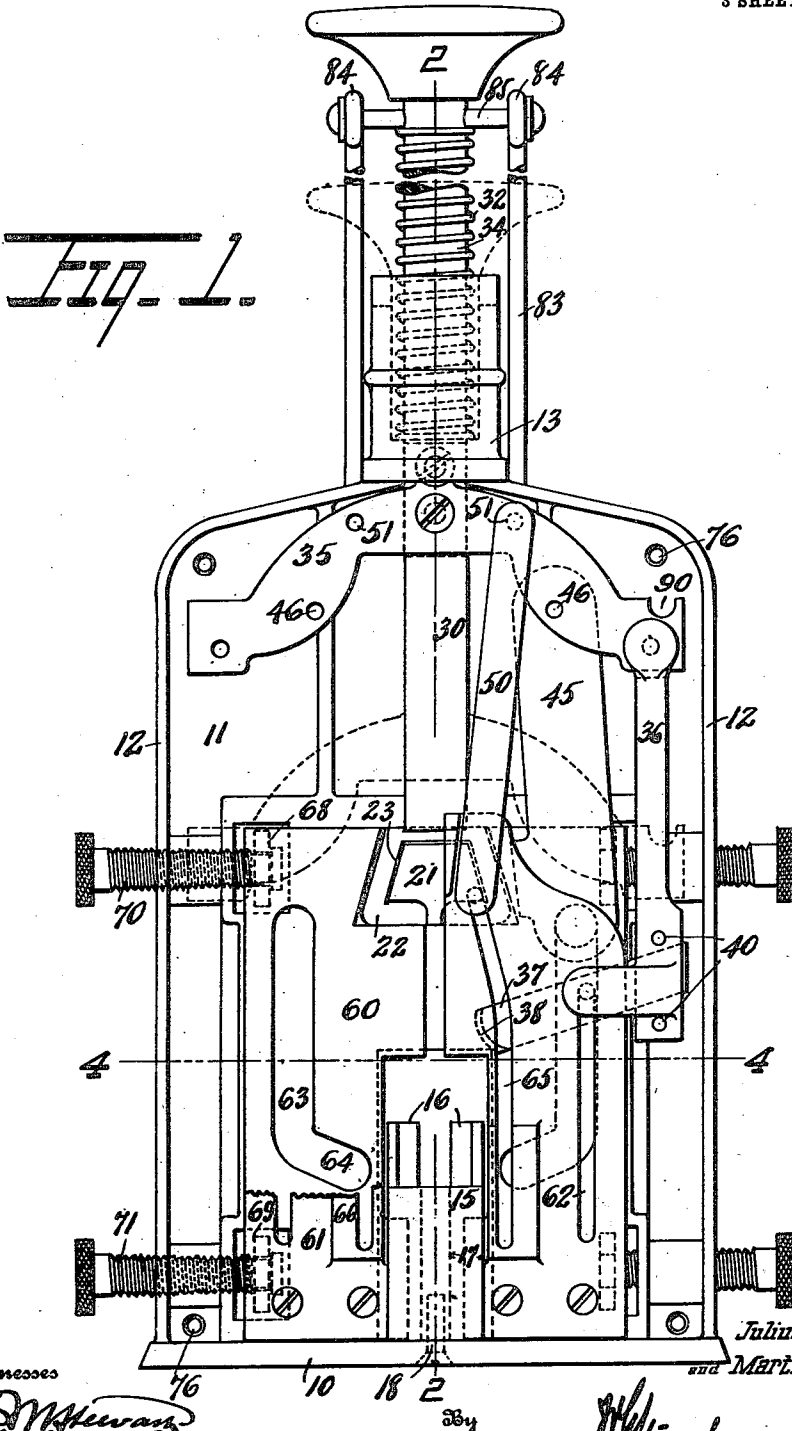


J. G. HANSEN & M. R. SCHAPPER.
CORK STAPLING MACHINE.
APPLICATION FILED JULY 6, 1911.

1,064,474.

Patented June 10, 1913.

3 SHEETS—SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

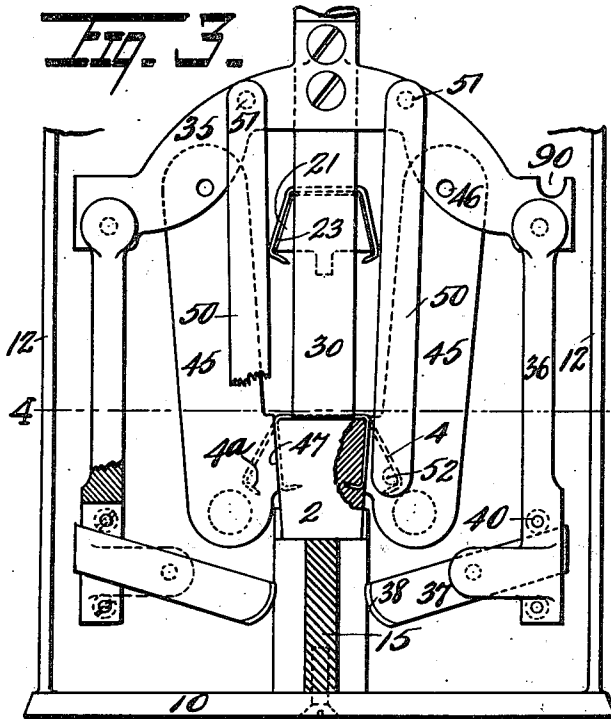


Fig. 5 Fig. 6

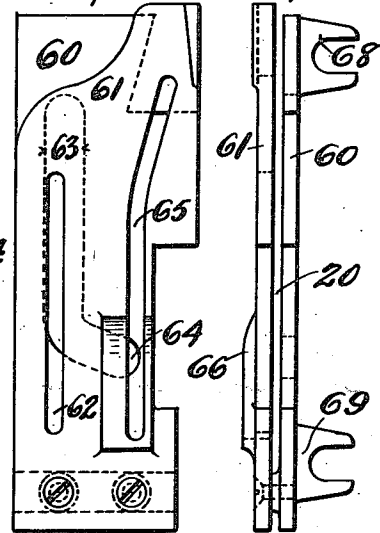


Fig. 4.

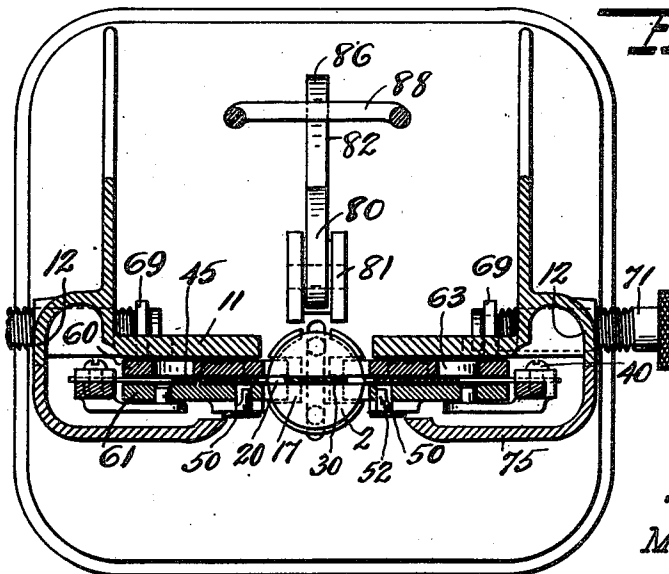
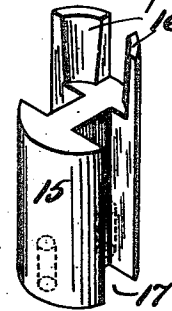


Fig. 7.



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384

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UNITED STATES PATENT OFFICE.

JULIUS G. HANSEN AND MARTIN R. SCHAFER, OF READING, PENNSYLVANIA.

CORK-STAPLING MACHINE.

1,064,474.

Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that we, JULIUS G. HANSEN and MARTIN R. SCHAFER, both citizens of the United States, and residents of the city of Reading, in the county of Berks and State of Pennsylvania, have invented certain new and useful Improvements in Cork-Stapling Machines, of which the following is a specification.

Our invention relates to a machine especially adapted for applying reinforcing staples to corks or bottle stoppers for the purpose of facilitating their withdrawal from bottles or the like.

The improved machine is fully described in connection with the accompanying drawings, and the novel features and combinations of parts, are definitely pointed out in the subjoined claims.

Figure 1 is a front elevation without the cover plate; certain of the parts being removed, and a portion of one of the outer guide plates being broken away to more clearly show the attached inner guide plate.

The parts are shown in normal starting position. Fig. 2 is mainly a central longitudinal section on the line 2—2 of Fig. 1, certain of the parts or portions thereof being shown full. Fig. 3 is a similar view to Fig. 1, but showing only the principal operating parts, and these in the position assumed at the finish of the stapling operation. Fig. 4 is a cross-sectional view on the line 4—4 of Figs. 1, 2 and 3; the moving parts being in the position indicated in Fig. 3. Figs. 5 and 6 are separate views of the combined guide plates, ready to be adjustably secured in the casing. Figs. 7 and 8 are additional views of machine details. Figs. 9 and 10

show the cork as cut preliminary to applying the staple; and Figs. 11 and 12 show the finished product, the partial cross-section shown in Fig. 11 being taken on the line 11—11 of Fig. 12. Fig. 13 is a separate view of the staple. Fig. 14 is an end view of the removable staple carrier.

The improved article of manufacture which is the particular product of our machine, comprises an ordinary cork 2, and a wire staple the legs 4, 4 and the inturned ends 4^a 4^a of which, are driven into the body of the cork, so as to rigidly unite it therewith and also serve as a convenient means for extracting the reinforced cork from the bottle. The staples are specially shaped to properly adapt them to the purpose, the legs

4, 4 being outwardly inclined as shown so as to spread the inturned ends and make practicable the required straddling of the cork; the angular bend of the inturned ends being such as to cause them to hook upward into the cork when driven into the latter. To enable the wire staple to be thus united with the cork material in a satisfactory manner, we have also found it to be practically essential that the surface material of the cork be preliminarily cut as indicated at 5, 5, so as to permit of properly embedding the longitudinally arranged staple legs without unduly straining or distorting the cork; and that these cuts, or severings of the surface material, should preferably be parallel and arranged to gradually run out at terminal points 6, 6 located well above the base of the cork and approximately where the right-angled ends 4^a 4^a of the staple are adapted to pass radially into the cork in thereafter securing the staple to the latter. When thus driven into the properly cut cork, the staple-wire is very firmly held and satisfactorily covered by the cork, while the latter is free from undue strains, and is capable of being withdrawn without injury by any convenient means applied to the cross bar of the staple.

In order that the improved article described may be produced with such nicety and economy as are practically essential commercially, it is necessary to provide that the several operations or steps incident thereto be automatically effected in their proper sequence and time; and we will now specifically describe the machine which we have invented and developed for such purpose, as shown in the drawings.

The machine casing comprises a base portion 10 carrying a vertical wall plate 11 which is provided with forwardly projecting marginal flanges 12, and with a plunger head 13. Upon the base 10 is provided a supporting block or anvil 15 for the cork 2; said block having suitable cork supporting posts 16, rising above its top face; being provided with oppositely arranged longitudinal grooves 17 for engaging the guide plates hereinafter described; and being secured to the base 10 by slot-engaged screws 18 as shown, so as to permit of its being readily adjusted for the purpose of accurately positioning corks of one size or another to the plane 20 of the staple guide-way.

The staples which are to be applied to the

corks so placed, are carried upon a horizontal feed bracket 21 which extends rearwardly from the casing wall 11; said wall being provided with an opening 22 for the inner end of the feed bracket and for the passage of the staples therethrough to the guide way and operating plane 20. Instead of placing the staples directly upon this feed bracket they are preferably strung upon a separate sheet-metal carrier 23 in connection with which they are supplied to the machine user; said carrier being slipped upon the feed bracket 21, and firmly held thereon, as shown, by a tongue 24 which is fixed at one end to the bracket and the free portion of which engages down-turned loops 25 of the carrier. The string of staples is pressed toward the guide-way 20 of the casing by a pusher 26 slidable on said carrier by the action of a spring band 27 or the like; the forward staple being thus moved into said guide-way 20 at the end of each upward movement of the central staple-driver 30 hereinafter described. This central staple-driver 30 is carried by an operating plunger 31, which is guided in the plunger-head 13 and normally raised by a spring 32. The operating downward movement of the plunger is effected either by hand as provided for in the construction indicated, or otherwise as desired; a regular power movement being of course preferable when convenient, thereby leaving the operator free to merely supply new corks and replace the staple-feed carrier when required. This plunger 31 not only carries the central staple-driver 30 but also a series of cooperating devices, being provided with a rigid cross-yoke 35, as shown, to which said devices are attached, in pairs, at opposite sides of the central driver 30. Referring particularly to Fig. 3 where they are shown as pivotally carried by the cross-yoke 35, without indicating the guiding means which control their movements, these devices comprise the following: First, attached to the outer ends of the yoke, are knife hangers 36, at the lower ends of which are adjustably secured knife blades 37 the curved cutting edges 38 of which are adapted to smoothly make the longitudinal cuts 5 in the corks; as shown the blades are adjustable in the lower ends of the hangers so that they can be swung upward or downward to determined operating positions, and are locked in such position by a suitable clamping plate and set screws 40. Second, there are side-driver hangers 45, pivoted at 46, 46 to the yoke 35, and having their lower ends provided with driver faces 47 adapted to operate upon the staple-legs 4 to press them into the longitudinal cuts 5 in the cork. Third, the staple-engaging hangers 50, which are pivoted at 51, 51 to the yoke, are provided at their lower ends with fin-

ger-pins 52 which are shaped to engage the corners of the inwardly-bent staple-legs; said hangers serving to positively hold and control each staple during its whole downward movement, and thereafter releasing the same to the free action of the side drivers; and also serving as shown, to spread the legs of the descending staple sufficiently to insure the inturned ends, 4^a, clearing the top portion of the cork as they are moved downward to closing-together position on the latter. The described actions of the several devices thus carried by the plunger 31, are automatically effected in proper sequence and coöperation, during the descent of the plunger, by guiding means adapted to properly engage and control the same, as will now be explained. These guiding means comprise connected inner and outer plates 60 and 61 on each side of the axis of the machine; said plates in each case being spaced apart to provide for the free movement of a knife 37 and side driver 45—47 in the plane of the guide-way 20, and being provided with guide slots to control the respective movements as desired. Thus each knife 37 is guided vertically in a straight slot 62 in each outer plate 61, and each side driver 45—47 is guided in a slot 63 in the inner plate 60; the lower end 64 of said slot 63, being sharply inclined toward the central axis so as to cause the driver to force the staple leg 4 into the cork. Each outer guide plate 61 is also provided with an additional slot 65 in which the finger-pin 52 of the corresponding staple engaging hanger 50 is guided; said slot 65 being outwardly deflected intermediate of its length, to provide for spreading the staple legs 4 as already described; and the front face of the plate 61 having a cam-like projection 66 at the margin of the lower portion of the slot 65, by which the hanger 50 is moved forward so as to disengage its finger-pin 52 from the staple-leg before the side-driver 47 operates to close together the staple legs.

The combined side-plates 60 and 61, are adapted to be jointly adjusted laterally in the casing, so as to move the controlling guide slots thereof inward or outward as required to suit one or another size of cork which is to be operated upon, thus conveniently adapting the machine to operate satisfactorily upon a certain range of sizes instead of a single size only. This adjustment is provided for as shown, by forming rearwardly projecting top and bottom lugs 68, 69 on the inner plate 60, which are engaged by adjusting screws 70, 71 extending through the casing flanges 12 and conveniently accessible to the operator. The combined plates, as well as the other interior parts of the machine, are properly held in place between the rear wall 11 of the casing

and the removable front wall 75 thereof, by providing the inner faces of both walls with suitable bearings therefor which retain the parts in determined position when the removable front wall or cover-plate 75 is secured to the main casing by suitable screws at 76.

In order to automatically discharge the corks from the machine, immediately after each stapling operation is completed, we provide a discharging hammer 80 in the form of a bell-crank; said hammer being pivoted at 81, near the base of the casing, and having a trigger arm 82 which rests upon said base when the hammer is withdrawn. This hammer is automatically operated to discharge a cork after the completion of each downward movement of the plunger, by means of a looped operating rod 83; the upper ends 84 of said rod being pivotally connected to a cross-pin 85 in the upper portion of said plunger, while the looped lower end 88 is adapted to engage the trigger-arm 82 at the finish of the plunger stroke. This engagement is positively insured by forming the trigger arm 82 with a hooked end 86 having a curved upper surface on which the loop 88 of the descending connecting rod 83 rides outward, springing the rod from the intermediate fixed guide 87, until the loop is free to get under the trigger arm as clearly shown in Fig. 2. The first rising movement of the plunger then swings the discharging hammer to the position indicated in dotted lines, thereby discharging the stapled cork; after which the hammer returns to its normal position and is ready for the succeeding operation.

The ends of the central staple driver 30 and right and left drivers 47, are properly grooved, as indicated, so as to snugly engage the staple wire on which they operate. The notch 90 shown in the yoke 35, is provided to engage a locking hook, not shown, whereby the plunger and connected parts may be firmly held in lowered position, as for shipping. These and other features of minor importance may obviously be omitted without affecting the essential operation of the machine, and the particular construction and arrangement of the main features as specifically described, may be readily modified without materially changing such operation, which may be briefly restated as follows: The cork being placed in position upon the properly fixed anvil block, and the charged staple-feed carrier 23 having been secured on the feed bracket 21, a single downward movement of the plunger 31 and its attached devices effects all the required operations in proper succession and cooperation: The finger-pins 52 of the hangers 50, which engage the bent ends of the staple pushed forward into the guide-way plane 20, positively control the staple during its

downward movement, spreading the legs 4, 4 before they reach the top of the cork, and releasing them when they are in position to be driven into it. The knives 37, which are in advance of the staple, have meanwhile made the clean parallel cuts 5, 5 in the surface of the cork. The right and left side drivers 47, 47 which have been lowered to proper positions, are closed together to drive the staple legs into the cuts 5, 5 and their bent ends into the solid body of the cork adjacent the ends of the cuts 5 and with a slight upward slant as indicated. As the plunger is released after the completion of these operations, the discharging hammer 80, which has been engaged by the looped connecting rod 83, is thrown forward to discharge the stapled cork and then returns to normal position. As the central driver 30 rises above the inner end of the feed bracket 21 a new staple is pushed forward into the guide-way plane 20 and the machine is ready for a repetition of the described operations.

What we claim is:—

1. In a cork stapling machine having a cork support and a staple guide-way, vertically moving knives, a vertically moving central driver, and side drivers, all coöperatively arranged in the plane of said guide-way.
2. In a cork stapling machine having a cork support and a staple guide-way, a plunger, and a central driver, vertically guided knives, and laterally swung side drivers, all carried by said plunger and coöperatively arranged in the plane of said guide-way.
3. In a cork-stapling machine having a cork support and a staple guide-way, a plunger, a central driver fixedly secured thereto and side drivers pivotally carried thereby all arranged in the plane of said guide-way, and fixed means for closing together said pivoted side drivers during a determined portion of the plunger movement.
4. In a cord stapling machine having a cork support, a central staple guide-way, and side-driver guide-ways; a plunger, and a central driver and pivoted side drivers all carried by said plunger and arranged in the plane of said staple guide-way; the free ends of said pivoted side drivers being engaged in their respective guide-ways and the end portions of the latter being inclined toward the axis of the plunger.
5. In a cork stapling machine having a cork support and a staple guide-way, a plunger carrying a central driver and side knives, all arranged in the plane of said guide-way, and side drivers also arranged in said plane and adapted to be operated by said plunger.
6. In a cork stapling machine having a cork support and a staple guide-way, a plunger carrying a central driver and side knives, all arranged in the plane of said guide-way,

side drivers also arranged in said plane, and means for closing together said side drivers after said knives have operated.

7. In a cork stapling machine having a cork support and staple guide-way, a plunger carrying a central driver and side knives, all arranged in the plane of said guide-way, side drivers pivotally carried by said plunger and also arranged in said plane, and means for closing together said side drivers after said knives have operated.

8. In a cork stapling machine having a cork support and staple guide-way, a plunger carrying a central driver and side knives, all arranged in the plane of said guide-way, side drivers pivotally carried by said plunger and also arranged in said plane, and means for closing together said side drivers during the final movement of the plunger.

9. In a cork stapling machine having a staple guide-way, central and side drivers, and an operating plunger, staple-engaging fingers, and means for spreading the same during the plunger movement.

10. In a cork stapling machine having a staple guide-way, central and side drivers, and an operating plunger, staple-engaging fingers, and means for spreading the same during the preliminary plunger movement, and thereafter moving them out of the plane of said guide-way.

11. In a cork stapling machine having a staple guide-way, central and side drivers, and an operating plunger, staple-engaging fingers pivotally carried by said plunger, and means for spreading the same during the plunger movement.

12. In a cork stapling machine having a staple guide-way, central and side drivers, and an operating plunger, staple-engaging fingers pivotally carried by said plunger, and means for spreading the same during the preliminary plunger movement and thereafter moving them out of the plane of said guide-way.

13. In a cork stapling machine having a staple guide-way, a plunger; a central driver, side drivers, knives, and staple-engaging fingers all carried by said plunger; and fixed means for controlling the coöperative movements of said parts during the plunger movement.

14. In a cork stapling machine having cork supporting means; staple guiding means, cork-cutting knives, and staple driving means operating vertically and laterally in the same plane as said knives.

15. In a cork stapling machine having a central guide-way, and a plunger carrying operating devices on each side of said guide-way; controlling means for said drivers each comprising spaced-apart guide plates provided respectively with guide-ways engaging said devices.

16. In a cork stapling machine having a

central guide-way, and a plunger carrying operating devices on each side of said guide-way; controlling means for said devices each comprising combined spaced-apart guide-plates provided respectively with guide-ways engaging said devices; and means for removably securing said combined guide-plates.

17. In a cork stapling machine having a central guide-way, and a plunger carrying operating devices on each side of said guide-way; controlling means for said devices each comprising combined spaced-apart guide-plates provided respectively with guide-ways engaging said devices; and means for adjustably securing said combined guide-plates.

18. In a cork stapling machine having a central guide-way, an adjustable cork support, and a plunger carrying operating devices on each side of said guide-way; controlling means for said devices on each side of said guide-way, and means for adjusting said controlling means in directions at right angles to the adjusting movement of said cork support.

19. In a cork stapling machine the combination with a cork support, of means for longitudinally slitting said cork comprising a plunger, a pair of hangers carried thereby, knives adjustably secured in said hangers, and guiding means for said hangers.

20. In a cork stapling machine the combination with staple guiding means, of staple driving means comprising a plunger, a pair of side-driver hangers pivotally carried thereby the free-end portions of which are provided with opposed driver faces, and guiding means for said hangers adapted to impart a closing-together movement to said opposed driver faces.

21. In a cork stapling machine the combination with a staple guide-way, of staple controlling means comprising a plunger, a pair of hangers carried thereby and provided with staple-leg engaging fingers, and guiding means for said hangers adapted to impart a spreading movement thereto.

22. In a cork stapling machine the combination with a staple guide-way, of staple controlling means comprising a plunger, a pair of hangers carried thereby and provided with staple-leg engaging fingers, and guiding means for said hangers adapted to impart thereto first a spreading movement, and thereafter a staple-releasing movement.

23. In a cork stapling machine, the combination with a cork support, and staple guiding and driving means, of an operating plunger, a cork discharging hammer movably mounted adjacent said support, and a hammer-operating rod carried by said plunger and arranged to automatically engage and disengage said hammer.

24. In a cork stapling machine, the com-

5 combination with a cork support, and staple
guiding and driving means, of an operating
plunger, a pivoted bell-crank having a cork-
discharging hammer arm, and a hammer-
operating rod pivotally carried by said
plunger and arranged to automatically en-
gage and disengage said bell-crank.

10 25. In combination with a stapling ma-
chine having a staple guide-way, staple-
driving means, and a casing wall provided
with a staple-feed opening and a fixed feed-
bracket arranged at right angles to said
guide-way, a separate sheet-metal staple car-
rier removably secured to said bracket.

15 26. In combination with a stapling ma-

chine having a staple guide-way, staple-
driving means, and a casing wall provided
with a staple-feed opening and a fixed feed-
bracket arranged at right angles to said
guide-way, a separate sheet-metal staple car- 20
rier removably securable to said bracket, and
a spring-pressed staple-pusher slidably
mounted on said removable carrier.

In testimony whereof, we affix our signa-
tures, in the presence of two witnesses.

JULIUS G. HANSEN.

MARTIN R. SCHAFER.

Witnesses:

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W. G. STEWART.