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METHOD OF MAKING STAPLES

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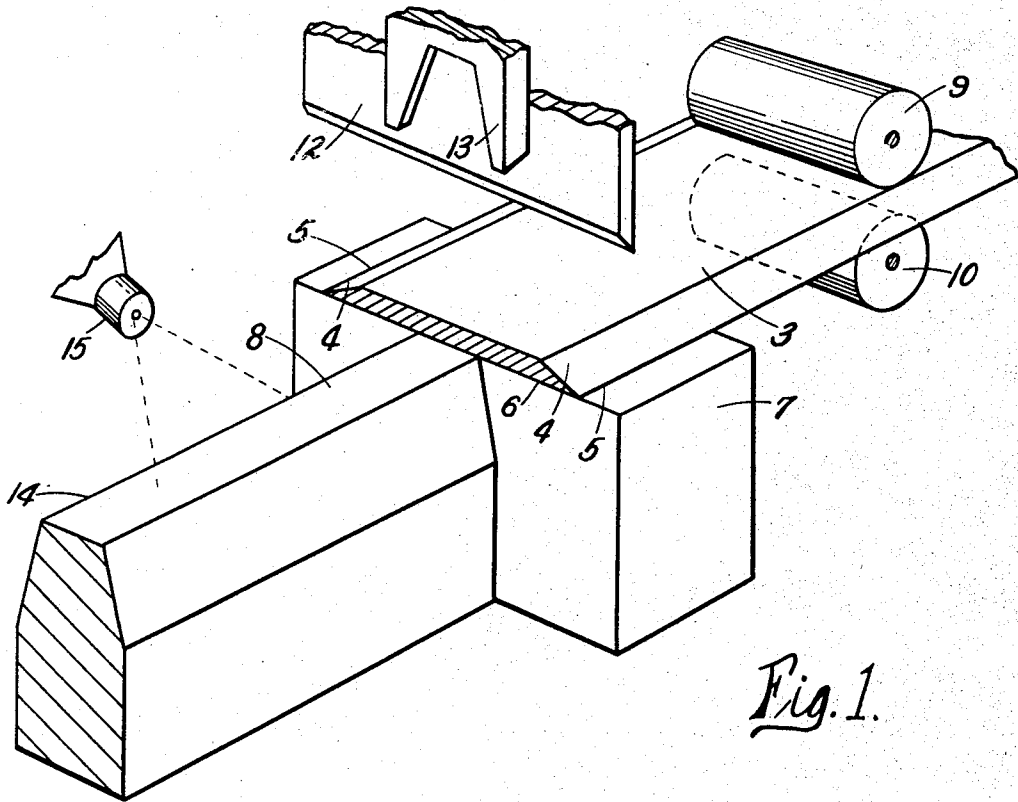


Fig. 1.

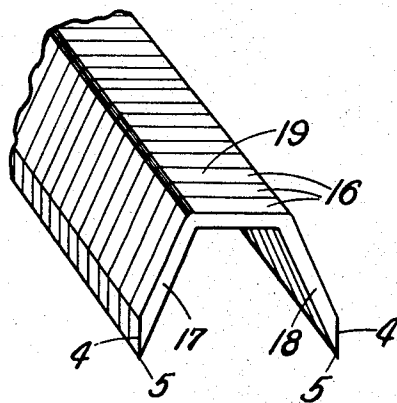


Fig. 2.

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METHOD OF MAKING STAPLES

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The present invention relates to a novel type of staple, and an improved and simplified method of manufacture.

An object of the invention is to provide a novel type of staple for clinching or securing purposes, wherein the legs of the staple are so formed as to curl or turn themselves inwardly toward each other when the staple is driven into a support or object, thereby to provide a very secure connection or joint.

Another object of the invention is to provide staples of such character as will readily assume a tandem relationship in the process of manufacture, thereby enabling and facilitating the application thereto of a binder substance which maintains the staples in group formations, and which group formations will nest so as to reduce packaging costs and the size of packages containing a given number of the staples.

Another object of the invention is to provide a novel method of manufacturing staples, which method employs the cheapest form of stock, namely, strip metal, and the simplest, least expensive and most dependable form of mechanism, the power press, in the performance of the method.

A further object of the invention is to reduce the cost and increase the speed of staple manufacture by the processing of strip material rather than wire.

The foregoing and other objects are attained by the means described herein and disclosed in the accompanying drawing, in which:

Fig. 1 is an enlarged perspective view of one form of mechanism for practicing the new method of the invention.

Fig. 2 is an enlarged perspective view of a group of novel staples resulting from the new method of manufacture.

Staples which have been in common usage heretofore were provided with spaced parallel legs, and were maintained in group formation by means of a binder of suitable character, such as compositions including a varnish, or a cellulosic substance. In the packaging of such staple groups or formations, it was necessary to provide compartments in the packages to separate the groups of staples in order that the package would maintain them in an orderly relationship. Due to the fact that the legs of the staples were parallel, it was not possible to nest the staple groups or formations, wherefore the packaging problem had to be solved by resorting to partitioned packages which necessitated expense in addition to the cost of the box or container in

which they were packed. By means of the present invention, the packaging problem was simplified and the size of the package for a given number of staples was materially reduced. Moreover, the added cost of partitions in the package has been eliminated, resulting in reducing the shipping weight and the storage space required for a given number of staples.

It may be noted as a fact that staples to be applied by machine, must necessarily be very uniform, as the majority of stapling difficulties are occasioned by non-uniformity in the length of the staple legs. Staples which have heretofore been manufactured from round wire were not easily rendered uniform in the cut-off operation because of the complexity of wire handling machinery and the natural wearing of the parts thereof. As is well known, wire handling machinery is very complicated in construction, and requires frequent adjustments and repairs. Moreover, such machinery is not as positive nor as fast as the type of mechanism used in practicing the method hereof.

With reference to the accompanying drawing, the character 3 represents a narrow ribbon of strip metal having its side edges rolled or otherwise formed to provide bevels or reduced portions 4 terminating in sharp knife edges 5 in the plane of the lower face 6 of the strip. This strip is adapted to be fed intermittently over the anvils 7 and 8 by the use of any suitable feed means, for example, power driven rollers 9 and 10. As the strip material is intermittently fed along the anvil 7, and for a short distance onto the anvil 8, the cut-off knife 12 descends to sever a short length from the strip and the forming die part 13 immediately follows the cutting off operation to make the severed portion conform with the upper die part 14 of anvil 8. It will be understood that the knife 12 and die 13 are operated independently so as to have relative movement such that advancement of the die 13 continues upon termination of the cut-off operation of knife 12. Upon completion of the forming operation, the parts 12 and 13 retract from the work and the retractile movement is followed by a slight advance of the strip 3 to a position at which its leading edge overhangs anvil 7 an amount equal to the desired width of the staple. Continued operations of the knife and forming die, and intermittent feeding of the strip material, results in the advancement of a succession of finished staples along the length of anvil 8. This anvil may extend for any desired distance, or it may lead the staples onto a suit-

able guide or carrier (not shown). During advancement of the finished staples in abutting succession, it is desirable to apply thereto a suitable binder for maintaining the staples in tandem formation, in which formation the staples may be handled and packaged. The mode of applying the binder is immaterial to the present invention, there being shown, however, a nozzle 15 for spraying onto the succession of staples any suitable binder such as varnish or cellulosic substance or other suitable composition. It is to be understood that the binder may be applied by advancing the succession of staples through a bath of binder substance, if desired.

It is to be understood that the cut off knife 12 and forming die 13 may be incorporated in a single die in accordance with common practice, and that means other than rollers 9 and 10 may be employed for the intermittent advancement of preformed strip 3 toward the die structure.

The representation of Fig. 2 shows a series of finished staples 16 joined together in the manner previously explained. It will be noted that the legs 17 and 18 of the staples extend downwardly and diverge outwardly from the head 19. The bevels or reduced portions 4 and the knife edges 5 originally provided on the strip 3, furnish the sharpened extremities of the staples, and each and every staple must necessarily have legs of uniform length because the preformed strip from which the staples are made has side edges which are parallel and uniformly spaced. The staple thus formed is adapted especially for inward turning of the legs thereof when driven into a support as the exterior opposed faces of the legs carry beveled portions which are quite large in area and substantially rectangular, whereby the planes of the beveled portions present a maximum area such as will assuredly guide the extremities of the legs inwardly toward one another when the staple is driven.

The staples are furnished to the consumer in the form disclosed by Fig. 2, with the legs of each set of staples nested between the legs of an adjacent set, so that a great number of staples may be included in a small package. The purchaser uses the staples in a stapling machine which bends the legs into parallelism prior to driving the staple into an object to be clinched or fastened. As the beveled portions 4 of each staple are directed inwardly toward the points

5 thereof, the staple when driven is obliged to turn its legs inwardly toward one another, thereby to provide a strong and dependable clinch. It will be found that the staples of the present invention may be driven into a board or other support of lesser thickness than the length of the legs 17 and 18, without having the legs penetrate the back of such board or support.

What is claimed is:

1. The method of staple manufacture which comprises the steps of first forming a long strip of material having parallel side edges chamfered to provide opposed sharpened edges, then intermittently feeding said strip lengthwise to a cutting and shaping mechanism which cuts off in succession short lengths of the strip and thereafter bends them to provide legs and a connecting head with the chamfered portions at the free ends of the legs.

2. The method of staple manufacture which comprises the steps of first forming a long strip of material having parallel side edges and a face beveled off toward each of said side edges, then intermittently feeding said strip to a cut-off means for determining the width of the staple head, subjecting the severed strip portions successively to a forming die which bends the strip to provide staple legs diverging outwardly from the head, and thereafter applying a binding substance to the succession of finished staples to temporarily maintain them in tandem relationship for packing and use.

3. The method of staple manufacture which comprises the step of first forming a long strip of material having parallel side edges and opposed faces, forming narrow bevels on one face only of said strip, each bevel extending to one of said side edges and providing a sharp straight line edge, then intermittently feeding said strip to a cut-off means for determining the width of the staple head, subjecting the severed strip portions successively to a forming die which bends the strip to provide staple legs diverging outwardly from the head, with the bevels disposed at a substantial distance from the head, and thereafter applying a binding substance to the succession of finished staples to temporarily maintain them in tandem relationship for packing and use.

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