The invention relates to razors of the magazine type — i.e., razors provided with a magazine containing blades, which may be fed one by one as needed into a shaving head.

The principal object is a razor of this type that will be of simple construction and capable of being operated with a simple and cheap pack of blades.

Another object is a razor of the said type so constructed that the introduction of a blade pack into the magazine is a simple operation even to the uninitiated user.

Describing the drawing,

Fig. 1 is a view in elevation and in longitudinal section showing the razor with a stack of blades located therein;

Fig. 2 is an isometric view of a preferred form of blade;

Fig. 2a is a longitudinal view in section of the blade of Fig. 2;

Fig. 3 is an isometric view of a pack of blades of the construction shown in Fig. 2;

Fig. 4 is a view in elevation and in longitudinal section and inverted from the position shown in Fig. 1 and showing a blade pack in position for inserting the stack in the razor;

Fig. 5 is a view similar to Fig. 4 but showing the stack located in the razor;

Fig. 6 is a view on the line 6—6 of Fig. 5;

Fig. 7 is a view on the line 7—7 of Fig. 1;

Fig. 8 is a view in cross section of a blade pack employing a modified form of clip, and

Fig. 9 is a horizontal view showing the details of the retaining member for limiting the receding motion of the plunger.

Referring more in detail to the drawing, a form of blade suitable for use in the razor and for assembly into a blade pack that may be used in the razor is illustrated in Fig. 2, being indicated as a whole by the numeral 10, the cutting edge being indicated by the numeral 11. The blade is provided on one face with two indentations 12 and 13 and on the opposite face with two nubs 14 and 15. The indentations may be produced by punching, which at the same time forms the nubs so that to each indentation there is a nub on the opposite side of the blade similarly positioned. The blades may therefore be stacked so that the nubs of each blade nest in and engage mating indentations in a contiguous blade, and thus the stack takes the form of a rectangular parallelepipedon with the edges of the blades all on one side. For convenience in the punching operation and to adapt the indentations and nubs for co-engagement, the contour of each indentation approximately conform to that of the surface of a cone, thus in each case producing shoulders 16, 17 of the nubs at a contour similar to that of the indentations, and thus there are produced shoulders 17, 17. In stacking, the shoulders 17, 17 of the nubs abut the shoulders 16, 16 of the indentations, the nubs nesting in the indentations. Both indentations and nubs slope away from the surfaces of the blade in the same direction with respect to the blade. The slope of the indentations and the slope of the nubs are such that each blade can be dislodged from the blade beneath it by the application of a force acting longitudinally of the blade in a direction to separate the abutting shoulders. The blade cannot, however, be dislodged by the application of a longitudinally acting force in the opposite direction due to the positive resistance offered by the contacting shoulders of the indentations and nubs.

The stack, indicated by the numeral 18, is maintained in assembly by means of a clip, comprising two legs 19 and 20 formed by folding a strip of sheet metal. The metal is resilient to render the clip readily releasable but at the same time is stiff enough to clamp the stack firmly. The leg 28 may extend the entire length of the stack, but the leg 19 is shorter to expose the nub 14 of the upper exterior blade (with reference to Fig. 3) and is provided with an aperture 21 which engages the nub 14 of the same blade. This engagement assists in releasably locking the clip to the stack, but by virtue of the slope of the nub and the corresponding slope of the indentation with which it is engaged, does not interfere with the withdrawal of the clip from the stack. The marginal portions of both legs extend beyond the planes of the blade edges in order to protect the latter from injury in handling and loading the magazine. As an additional means for positioning the stack in the clip, an ear 22 is struck downwardly from the leg 18, which resists lateral motion of the stack within the clip, and a second ear 23 is also struck downward from the leg 19, which prevents endwise motion of the stack in the direction of the fold 19 of the legs of the clip. Also an ear 24 is struck upwardly from the leg 20 which cooperates with the ear 22 struck downward from the leg 18. Leg 20 of the clip is also provided with an aperture 25.

The purposes and functions of the various features of the clip and of the nubs and indentations in the blades will be understood after the
razor in which the stack is to be inserted has been described. It may, however, now be pointed out that, if the shoulder of the nub 15 of the upper exterior blade engages a positive stop, the clip may be stripped from the stack in a lengthwise direction without disturbing the stack assembly, since each blade beginning with the topmost blade (with reference to Fig. 3) positively engages the blade succeeding it by virtue of the interengagement of the shoulders on the nubs and indentations.

In describing the razor itself, it is to be understood that the invention relates only to those features involving the insertion of a stack of blades into the magazine and the ejection one by one therefrom. To illustrate an application of the invention however, I show a razor construction in which the blade stack is located in the handle and the blades are, upon ejection therefrom injected into shaving position in a shaving head mounted on a post projecting from the handle. This latter feature however is illustrated merely of a suitable type of razor with which the invention may be used, and so far as the scope of the invention is concerned it will be apparent that it is immaterial how the blades are disposed of after ejection from the magazine.

Proceeding therefore to a description of the razor, the magazine which also serves as a handle for the shaving head comprises an elongated box-like structure 26 closed at one end by the block 27 except for the blade ejection orifice 28, and open at the opposite end to permit the insertion of a blade stack and the operation of the blade-ejecting mechanism. The blade ejection plunger 29, which for purposes of stiffness may be channel-shaped as shown, is provided with a closure block 30 secured to it, for example, by a rivet 31 and is, for convenience in manipulation, provided with a thumb-piece 32 also secured by the rivet 31. The plunger assembly also includes a hook 33, the shank 34 of which is interposed between the block and the plunger and is also secured by the rivet 31. The purpose of the hook will presently appear. A stop to prevent withdrawal of the plunger from the magazine housing is provided by spring 35 pressed by its own resiliency against the inside of the wall of the casing 26 where there is located an indent into which the tongue proj ects. There is thus established a limit to which the plunger can be retracted.

To serve as a guide for the plunger in order that it may travel in a fixed path, there is provided in the casing a lining 36 of channel-shaped cross-section on the edges 37 of which the edges 38 of the plunger slide. To prevent withdrawal of the lining by frictional drag of the plunger or otherwise, there is provided in one wall thereof a spring-pressed lip 39, the tip of which springs against a shoulder in the casing wall.

The spring 40, the function of which is to bear against the blade stack in order to feed blades successively to a position in alignment with the plunger tip and the ejection orifice, may be provided to the lining 36, as indicated at 36a.

The spring normally takes the position shown in Fig. 4 with enough reserve pressure to effectively raise the stack up to the last blade to feeding position. As will be seen (Fig. 6) the tip of the spring will, when a blade stack is completely inserted as shown in Fig. 5, engage the nub 15 of the topmost blade (see Fig. 3), and therefore, while blades may be successively released from the nub and indentation engagement in the direction of the blade ejection orifice, neither the stack as a whole nor any blade or blades can be withdrawn in the opposite direction.

Since it is desirable, and in practice necessary, that the height of the blade-ejection orifice be not substantially greater than the thickness of a blade, there is provided in the blade-ejection orifice a groove 41 to allow passage of the orifice as the blade passes through the orifice. In order to close the groove against the access therethrough of water when the tip of the plunger is located in the groove, as is the case while the razor is being used, the plunger is provided with a projection 42 which is located in the groove when the plunger has completed a blade-ejecting stroke.

The advantages of the invention and the mode of utilizing it will now be explained.

The blades like those shown in Fig. 2 are stacked and retained with their successive indentations in registry as has been described, which brings their edges all on the same side of the stack and flush with each other. The clip is then applied with the aperture 21 registering with the nub 17 which completes the pack. Ordinarily the pack would be assembled by the blade manufacturer. When it is desired to load the magazine, the plunger is first wholly retracted—i.e., to the position shown in Fig. 4. The pack is then laid on the plunger (as in Fig. 4) with the hook 33 entering the aperture 25 of the clip, this engagement however not as yet performing any function. The plunger is then advanced as far as it will go, the closure block 30 abutting the fold of the clip and forcing the pack to ride under the spring 40 and flex it, whereinupon the tip 45 of the spring snaps into position against the shoulder 17 of the nub 15. The tongues 46 serve to locate the blade stack laterally and prevent contact of the blade edges with the wall of the lining or the casing. Thereupon the plunger is fully withdrawn—i.e., to the position shown in Fig. 5, during which the hook 33 is in engagement with the aperture 25, and the tongue 46 spring is impressed by its own resiliency against the inside of the wall of the casing 26 where there is located an indent into which the tongue projects. There is thus established a limit to which the plunger can be retracted.

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ing this angle is increased near the extreme edge. Where this is the case the deflection is such that the deflection may and preferably are in contact throughout with the ground areas of the facets. In this relationship however they are clear of the honed edges by reason of the increased angles and the pack may be handled and shipped and the clip withdrawn from the stack without impairing the sharpness of the blades. The procedure in introducing a pack with a clip of this type and in withdrawing the clip leaving the stack in blade-feeding position is similar to the corresponding procedure followed in the case of the pack of Fig. 3.

4. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing and a blade ejection plunger, the blade pack comprising a stack of blades retained in assembly by a releasable clip, the clip and the plunger being provided with cooperating means for positive engagement with each other during retraction of the plunger, and a part projection from an inner wall of said casing, the stack being provided with means for positive engagement with the said part when the pack is located in the casing in blade feeding position whereby the clip is stripped from the stack of blades as an incident to the retraction of the plunger.

5. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing and a blade ejecting plunger reciprocably mounted in the casing and a blade projecting from an inner wall of the casing, the blade pack comprising a stack of blades and a releasable clip retaining the blades in assembly, the clip being provided with an aperture and the plunger being provided with a hook adapted to engage the said aperture during retraction of the plunger, one of the exterior blades of the stack being provided with means for positive engagement with the said part when the pack is located in blade feeding position in the casing whereby the clip is stripped from the stack as an incident to the retraction of the plunger.

6. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing and a blade ejecting plunger reciprocably mounted in the casing and also with a blade lifting spring within the casing, the blade pack comprising a stack of blades and a releasable clip retaining the blades in assembly, the clip being provided with an aperture and the plunger being provided with a hook adapted to engage the said aperture during retraction of the plunger, one of the exterior blades of the stack being provided with means for positive engagement with the said spring when the pack is located in blade feeding position in the casing whereby the clip is stripped from the stack as an incident to the retraction of the plunger.

7. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing and a blade ejecting plunger mounted in the casing, and also with a blade lifting spring within the casing, the blade pack comprising a stack of blades and a releasable clip retaining the stack in assembly, the clip being provided with an aperture and the plunger being provided with a hook adapted to engage the said aperture during retraction of the plunger, one of the exterior blades of the stack being provided with a nub for positive engagement with the said spring when the pack is located in blade feeding position in the casing whereby the clip is stripped from the stack as an incident to the retraction of the plunger.

8. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing, a blade ejecting plunger reciprocably mounted in the casing and a blade
lifting spring within the casing, the blade pack comprising a stack of blades and a releasable clip retaining the blades in assembly, the stack being provided with a nub for positive engagement with the said spring when the pack is located in blade feeding position in the casing whereby the clip is stripped from the stack as an incident to the retraction of the plunger.

9. The combination of a blade magazine for a razor and a blade pack therefor, the magazine comprising a casing, a blade ejecting plunger reciprocably mounted in the casing and a blade lifting spring within the casing, the blade pack comprising a stack of blades and a releasable clip retaining the stack in assembly, one of the exterior blades of the stack being provided with a nub for positive engagement with the said spring when the pack is located in blade feeding position in the casing whereby the clip may be stripped from the stack by withdrawing the plunger, thus leaving the stack in blade feeding position in the casing.

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