July 7, 1942. F. MOLL ET AL 2,288,827

COMBINATION CLAMP AND CUTTER FOR X-RAY FILMS

Filed Jan. 15, 1940 3 Sheets-Sheet 1

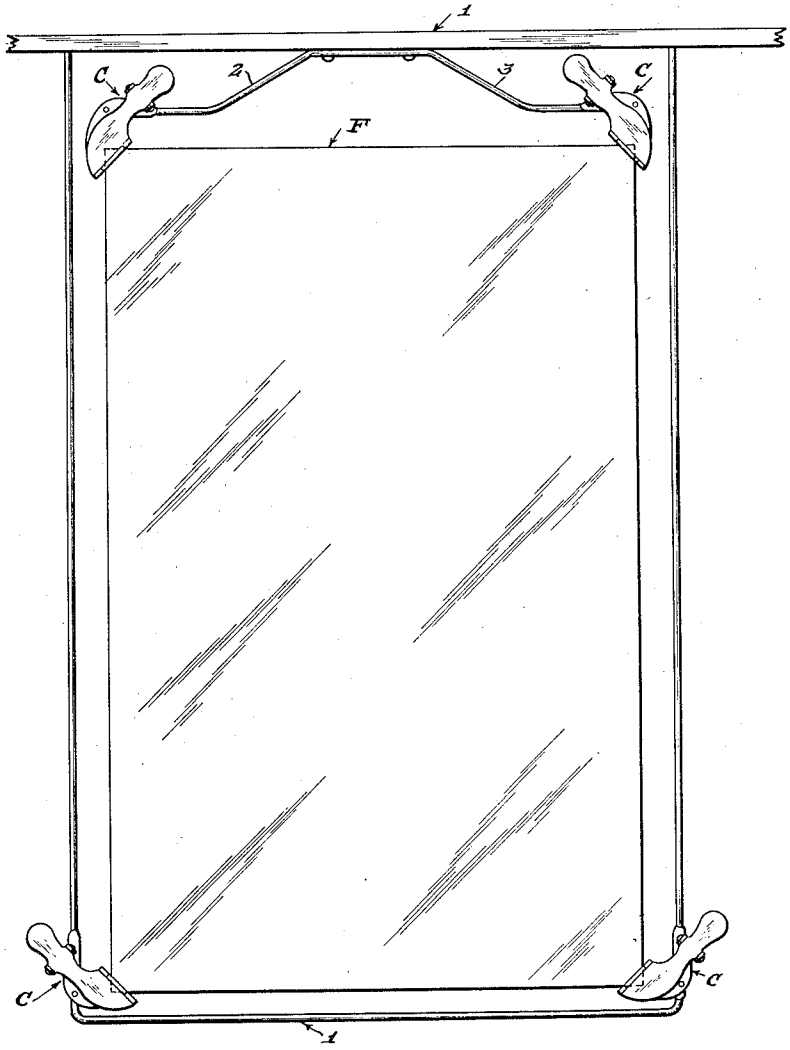


FIG. 1.

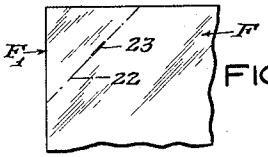


FIG. 3.



FIG. 4.

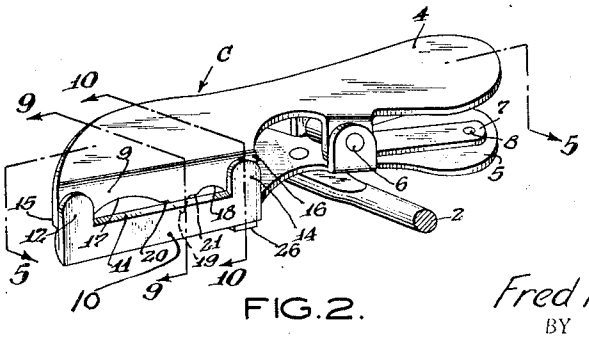


FIG. 2.

INVENTORS
Fred Moll AND Carye Belle Henle
BY
Mock & Blum
ATTORNEYS

July 7, 1942. F. MOLL ET AL 2,288,827

COMBINATION CLAMP AND CUTTER FOR X-RAY FILMS

Filed Jan. 15, 1940 3 Sheets-Sheet 2

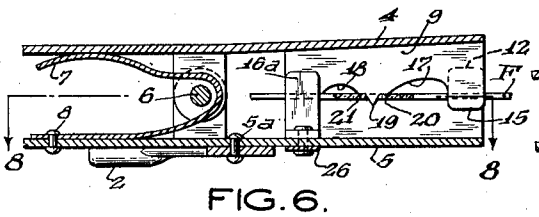


FIG. 6.

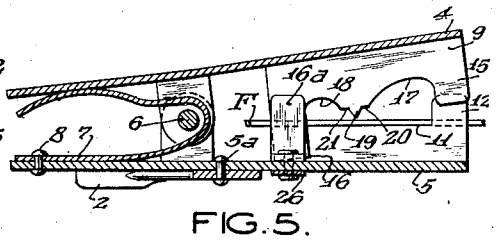


FIG. 5.

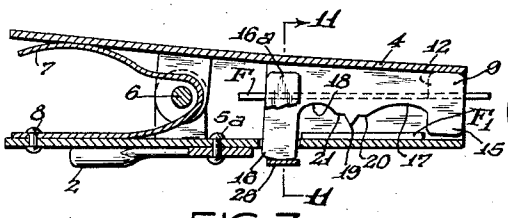


FIG. 7.

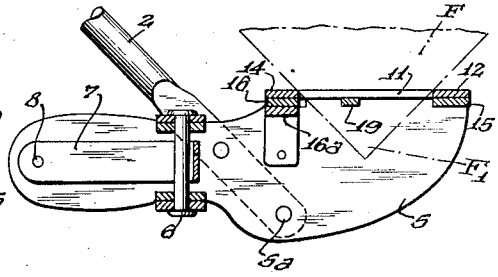


FIG. 8.

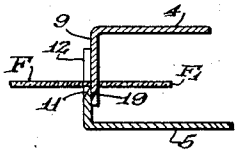


FIG. 9.

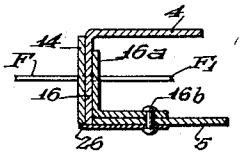


FIG. 10.

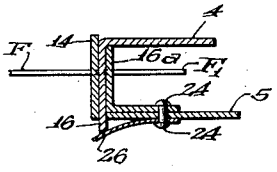


FIG. 11.

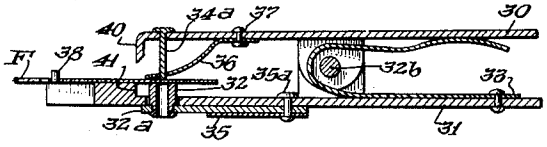


FIG. 16.

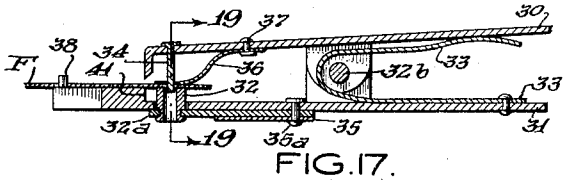


FIG. 17.

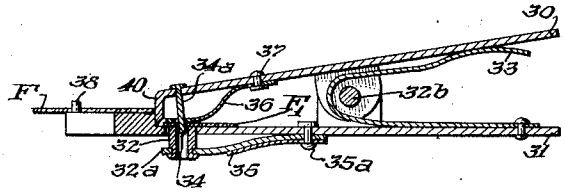


FIG. 18.

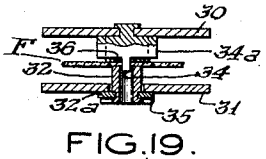


FIG. 19.

INVENTORS

Fred Moll AND Carye Belle Henle

BY

Mock & Blum

ATTORNEYS

July 7, 1942. F. MOLL ET AL 2,288,827

COMBINATION CLAMP AND CUTTER FOR X-RAY FILMS

Filed Jan. 15, 1940 3 Sheets-Sheet 3

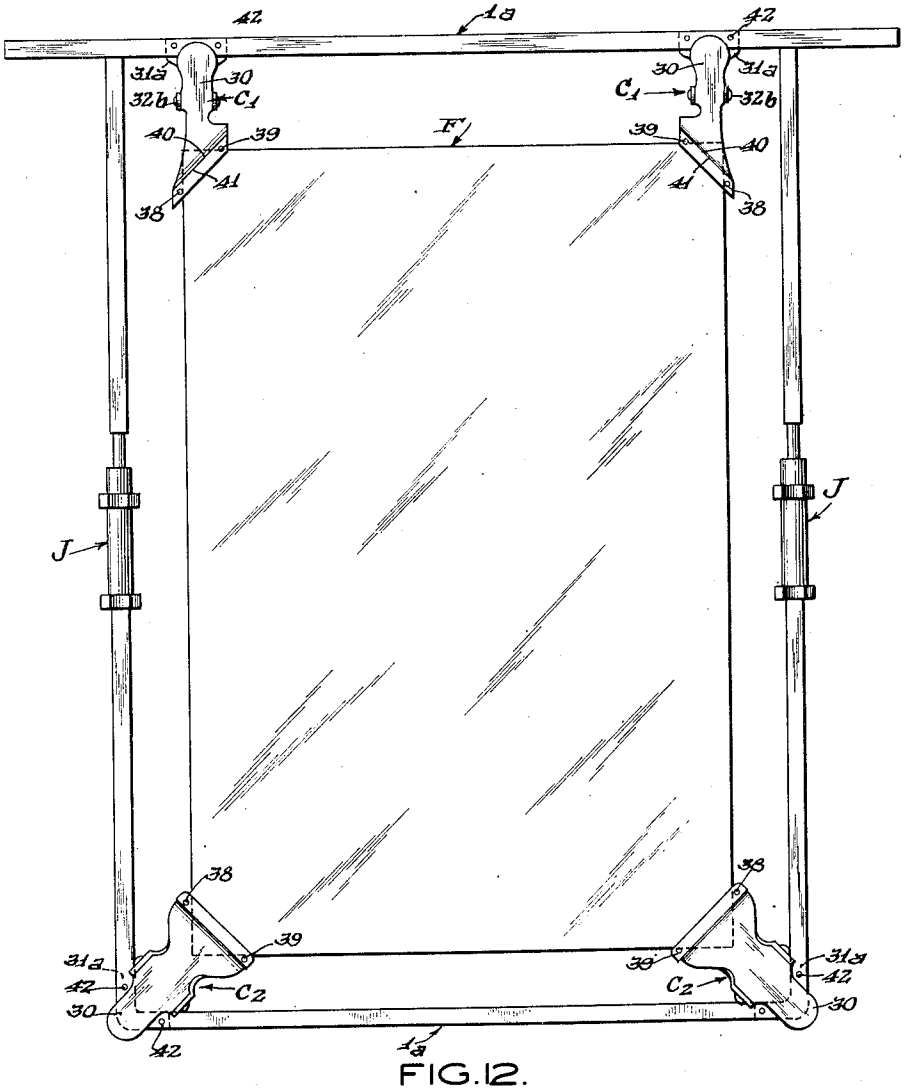


FIG.12.

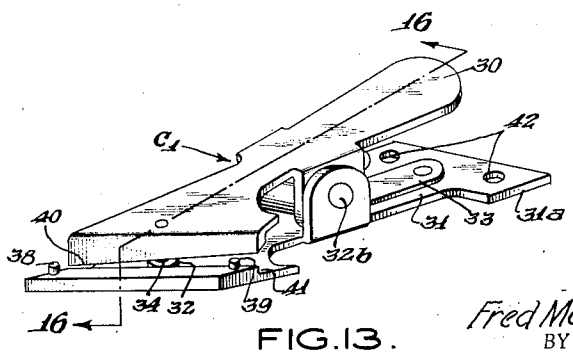


FIG.13.

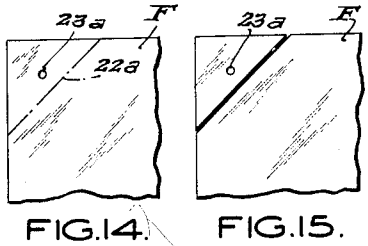


FIG.14.

FIG.15.

INVENTORS

Fred Moll AND Carye Belle Henle

BY

Mocks Blum

ATTORNEYS

Patented July 7, 1942 2,288,827

UNITED STATES PATENT OFFICE

2,288,827

COMBINATION CLAMP AND CUTTER FOR X-RAY FILMS

Fred Moll, Ridgefield, and Carye-Belle Henle, Newark, N. J.

Application January 15, 1940, Serial No. 314,016

5 Claims. (Cl. 164—120)

Our invention relates to a new and improved combination clamp and cutter for X-ray films and for other purposes.

One of the objects of our invention is to provide a device having opposed jaws, for clamping the corner of an X-ray film or the like, said jaws being movable towards each other and being provided with cutting means, so that the X-ray film or other object can be released from the clamp by moving said jaws towards each other, thus cutting off the clamped portion of the X-ray film or the like.

Another object of the invention is to provide a device of simple and efficient construction, and which can be manufactured at low cost.

Other objects of our invention will be stated in the annexed description and drawings which illustrate preferred embodiments thereof.

Fig. 1 is a front elevation of a frame to which the improved devices have been applied.

Fig. 2 is a perspective view of one of the improved combination clamps and cutters.

Fig. 3 is a partial view of an X-ray film, showing the line along which a corner of the film is clamped and also showing the portion of the film which is perforated during the clamping action and prior to cutting off the corner of the film.

Fig. 4 is a view similar to Fig. 3, showing the line along which the corner of the film is cut off from the body of the film.

Fig. 5 is a sectional view on the line 5—5 of Fig. 2, showing the device in its open position, in which the device neither clamps nor cuts the film.

Fig. 6 is a view similar to Fig. 5, showing the jaws in the position in which they perforate and clamp the film, but without cutting the film. This may be designated as the normal position of the parts, because said parts are urged to and held in this position by the spring-means.

Fig. 7 is a view similar to Figs. 5 and 6, showing the jaws in the position in which they cut the film.

Fig. 8 is a sectional view on the line 8—8 of Fig. 6.

Figs. 9 and 10 are respectively sectional views on the lines 9—9 and 10—10 of Fig. 2.

Fig. 11 is a sectional view on the line 11—11 of Fig. 7.

Fig. 12 is a view similar to Fig. 1, showing a modification of the invention.

Fig. 13 is a perspective view of one of the clamping and cutting devices which are shown in Fig. 12.

Fig. 14 is a view similar to Fig. 3, showing the line along which the device which is shown in Fig. 12, perforates and clamps the film.

Fig. 15 is a view similar to Fig. 4, and showing the final cutting action of the device which is shown in Figs. 12 and 13.

Fig. 16 is a sectional view on the line 16—16 of Fig. 13.

Fig. 17 is a view similar to Fig. 16, showing how the jaws of the device which is shown in Fig. 16 have been manipulated so as to perforate and clamp the film, without cutting through the film. This view also illustrates the action of the punch-pin.

Fig. 18 is a view similar to Fig. 16, showing the jaws in their final position, in which they have cut the film.

Fig. 19 is a sectional view on the line 19—19 of Fig. 17.

Heretofore, in mounting X-ray films in a frame in order to hold the film flat and planar during the operations of developing, fixing, washing, drying, etc. it has been customary to provide ordinary clamps or clips, which could not be operated so as to cut the film. The conventional clamp has a punch-pin which perforates the film. After the film had been processed, it was necessary to open the clamp and to remove the film from the punch-pin, and then to cut off the corner of the film by means of a pair of scissors or by a cutter.

By using our improved device, the clamped corner or other portion of the film can be completely severed from the body of the film, so that the film can be removed from the clamps with the corners severed, causing much less delay and manipulation.

The frame 1 may be of any conventional or adjustable type. It is provided at its top with resilient metal members 2 and 3 which can be wires, springs, etc. Two of the combination devices C are respectively connected to said members 2 and 3, in order to exert tension on the film. The other two combination devices C are connected to the frame, adjacent the other corners thereof. The base plates of said other devices C may be connected to one or two legs of the frame, at the respective corners.

As shown in Fig. 2, each combination device comprises arms 4 and 5. These arms are provided with cooperating lugs, which are connected by a pivot pin 6. A conventional blade spring 7 normally and resiliently holds the arms 4 and 5 in the normal position shown in Fig. 2.

As shown in Fig. 6, one leg of the blade spring 7 is connected to the arm 5 by means of a rivet 8. The free edges of the arms 4 and 5 are pro-

vided with the cooperating side jaws 9 and 10. The jaw 10 has a sharpened shearing portion 11 and upstanding lugs 12 and 14. The jaw 9 is provided with corresponding depending lugs 15 and 16. Between the lugs 15 and 16, the jaw 9 is provided with a shearing edge. This consists of inclined or concave edge portions 17 and 18, an intermediate perforating portion 19, and edge portions 20 and 21 which are substantially parallel to the perpendicular to the axis of the pivot pin 6, when the device is in the normal position shown in Fig. 2. Said edge portions 20 and 21 can be omitted without departing from the invention, so that the concave cutting faces 17 and 18 may meet in a point.

When the corner of the film is clamped between the jaws 9 and 10, the film is clamped without completely cutting it, and the perforating or punch portion 19 pierces the film. This element 19 is aligned with the cutting means, so that the hole which is formed by member 19 is continuous with the line of cut. The elements 20 and 21 have sharp edges, but they act as stops so as to limit the closing movement of the jaws, under the force of the spring 7. This position of the film F is clearly shown in Fig. 6. The corner of the film is then located, as shown in Fig. 8, between the pairs of lugs 12—15, and 14—16. When it is desired to cut off the corner of the film and to release the film, the jaws 9 and 10 are forced towards each other, until the corner of the film is completely cut off by the shearing portions of the jaws 9 and 10.

Fig. 3 shows the line 22 along which the corner of the film is cut off. This line may have any shape, instead of being a straight line, by suitably shaping the cutting elements. The portion 23 of said line shows the portion of the film which is perforated by the member 19, in order to engage the film.

When the jaws have been moved towards each other in order to cut off a part of the film, the lug 15 abuts or substantially abuts a portion of the arm 5. Lug 15 thus acts as a stop to limit the movement of the jaws towards each other. In the cutting position of the device which is clearly shown in Fig. 11, the lug 16 laterally overlies the edge of the arm 5. For this purpose a slot is provided in the arm 5, between the body of said arm and the upstanding jaw 10. The jaw 9 is therefore guided relative to jaws 10, when said jaws are operated to cut the film. A supplemental blade spring 26 is connected to the arm 5 by means of a rivet 24. The free end of the lug 16 contacts with the spring 26, when the parts are in the normal position shown in Fig. 2. The force of the spring 26 is opposed to the force of the spring 7, and these two springs balance each other when the device is in the normal position shown in Fig. 2. The cutting edges are then in inoperative position, because they have not cut off the corner of the film, so that the film is then held by the perforating extension.

In order to cut off the corner of the film, pressure is applied to the arms 4 and 5 adjacent the lugs 12 and 15. The spring 26 is flexed by lug 16, when the jaws 9 and 10 are in final cutting position.

As shown in Fig. 10, an angular plate 16*a* is connected to the arm 5 by means of a rivet 16*b*. The lug 16 is guided slidably between the upstanding portion of the arm 16*a* and the lug 14.

This embodiment is preferable to the second embodiment, since in the first embodiment there are no punch-pins or the like which engage the cut-off part of the film.

The second embodiment comprises arms 30 and 31, having lugs which are connected by a pivot pin 32*b*. The blade spring 33 corresponds to the blade spring 7. The arm 30 is provided at its free end with a punch-pin 34*a*. The free end of the arm 31 has a bore in which a hollow bushing 32 is slidably located. Said hollow bushing 32 is connected to a blade spring 32*a* which is connected by a rivet 35*a* to the arm 31. An additional reinforcing spring 35 is also connected to the arm 31 by the rivet 35*a*. The arm 30 is provided with a stripping spring 36 which is connected thereto by means of a rivet 37. In the normal relative positions of the punch-pin 34*a* and of the bushing 32, the punch-pin 34*a* partially enters the bore of said bushing, as shown in Fig. 17. This corresponds to Fig. 6 of the first embodiment. The arm 31 is provided with pins 38 and 39, between which the corner of the film is inserted.

In order to use the device of the second embodiment, the rear ends of the arms 30 and 31 are pressed towards each other so as to move the punch-pin 34*a* out of the bushing 32. The corner of the film F is then pushed between the pins 38 and 39, so that said corner overlies the bushing 32. This position is shown in Fig. 16. The arms 30 and 31 are then released. The force of the spring 33 may be sufficient or insufficient to force the punch-pins 34 through the film F. Upon applying slight pressure to the free or front ends of the arms 30 and 31, the punch-pin 34*a* is forced through the film to enter the bore of the bushing 32. This is the position shown in Figs. 17 and 19. As shown in Fig. 19, the punch-pin 34 has an enlargement 34*a* which then abuts the top of the end of the bushing 32, so as to act as a stop.

When it is desired to remove the film, the free end of the arm 30 is pushed towards the free end of the arm 31, so that the bushing 32 is forced into the position shown in Fig. 18. The arm 30 is provided with a shearing jaw 40 and the arm 31 is provided with a corresponding shearing jaw 41.

After the corner of the film has been cut off, the jaw 40 is moved away from the jaw 41. The stripping spring 36 has a bore through which the punch-pin 34 extends.

After the corner of the film has been cut off, the device is opened, and the stripping spring facilitates the removal of the cut-off corner of the film from the device.

The arms 31 are provided with bores 42 by means of which said arms 31 can be connected to the frame. As shown in Fig. 12, the combination devices can be of different shapes, but the mechanical action is the same. The frame which is shown in Fig. 12 is provided with adjusting means J, which may be of any conventional type.

As shown in Fig. 8, the arm 5 of the first embodiment is fastened by means of members 5*a* to the resilient member 2 or 3 or to any part of the frame 1.

In the broadest aspect of our invention, it covers a device having means which are adapted to grip an X-ray film or the like, without cutting off the gripped object, said means being movable relative to each other from their gripping position, either to cut off or to indent the gripped object. The invention would therefore include a device in which the film or the like is indented

sufficiently so as to enable the gripped object to be readily severed along the line of indentation. Likewise the invention is not limited to means which punch or perforate the object, when the jaws or the like are moved into gripping position. Likewise the invention is not limited to a device in which the film or the like is either indented or cut along the line of gripping.

Therefore whenever we refer in the claims to a cutter or to cutting the film or the like, we include a device in which the film or the like is indented or scored so as to weaken the same, in addition to a device which cuts through the film or the like.

While the perforating means 19 and 34*a* are located on one of the jaws, in each of the embodiments described, it would not be departing from the invention if perforating means were located on each of the jaws. When the jaws are moved towards each other, the film is first perforated and gripped. When the jaws are moved beyond said gripping position the film is cut through-and-through.

It will be noted that the perforating position which is shown in Figs. 2 and 17 is in advance of the cutting position of the arms which is shown in Figs. 7 and 8. The arms are provided with spring means which maintain the same normally in perforating position.

Whenever we refer in the claims to providing one of the cutting means with a perforating extension, we include a device in which each of said cutting means has one or more perforating extensions.

We claim:

1. A device having a pair of jaws which are movable towards and away from each other, said jaws having respective cutting edges which are located to exert a shearing action when said jaws are moved to shearing position, one of said cutting edges having a perforating extension which is adapted to perforate an object which is held by said perforating extension between said edges, when said jaws are in advance of their cutting position, said device having spring means adapted to maintain said jaws in a predetermined normal position in which the perforating extension of one cutting edge extends beyond the other cutting edge and said cutting edges are in inoperative position, said perforating extension being located intermediate the ends of the respective cutting edge and being aligned with said cutting edge.

2. A combined clamping and cutting device comprising a first arm and a second arm, means pivotally connecting said arms intermediate the ends thereof, the first arm having a first depending jaw at one end thereof, the second arm having a second upstanding jaw at the corresponding end of said second arm, said jaws having cooperating cutting faces, the first jaw having a perforating extension which extends below the cutting portion of the second jaw when the other part of the cutting portion of the first jaw is spaced from the cutting portion of the second jaw, the first jaw having a depending lug which extends below the first arm when said cutting portions are in cutting position, said second arm having a spring which is located to abut and to be flexed by the end of said lug, when said portions are in cutting position.

3. A device comprising a first arm and a second arm, means pivotally connecting said arms, said arms having cutting means adapted to cut an object which is located between said cutting means when said cutting means are in relative cutting position, at least one of said arms having perforating means which are adapted to perforate an object which is located between said arms when said arms are in perforating position, said perforating position of the arms being in advance of their cutting position, spring means adapted to maintain said arms normally in perforating position and with their cutting means in inoperative position, said perforating means being located intermediate the ends of said cutting means.

4. A device having a supporting frame and also having a pair of jaws each of which is movable towards the other and away from the other, said jaws having a pair of cutting edges which exert a shearing action when said jaws are moved to shearing position, said device also having a gripping member which is adapted to hold an object which is located between said jaws when said jaws are in advance of their final shearing position, said device having means adapted to maintain said jaws in a predetermined normal position in which said cutting edges are in advance of their final shearing position and in which said holding member is in operative holding position, said jaws and said holding member being spaced wholly from said frame.

5. A device having a pair of jaws each of which is movable towards the other and away from the other, said jaws having a pair of cutting edges which are located to exert a shearing action when said jaws are moved to shearing position, said device also having a perforating holding member which is adapted to perforate and to hold an object which is located between said jaws when said jaws are in advance of their final shearing position, said device having resilient means which yieldingly bias said jaws to a predetermined normal position in which said cutting edges are in advance of their final shearing position and in which said perforating and holding member is in operative perforating and holding position, said perforating holding member being secured to one of said jaws, said perforating holding member extending beyond the other jaw, which said jaws are in said predetermined normal position.

FRED MOLL.
CARYE-BELLE HENLE.