 has one end 75^a overlapping the other end 75^b with the overlapping ends enclosed by tubular seals 76. The edges of the strap and seal are sheared by the action of the dies 24 to form pairs of inwardly extending cuts 77 and 78 which are spaced apart with a downwardly deflected lug or deformation 79 between each pair of cuts. The lugs 79 are arranged opposite to each other in pairs and the cuts 77 are extended inwardly to a greater extent than the cuts 78 so that the inner margin 80 of each lug or deformation is inclined with respect to the longitudinal axis of the strap. The cuts 77 and 78 are preferably so arranged that the inner margins 80 of the lugs of two pairs are inclined in one direction while the inner margins of the other two pairs of lugs are inclined in the opposite direction, since it has been found that this arrangement gives the maximum strength of joint, which may be 96% of the strength of the uncut strap if the cuts have the proportions with respect to the width of the strap explained above in connection with Fig. 13.

Although one form of the improved sealing device has been shown and described by way of illustration in connection with three forms of joints which may be formed by the use thereof, it will be understood that the invention may be embodied in various forms and may be used in various ways within the scope of the appended claims.

I claim:

1. A sealing device comprising a frame, a pair of relatively movable members carried by said frame for engaging a strap seal and deforming portions thereof, means for effecting relative movement of said parts and holding said members in the relative positions to which they are advanced, and further means for preventing reverse operation of said first-named means until the deformation of the seal is completed.

2. A sealing device comprising a pair of relatively movable jaw members adapted to engage a strap seal, a cam rotatable between parts of said jaw members and adapted by successive angular movements thereof in the same direction to effect movements of said jaw members toward and from each other for deforming and then releasing a strap seal, means for maintaining said jaw members in operative relation to said cam, and means having relative movement

with respect to said cam for effecting intermittent rotation of said cam.

3. A sealing device comprising a frame, relatively movable jaw members carried by said frame and having arms extending therefrom, a rotatable cam having opposed cam surfaces movable between said arms, a ratchet wheel movable with said cam and having notches therein, a reciprocating lever, a pawl carried by said lever for engaging said notches, and a detent carried by said frame and adapted to engage one of said notches for holding said ratchet wheel and cam against reverse rotation.

4. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a rotatable cam for effecting relative movement of said jaws, said cam having an inclined cam surface terminating in an angular shoulder, a ratchet wheel mounted for movement with said cam, an operating lever, a pawl carried by said lever for engaging said ratchet wheel, means connected with one of said jaw members for movement over said cam surface, and means for rendering said lever effective to control movement with respect thereto of said ratchet wheel in either angular direction during the movement of said last named means over the shoulder of said cam surface.

5. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame, a pair of arms extending from said jaws, a rotatable cam having inclined cam surfaces movable between said jaws and terminating in angular shoulders, a ratchet wheel movable with said cam and having a plurality of teeth of different configuration, an operating lever, and a pawl carried by said lever to engage the notches of said ratchet wheel, said ratchet wheel and said pawl having coacting parts for preventing relative movement of said ratchet wheel and said lever during the actuation of said cam to move said arms over said shoulders of said cam surfaces.

6. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam for effecting relative movement of said jaws, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, a pawl carried by said lever for engaging said ratchet wheel, and a detent carried by said frame to engage said ratchet wheel and hold it against reverse rotation.

7. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam for effecting relative movement of said jaws, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, said ratchet wheel comprising a series of notches each having one inclined side and one notch having shoulders at both sides thereof, a pawl carried by said lever for engagement with said notches, and means carried by said lever for releasing said pawl from said shouldered notch.

8. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam for effecting relative movement of said jaws, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, said ratchet wheel having a series of notches each formed with one inclined side and two notches each having shoulders at both sides thereof, a blunt-ended pawl carried by said lever, one of

said shouldered notches being too narrow to be engaged by said pawl, and a detent carried by said frame for holding said ratchet wheel against rotation, said detent being adapted to engage said narrow shouldered notch at the time that said operating lever completes a forward movement with said pawl in engagement with the other of said shouldered notches.

9. A sealing device comprising a frame, a pair of oppositely movable jaw members carried by said frame and having parts adapted to engage a strap seal, means comprising a cam rotatable in one direction for effecting relative movement of said jaws in opposite directions, a ratchet wheel movable with said cam, a pivotally mounted operating lever, a pawl carried by said lever and having a tooth adapted to engage said ratchet wheel, and means mounted on said lever for manually withdrawing said pawl from said ratchet wheel.

10. A sealing device comprising a frame, a pair of oppositely movable jaw members carried by said frame and having parts adapted to engage a strap seal, means comprising a rotatable cam for effecting relative movement of said jaws, a ratchet wheel movable with said cam, a pivotally mounted operating lever, a pawl slidably mounted on said operating lever and having a part adapted to engage said ratchet wheel, a pin projecting from said pawl, a release lever pivotally mounted on said operating lever and having a part adapted to engage said pin, and resilient means engaging said levers for normally maintaining said part of said release lever out of engagement with said pin.

11. A sealing device comprising a pair of relatively movable jaws adapted to engage a strap seal, and a plurality of punches carried by each of said jaws for cutting the edges of said seal at a plurality of points, said punches on each of said jaws having cutting edges of varying configuration whereby cuts of varying depth are formed in the edges of said strap seal.

12. A sealing device comprising a frame, a pair of members carried by said frame to engage a strap seal to effect the deformation thereof, means for effecting relative movement of said members, and means operatively related with said first named means for maintaining the engagement of said members with said seal after their relative movement has started until the deformation of the seal is completed.

13. A sealing device comprising a pair of relatively movable jaws adapted to engage a strap seal, a plurality of punches carried by said jaws for cutting the edges of said seal at a plurality of points, means for moving said jaws toward each other, and means associated with said last named means for preventing reverse movement of said jaws and the disengagement thereof from said seal until the cutting of the edges of said seal by said punches has been completed.

14. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam movable between said jaws for effecting relative movement of said jaws toward and from each other, resilient means for maintaining parts of said jaws in operative relation to said cam, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, said ratchet wheel having a series of notches each having one inclined side and one notch having shoulders on both sides thereof, a pawl carried by said

lever for engagement with said notches, said pawl being shaped to prevent relative rotation of said lever and said ratchet wheel in either direction when said pawl is in engagement with said notch having shoulders at both sides thereof, said cam having shoulders adapted to pass between parts of said jaw members when said pawl is in engagement with said notch having shoulders at both sides thereof.

15. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam movable between said jaws for effecting relative movement of said jaws toward and from each other, resilient means for maintaining parts of said jaws in operative relation to said cam, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, said ratchet wheel having a series of notches each having one inclined side and one notch having shoulders on both sides thereof, a pawl carried by said lever for engagement with said notches, said pawl being shaped to prevent relative rotation of said lever and said ratchet wheel in either direction when said pawl is in engagement with said notch having shoulders at both sides thereof, said cam having shoulders adapted to pass between parts of said jaw members when said pawl is in engagement with said notch having shoulders at both sides thereof, and means carried by said lever for releasing said pawl from said double shouldered notch.

16. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame for engaging a strap seal, a cam movable between said jaws for effecting relative movement of said jaws toward and from each other, resilient means for maintaining parts of said jaws in operative relation to said cam, a ratchet wheel movable with said cam, an operating lever pivotally mounted on said frame, said ratchet wheel having a series of notches each having one inclined side and one notch having shoulders on both sides thereof, a pawl carried by said lever for engagement with said notches, said pawl being shaped to prevent relative rotation of said lever and said ratchet wheel in either direction when said pawl is in engagement with said notch having shoulders at both sides thereof, said cam having shoulders adapted to pass between parts of said jaw members when said pawl is in engagement with said notch having shoulders at both sides thereof, a detent adapted to engage the notches of said ratchet wheel for preventing reverse rotation of said cam, said ratchet wheel having a notch of such formation that it is incapable of being engaged by said pawl but is adapted to be engaged by said detent when the seal-engaging portions of said jaws reach the limit of their movement away from each other.

17. A sealing device comprising a frame, a pair of relatively movable jaws carried by said frame, a pair of arms carried by said jaws, a rotatable cam movable between said arms and having cam surfaces adapted to cooperate with said arms to move said jaws into engagement with a strap seal, means for rotating said cam and thereby operating said jaws, and means carried by said cam for automatically disengaging said jaws from the strap seal at the conclusion of a seal deforming operation effected by the relative movement of said jaws.

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