

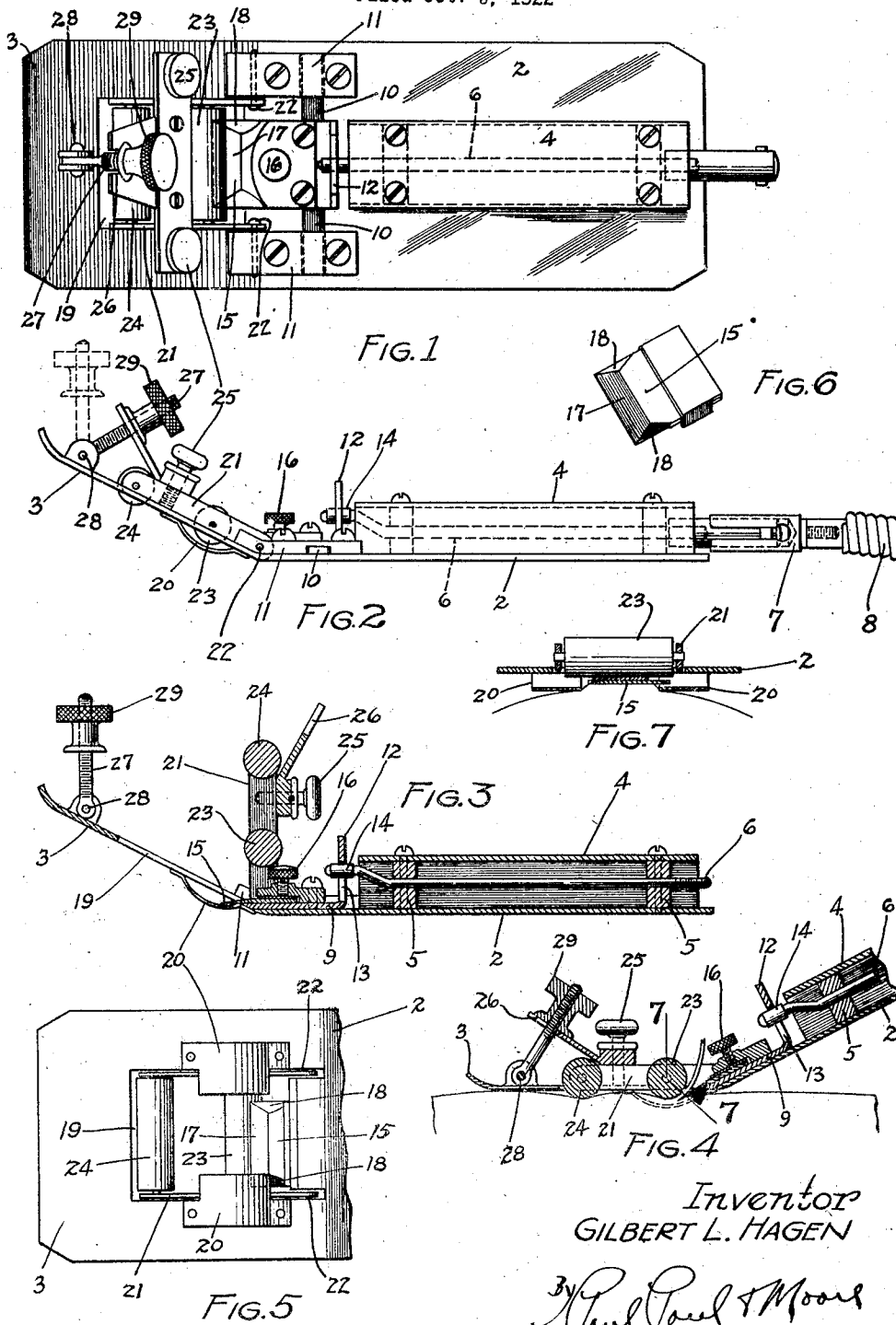
Aug. 3, 1926.

1,594,613

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DERMATOME

Filed Oct. 5, 1922



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Patented Aug. 3, 1926.

1,594,613

UNITED STATES PATENT OFFICE.

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DERMATOME.

Application filed October 5, 1922. Serial No. 592,648.

In the surgical operation of transplanting skin from one person to another, it has been customary to use a razor for cutting the skin from the donor, and difficulty is experienced in cutting it of uniform thickness; the razor blade having a tendency to turn in the hand and cut deeper in one place than in another.

It is desirable that the transplanting operation be performed without causing flow of blood from the donor, and this can hardly be avoided when a razor is used, and uneven cuts are made in the flesh.

The object of my invention, therefore, is to provide an instrument by means of which a thin shaving of flesh may be removed of the desired thickness with provision to prevent accidental deep cutting and the consequent flow of blood.

A further object is to provide an instrument by means of which flesh can be cut and transplanted much quicker than by the ordinary methods heretofore employed.

The invention consists generally in various constructions and combinations all as herein after described and pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a plan view of a dermatome embodying my invention;

Figure 2 is an edge view of the same;

Figure 3 is a sectional view showing the operating means for the flesh-cutting knife;

Figure 4 is a detail sectional view showing the position of the instrument when in use;

Figure 5 is a bottom view showing the position of the knife and guards;

Figure 6 is a detail view showing the preferred form of knife used with the instrument;

Figure 7 is a detail sectional view on the line 7-7 of Figure 4.

In the drawing, 2 represents the frame of the instrument consisting preferably of a flat plate of metal having an upwardly turned end 3. On the upper side of this plate, the operating mechanism of the instrument is mounted. A housing 4 is mounted midway on the top of the plate, and has bearings 5 therein for a crank-shaft 6, which has a coupling 7 at one end connected with a flexible shaft 8 extending to a suitable source of power, such as a hand-operated crank or a motor. (Not shown.)

It will be understood that any suitable mechanism may be employed for operating the knife. A hand-operated crank and

wheel, however, connected to the flexible shaft is a convenient means for operation.

A plate 9 is seated on the forward portion of the plate 2 and has extensions 10 adapted to slide laterally in guides 11 on each side of said plate, and the plate 9 has an upwardly turned rear portion 12 provided with a vertical slot 13 to receive the crank 14 on the forward end of the crank-shaft 6 so that when said shaft is revolved, the plate 9 will be reciprocated between the guides 11. A knife 15 is seated on the plate 9 and secured by suitable means such as a set screw 16. This knife has a forward cutting edge 17 and side cutting edges 18, so that it will cut the flesh in its forward movement as the instrument is fed, and will also cut the flesh as it reciprocates laterally; the forward movement being of course imparted by the operator holding the instrument on the surface from which the flesh is to be removed.

The knife operates through an opening 19 in the upwardly turned end 3 of the plate 2, and upon opposite sides of this opening I provide curved guard plates 20 which rest upon the surface of the skin and tend to bulge up the flesh between the guards near and where it can be readily reached by the knife blade to make a clean cut. The reciprocation of the knife blade is over these guard plates, back and forth from one side of the opening 19 to the other.

A frame 21 is hinged at 22 upon opposite sides of the knife blade and adapted to swing to a position over the opening 19. In this frame, rollers 23 and 24 are mounted; the roller 23 being adjacent the knife blade and forming a guide, therefore limiting the depth of cut, and the roller 24 projecting through the opening 19 and rolling on the flesh ahead of and remote from the knife, and tending to keep the flesh flat so that the knife will cut a uniform depth therein.

Adjusting screws 25, I provide on each side of the frame for contact with the end 3 to regulate the position of the rollers with respect to the knife and the opening 19; and a slot 26 is provided in said frame to receive a screw 27 that is pivoted at 28 and provided with an adjustable thumb nut 29 by means of which the frame may be locked in its adjusted position.

In using the instrument, the frame 21 is adjusted so that the rollers are at the desired relative position with respect to the opening 19, and the roller 23 is the desired

distance from the knife edge to obtain the proper depth of cut. Then when power is applied to the crank-shaft, the knife blade will be reciprocated in its guides and forward movement of the instrument over the flesh will cut a strip of uniform depth throughout the cutting operation. This depth may of course be varied by the adjustment of the rollers, the pressure of which on the skin surface will hold it flat and prevent bunching and insure a uniform cut of the knife. The lateral reciprocation of the knife will cut the flesh on each side, while the forward movement of the instrument will bring the forward cutting edge in position and hold it continually to the work.

I claim as my invention:

1. An instrument of the class described comprising a suitable frame, a flesh cutting knife mounted therein having forward and side cutting edges adapted to cut the flesh as said frame is moved forward, means for operating said knife laterally to engage its side cutting edges with the flesh during the forward movement of said knife, and means for holding the flesh in position to be cut by said knife.

2. An instrument of the class described comprising a frame, a knife mounted therein having forward and side flesh cutting edges, guards having curved surfaces to bear upon the flesh and position it to be cut by said edges and a roller above said knife and guards and adjacent thereto.

3. An instrument of the class described, comprising a frame, a knife mounted to reciprocate therein, guards adapted to bear on the flesh below said knife, a roller above said knife and guards adjacent thereto, and a second roller in advance of said first-named roller.

4. An instrument of the class described comprising a frame, a knife mounted to reciprocate therein, guards below said knife for bulging the flesh between the guards in the path of the knife, a roller mounted above said knife and adjacent thereto, to regulate the depth of cut and means for adjusting said roller to increase or decrease the distance between it and the cutting edge of said knife.

5. An instrument of the class described comprising a frame, a knife mounted to re-

ciprocate laterally therein, guards below said knife to bear upon the flesh, a pivoted frame, rollers mounted in said frame to bear upon the flesh above the cutting edge of said knife, and means for adjusting said frame to vary the relative position of said rollers and said knife.

6. An instrument of the class described comprising a frame, a knife blade having substantially straight forward and side cutting edges adapted to cut the flesh upon each side adjacent said edges, and means for reciprocating said blade in said frame to engage its side cutting edges with the flesh as said frame is moved forward to engage the forward edge of said blade with the flesh.

7. An instrument of the class described comprising a frame having an upwardly turned forward portion provided with an opening, a plate mounted to reciprocate laterally over said opening, means for operating said plate, a knife blade having forward and side cutting edges mounted in said plate and operating through the opening in said frame, and means in front of said knife in said opening for limiting the depth of cut and preventing the flesh from bulging in front of the knife.

8. An instrument of the class described comprising a frame, a knife having forward and side cutting edges mounted to reciprocate laterally in said frame, rollers mounted in front of said knife, one roller being adjacent the forward cutting edge of the knife to limit the depth of cut, and the other roller operating in advance of the first-named roller to keep the flesh flat in front of the knife.

9. An instrument of the class described comprising a frame adapted to be held in the hand and pushed forward over the flesh, a knife mounted in said frame and having forward and side flesh cutting edges at right angles substantially to one another, means for moving said knife laterally to engage its side cutting edges with the flesh, the forward movement of said frame engaging the forward edge of said knife with the flesh, and the lateral movement engaging said side cutting edges.

In witness whereof, I have hereunto set my hand this 30th day of September, 1922.

GILBERT L. HAGEN, M. D.