

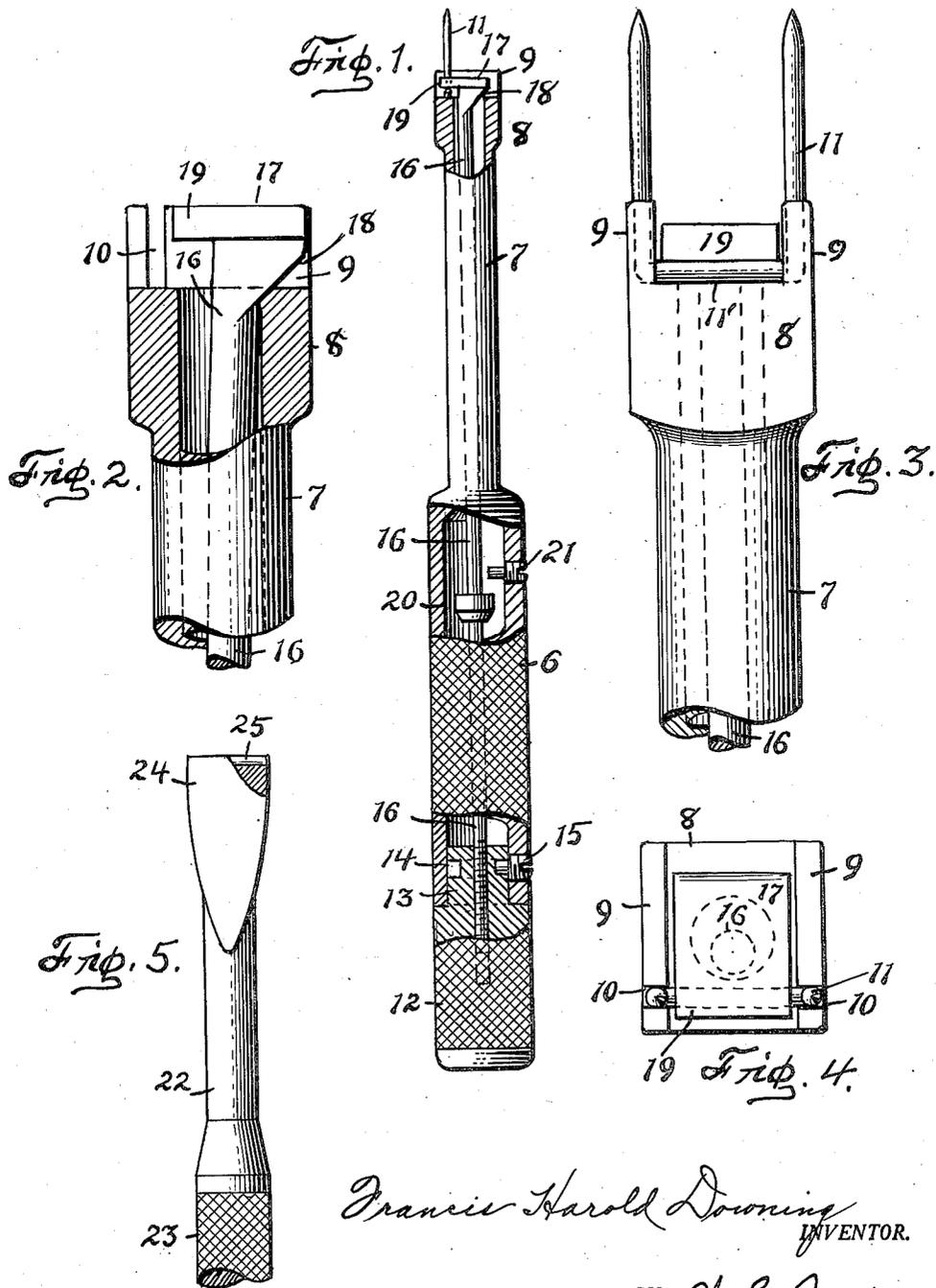
March 6, 1951

F. H. DOWNING

2,544,492

STAPLE HOLDER

Filed March 20, 1947



Francis Harold Downing
INVENTOR.

BY *H. G. Burns*
Attorney

UNITED STATES PATENT OFFICE

2,544,492

STAPLE HOLDER

Francis Harold Downing, Fresno, Calif.

Application March 20, 1947, Serial No. 735,936

4 Claims. (Cl. 1—50)

1

This invention relates to improvements in a staple-holder for emplacement of staples, adaptable in capsulorrhaphy relating to recurrent dislocation of the shoulder, or where it is beneficial to establish substantial connection between, or relative fixation of, bones and soft tissues of the anatomical structures.

An object of the instant invention is to simplify the customary surgical operation in such instances and establish a more substantial and permanent connection between the parts involved.

Another object of the invention is to provide an instrument in which a staple is removably secured rigidly in a definite position to facilitate initial emplacement of the staple in the parts to be connected.

Other objects and advantages of the invention appear in the following description.

An illustrative embodiment of the invention is shown in the accompanying drawings, in which:

Fig. 1 is an elevational view of a structure in which the invention is incorporated, portions thereof being broken away to disclose concealed parts;

Fig. 2 is a fragmentary elevational view of the structure showing the chuck in which a staple is removably secured;

Fig. 3 is another elevational view of the chuck shown in Fig. 2 in a plane at right angles thereto and including a staple secured therein;

Fig. 4 is a top plan view projected from Fig. 3; and

Fig. 5 is a fragmentary elevational view of a tool for setting the staple after the staple has been initially emplaced.

The illustrative embodiment of the invention consists of a tubular handle 6 having a shank 7 the distal end of which has an enlargement constituting a head 8 provided with an upstanding flange 9 on each side thereof, there being aligned vertical slots 10 in said flanges for the reception of the tines of a staple 11.

A hand piece 12 is mounted in connection with the lower end of the handle 6 provided with a neck 13 that fits loosely within the bore of the handle, there being an annular groove 14 in the neck for the reception of the projecting end of a stop-screw 15 located in the handle whereby axial movement of the hand piece relative to the handle is prevented.

A rod 16 is disposed loosely within the bore of the handle and shank, the lower end of which has threaded connection with the hand piece 12, so that by turning of the hand piece the rod is ad-

2

justed vertically. The upper end of said rod has thereon a grip member 17 provided with a slanting cam-face 18 at its rear end that has sliding movement on the upper end of the head 8, and at its opposite end an overhanging jaw 19. The grip member is disposed loosely between the side flanges 9 and has vertical movement therebetween accordingly as the rod 16 is adjusted. Turning of the rod is prevented by contact of the grip member with the side flanges of the head.

Upon the rod is secured a collar 20, located within the bore of the handle, and is engaged by a second stop-screw 21 in the handle that projects into the path of the collar so that upward movement of the rod is thereby limited which prevents removal of the grip member from between the flanges 9. The rod 16 is slightly bowed so the cam-face 18 is held constantly against the adjacent inner wall of the head 8 opposite the slots 10. Thus, when the grip member is in uppermost position the overhanging jaw 19 is then disposed back from the slots which permits the staple to be inserted in position. The rod 16 is swayed forwardly upon downward adjustment thereof, due to the action of the cam-face 18, thus causing the overhanging jaw 19 to move forwardly between the slots and over the back 11' of the staple and clamp the staple rigidly in place.

The head 8 together with its slotted flanges 9, and the grip member 17 with its cam-face 18 and overhanging jaw 19, constitute a chuck for holding the staple during the operations of driving the staple into the parts to be connected or retracting it therefrom.

Operation

In using the invention, the grip member is raised to its open position by manipulating the hand-piece 12, after which the staple is placed with its back resting on top of the head 8 and with its tines extending upwardly in the corresponding slots 10, and then moving the grip member down by reversely manipulating the hand piece, whereupon the jaw 19 overhangs the back 11' of the staple and clamps it against the head. The anatomical parts to be secured by the staple are first exposed by customary open surgery to permit location and adjustment thereof into proper positions. The staple, while secured in the instrument, is then applied to said parts by maneuvering the handle so the points of the tines initially rest against the parts and with the tines extending in a selected direction. Force is then applied by striking the instrument repeatedly with a mallet until the staple is driven

3

partway into place. At this stage of the operation, if upon inspection it is discovered the emplacement is in need of correction, the staple is withdrawn by pulling the instrument outwardly, after which the staple is reinserted in a better position. The instrument is then unclamped from the staple, and a suitable setting tool is then applied with the use of a mallet to drive the staple home. Such setting tool preferably is of the structure shown in Fig. 5, and consists of a shaft 22 provided with a handle 23 and a blade 24 having a channel 25 in its upper end for reception of the back of the staple.

An especial advantage of the invention is that the chuck and its adjusting means are such as to permit placing of the staple in operative position and disconnection of the instrument from the staple with dispatch which is of prime importance especially in surgery.

Variations from the particular construction above disclosed may be resorted to by the exercise of skill in the art, without departure from the spirit or scope of the invention.

What I claim is:

1. An instrument for use in driving staples consisting of a tubular handle having a shank provided with an enlarged outer end constituting a head, parallel side flanges on said head spaced apart, a rotatable hand piece secured in connection with said handle at the end thereof opposite said head, a rod extending loosely through the bore of the handle having threaded connection with said hand piece, and a jaw on said rod at its outer end disposed between said flanges and having a slanting cam-face that bears against said head to cause swaying movement of the rod, said jaw being disposed oppositely with respect to said cam-face, and adapted to engage and secure in place a staple disposed on said head with its tines in the flange slots.

2. An instrument for use when inserting staples consisting of a tubular handle having at one end a head and at its opposite end a rotatable hand piece, a jaw provided with an operating rod axially and loosely extending through the bore of the handle and has threaded engagement with

4

said hand piece whereby to adjust said jaw relative to said head, said head having upwardly projecting side flanges between which said jaw is loosely confined, and a stop in said handle engageable with a collar on said rod to limit axial movement of the rod, said jaw having a slanting cam-face that bears against said head whereby to move the jaw into or out of clamping engagement with a staple positioned in said flanges accordingly as said rod is adjusted.

3. A staple holder consisting of a tubular handle having on one end thereof a head in which to removably position a staple, a grip member having a cam face movably disposed in said head and provided with an operating rod therefor disposed loosely within the bore of said handle, and a rotatable handpiece in connection with the lower end of the handle and threaded on said operating rod by which to manipulate the rod and cause movement of said cam face against said head and engagement of said gripping member with a staple disposed in said head.

4. An instrument for use when inserting staples, said instrument consisting of a tubular handle having on one end thereof a staple-holding head, a rotatable hand-piece in connection with the other end of said handle, a jaw movably disposed in said head and provided with an operating rod therefor disposed loosely within the bore of said handle and having threaded connection with said hand-piece by which the rod is axially adjusted, said jaw having a cam face engaging said head whereby the jaw is moved into staple-clamping or releasing positions accordingly as said hand-piece is manipulated.

FRANCIS HAROLD DOWNING.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,539,221	Tennant	May 26, 1925
1,631,510	Barrett	June 7, 1927
2,121,682	Boucher	June 21, 1938