

Dec. 17, 1940.

E. G. BERG

2,225,581

HAIR CUTTING MACHINE

Filed Nov. 13, 1934

2 Sheets-Sheet 1

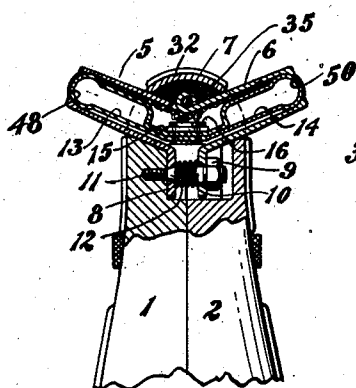
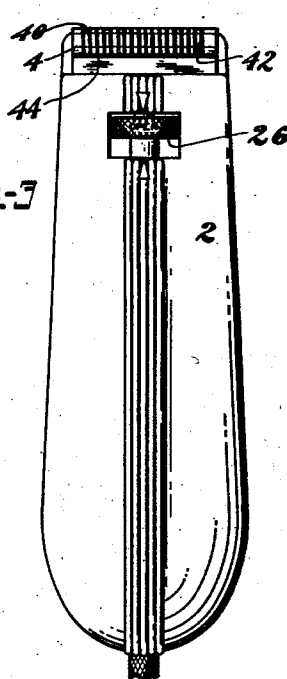
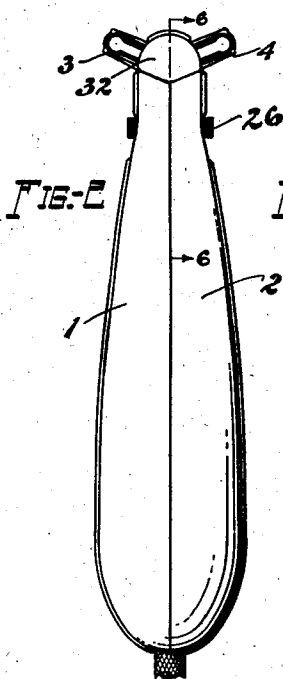
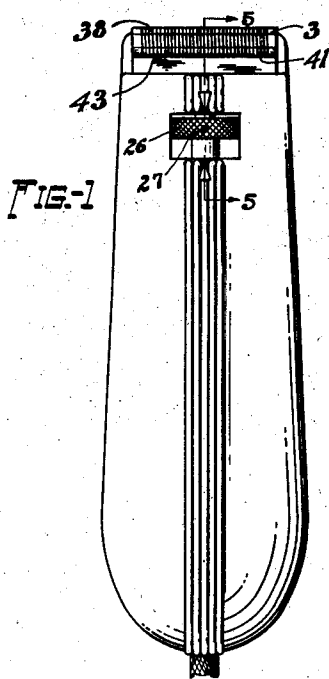


FIG. 4

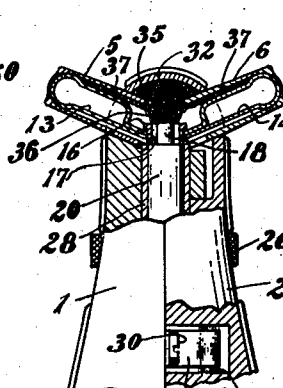


FIG. 5

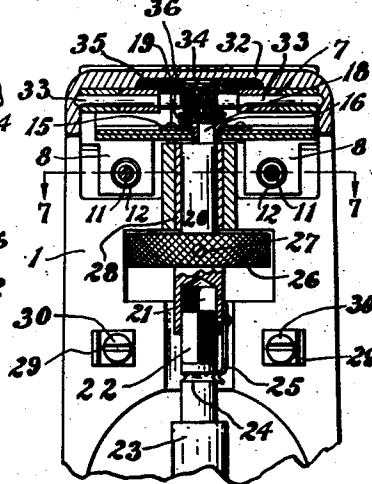


FIG. 6

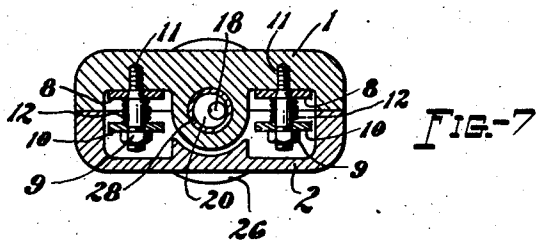


FIG. 7

INVENTOR.
EMIL G. BERG

BY

Edmund J. De Pau
ATTORNEY.

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2.Sheets-Sheet 2

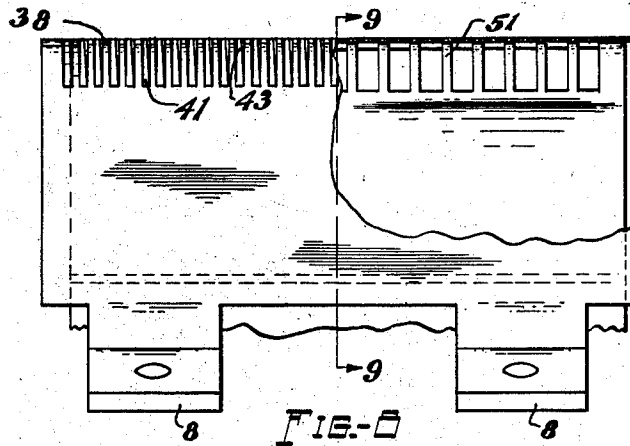


FIG. 8

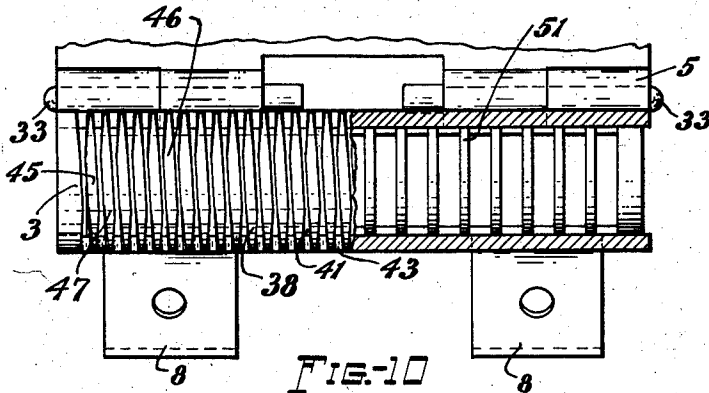


FIG. 10

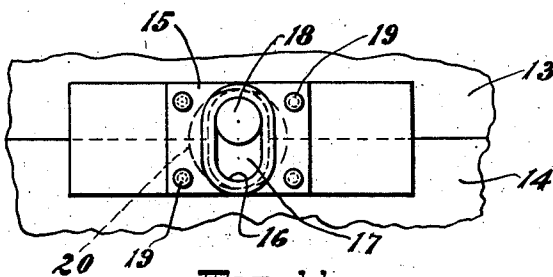


FIG. 11

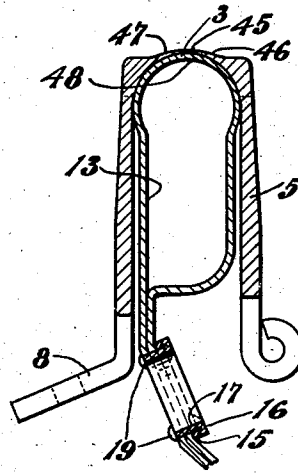


FIG. 9

INVENTOR.
EMIL G. BERG

BY

Edmund J. De Pau
ATTORNEY.

UNITED STATES PATENT OFFICE

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HAIR CUTTING MACHINE

Emil G. Berg, Erie, Pa., assignor of one-twentieth
to Edmund J. Te Pas, Cleveland, Ohio; Coletta
A. Te Pas administratrix of said Edmund J. Te
Pas, deceased

Application November 13, 1934, Serial No. 752,857

6 Claims. (Cl. 30-43)

This invention relates to hair cutting machines and it has for one of its objects the provision of a hair cutting machine having two oppositely disposed cutting heads, one of which is adapted to clip off the hair at a slight distance from the skin as is done with an ordinary clipper, and the other of which is adapted to clip the hair very closely to the skin as is done with an ordinary razor.

the clearance between the guard of the cutter head and the cutter within very close limits.

Another object of the invention relates to the provision of a hair cutting machine having a slotted guard and slotted cutter cooperating therewith, the latter being arranged and operated so that some of the guard slots are open at all times for the unimpeded admission of hair to the slots.

Another object of the invention relates to the provision of a small, compact hair cutting machine which may be held in the hand and manipulated in much the same manner as an ordinary safety razor; the device having provisions to permit its use with its cutting edge or handle held at different angles with respect to the surface being operated upon.

Another object of the invention relates to the provision of a shaving machine of the type shown which greatly reduces the number of strokes which must be made to cut all of the hair on a given area.

Another object of the invention relates to the provision of a hair cutting machine having a slotted guard plate in which the slots extend diagonally across the guard plate, and are wider at their ends than at their central portions.

Another object of the invention relates to the provision of a hair cutting machine having oppositely disposed cutting heads formed in part by a single motor operated cutting member.

Another object of this invention is to provide an improved means for facilitating the cleaning of the slots of a hair cutting machine of the type shown.

Another object of the invention relates to the provision of lubricating means for certain of the operating parts of a hair cutting machine.

Another object of the invention relates to the provision of a hair cutting machine employing a cutter and a guard member and having means for readily separating said members for cleaning and other purposes.

Another object of the invention relates to the provision of a hair cutting machine having a handle, one part of which forms the supporting structure for the operating parts of the machine, the other parts of the handle being held to the first part by concealed means so that no screws or other fastening means are exposed to view when the device is assembled.

Another object of the invention relates to the provision of a hair cutting machine, having oppositely disposed cutter heads with a single cutter operable therein and means for readily adjusting

A further object of the invention relates to the provision of an improved hair cutting machine which is of simple and inexpensive construction, which may be successfully operated without difficulty or preliminary training by the ordinary person, which does not become overheated during its operation and which operates with a minimum of friction so that a very small motor may be successfully used to operate the machine.

With these and other objects in view, the invention consists in the novel construction, arrangement and combination of parts, hereinafter illustrated and described in some of its embodiments in the accompanying drawings, and particularly pointed out in the appended claims.

In the drawings, Figure 1 is a front elevational view of one side of the improved hair cutting machine to which this invention relates; Figure 2 is a view similar to Figure 1, with the parts rotated 90°; Figure 3 is a front elevational view of the opposite side of the machine shown in Figure 1; Figure 4 is an enlarged detail view corresponding to Figure 2, with certain of the parts broken away for sake of clearness; Figure 5 is an enlarged detail central sectional view taken on line 5-5, Figure 1; Figure 6 is an enlarged detail sectional view taken on line 6-6, Figure 2; Figure 7 is a detail sectional view taken on line 7-7, Figure 6; Figure 8 is a greatly enlarged detail side elevational view of the guard and cutter of the machine; Figure 9 is a sectional view taken on line 9-9, Figure 8; Figure 10 is a plan view of the guard and cutter shown in Figure 8; and Figure 11 is an enlarged detail view showing the bushing and cam slot of the cutter.

In the form of the invention illustrated in the drawings, the hair cutting machine comprises a hollow casing or handle formed from mating sections 1 and 2. At the end of the handle there is carried a pair of heads 3 and 4, the former of which is provided for shaving and the latter for the clipping of hair. The shaving and clipping heads and handle form a Y-shaped arrangement, as is best shown in Figure 2 of the drawings, and by disposing the heads in the manner shown, the device may be manipulated in much the same

manner as an ordinary safety razor, and its successful use does not necessitate the holding of the device in an awkward or unnatural position.

The shaving and clipping heads of the device are of similar construction, differing principally in that the slots of the shaving head are narrower than are the slots of the clipper head. The thickness of the metal of the guard member extending across the cutting portion of the shaving head is considerably thinner than the metal of the corresponding portion of the clipper guard member with the result that the shaving head cuts off the hair much closer to the skin than does the clipping head.

The guard member of the device is formed from two bent-over parts, 5 and 6, corresponding ends of which are hinged at 7 to each other. The opposite ends of the guard members are formed with corresponding downturned portions 8 and 10. The parts 8 are fixedly secured to the handle part 1 by any suitable means such as the screws or studs 11. A relatively stiff spring 12 is interposed between the downturned portions 8 and 10 of the guard members and a nut 9 carried by each of the studs 11 is provided for effecting the adjustment of the slotted portions of the guard member with respect to a pair of slotted cutters 13 and 14 of integral construction.

The cutters are formed from a piece of sheet metal which is formed to the shape shown in the drawings. The ends of the piece are disposed alongside of each other and they may be welded or otherwise secured to the rest of the cutter, and a re-inforcing plate 15 may be welded to such part to further increase its rigidity.

The central part of the cutters is apertured for reception of a bushing 16 which is rigid with the cutter. The bushing 16 is slotted at 17 for reception of an eccentric pin 18 provided on one end of a stud shaft 20, the other end of which is provided with a non-circular or prismatic bore 21 for slidably receiving a similarly shaped end 22 of the shaft 23 of a motor (not shown). The welding of the cutter may be dispensed with by securing the bushing 16, the re-inforcing plate 15 and the cutter parts to each other by any other suitable means such as the rivets 19.

The motor shaft 23 is annularly grooved at 24 for detachable engagement with a spring catch 25 carried by the end of the stud shaft 20 and provided for the purpose of holding the eccentric pin 18 in its operative position in the bushing 16. A manually operative wheel 26 carried by the stud shaft 20, is provided for the starting of the motor of the device. The wheel 26 is secured to its shaft by any suitable means such as the set screw 27. The stud shaft 20 is mounted in a bearing or bushing 28, about which the handle part 1 may be formed during the casting thereof, or the bushing 28 may be inserted in a suitable opening provided therefor, subsequently to the formation of the handle part 1.

The handle parts 1 and 2 are preferably made from one of the aldehyde condensation products, which products may be readily molded in a variety of shapes without great difficulty. A pair of similarly formed spring clips 29, 29 secured to the handle part 1 by means of screws 30, 30 engage with notches 31 formed in the handle part 2 and thus provide means for holding the handle parts 1 and 2 detachably secured to each other. This form of securement dispenses with the use of exposed securement devices, thus enhancing the appearance of the device. Exposed

screws and other visible securement devices are also objectionable because they transmit heat from the motor inside the handle and thus make the device uncomfortable to use.

The device is provided with a top cover part 32 formed from a material similar to that used in the handle parts 1 and 2. The cover part 32 is held in place by spring-pressed plungers 33, 33 which also serve as hinge pins for the hinge 7 of the guard members 5 and 6. The 10 ends of these pins engage with suitable notches formed in the sides of the cover member 32, and are held thereagainst by means of a U-shaped spring 34 which presses against the ends of the pins 33. The cover part 32 is hollowed-out for 15 reception of a fibrous oil retaining material 35 which has portions 36 and 37 respectively, extending between the inner ends of the pins 33 in contact with the eccentric pin 18 and the bearing member 16 and between the guard and 20 cutter member to the contacting parts thereof, thus serving as a means for effectively lubricating the pin 18, the stud shaft 20 and its bearing and also the contacting parts of the cutters and their guards.

In assembling the cutter head the nuts 9 are adjusted so as to provide a free yet very close fit between the cutters 13 and 14 and their associated guard members 5 and 6 without, however, causing them to bind on such guard members. By reason of this arrangement, a very close adjustment may be had between the cutting members and the guard members so that the machine will clip the hair cleanly without at the same time causing overheating of the 35 guard members 5 and 6, as will occur where there is any considerable friction on these members. The production of heat at this point is particularly objectionable as it may become so great as to prevent the use of the device after 40 it has been running a short time, either by reason of the load imposed on the motor or by reason of the fact that the hot guard members cannot be held against the skin of the user without great discomfort.

The cutting edges of the shaving and clipping heads are formed in part by the edges at the underside of the bars 38 and 40 defining the slots 41 and 42 of the guards of the shaving and clipping heads respectively, as best shown in Figures 1, 3, 8 and 10. The slots 41 and 42 of the guard members are widened at their respective ends 43 and 44 to facilitate the entry of the hairs into the slots. Because of the construction just mentioned, in the normal use of the device, as it is moved back and forth over the skin in a direction substantially parallel with the slots of the outer guard member and as the cutter head is moved in one direction or the other, the hairs are fed into the slots at the lower or leading, relatively wide portions thereof and upon further movement of the cutter head in the same direction, the hairs find their way to the upper or following, relatively narrow portions of slots where they are sheared off very close to the skin. The thickness of the cross-bars 38 and 40 increases as the ends of the bars are approached, thus to prevent the skin from projecting below the bottom of the widened ends of the slot. The sides of the widened portions 43 and 44 of the slots are angularly disposed so that these parts of the slots are slightly wider at the top than at the bottom and this also facilitates the entry of hair into the slots. The outer faces of the portions of the bars 38 and 40 defining the

widened portions of the slots are made flat so as to stretch the skin before it comes in contact with the curved cutting portion of the cutter heads.

Referring to Figures 8, 9 and 10 which show in detail the guard and cutter of the device, it will be seen that the thickness of the guard member is reduced as its center point 45 is approached, and the space or mid-section between the intermediate portions 46 and 47 of the cross-bars 44 constitutes the effective cutting area of the shaving head. The corresponding portion of the clipping head while of similar shape is considerably thicker and its slots too are wider than those of the shaving head as it is neither intended nor desired that the clipping head cut nearly as closely to the skin as does the shaving head. Otherwise the clipping head and the shaving head are of similar construction as to the foregoing details.

The cutters of both the shaving and clipping heads are of similar construction and shape, comprising rounded ends 48 and 50 with cut-out portions defining cutter bars such as indicated by the numeral 51 for the part of the cutter received in the shaving head. These bars extend a distance slightly beyond or below the narrowed portion of the slots of the guards and as they are reciprocated by the motor, they shear off the hairs projecting through the slots of the guards.

The supply of lubricant of the fibrous material 35 may be readily replenished by simply removing the cap 32 whereupon such material is exposed to view. Similarly, when it is desired to clean or sterilize the cutter, the cap 32 is first removed and then the wheel 26 is moved downwardly whereupon the cutter is free for removal from the guard member.

In the finished device, the cutting area of the slot extends a distance of approximately three-thirty seconds of an inch for both the shaving and clipping heads. The slots of the guard member of the shaving head may be of a width of eight thousandths of an inch or less and the slots of the guard member of the clipping head may be one-sixty-fourth of an inch or wider. The bars of the shaving head may be two thousandths of an inch thick at their center and the bars of the guard of the clipping head may be ten thousandths of an inch thick at the center. These dimensions may be varied somewhat from the dimensions given, for example, the guard members could be thickened at their midpoints if the slots were made wider. The slant of the slots too may be varied from the angle shown which is preferably between two and three degrees, without sacrificing all of the benefits of this form of slot construction, which permits the cutting of hair over a wider area for a back-and-forth movement of the device over a given locality while at the same time facilitating such action by providing for a shearing effect due to the angular relation of the cutting edges of the cutter and the guard.

The slots of the clipping guard are shown as being cut straight across the rounded edge of the guard as indicated in Figure 3, largely for the purpose of illustrating both straight and diagonal slots, either form of construction being usable although the diagonal slots have certain advantages as have been previously pointed out. It should be noted that the slots of the guards in both the shaving and clipping heads are slightly shorter than are the slots in the cutters, the

guard slots extending through a distance somewhat less than one hundred and eighty degrees so as to reduce and prevent excess refuse collecting between the adjacent sides of the guard and cutter member, as might occur if such slots extended below the contacting portions of the guard and cutter members. The adjacent sides of the guard and cutter members, as can be best seen in Figure 9, are spaced from each other so that even if small amounts of hair and the like collect here, it will not impair the operation of the device.

The manipulation of this device does not call for any unusual skill on the part of the user. The curved construction of the cutting faces permit the device being held at different angles without loss of efficiency and the working faces by reason of being arranged on the angle shown with respect to the handle will be naturally presented to the skin in proper position without holding the hand in an unnatural way. The slight recesses or channels formed between the outer edges and the curved central part of the guards tend to stretch out the skin and to straighten out the hairs before they reach the curved cutting part of the cutter heads.

The ease with which the device may be sterilized, cleaned and kept properly lubricated, has been previously pointed out. Ordinarily, however, it is not necessary to remove the cutter to clean out the guard slots. By turning the starting wheel 26 so that the word "open" thereon is located between the arrows on one side of the handle as shown in Figure 3, the slots of the guard will be found to be in open position and they may be readily cleaned by use of a brush with relatively fine hairs. The opening of the slots is further facilitated by having the bars of the cutter slightly narrower than the bars of the guard member.

One of the important features of this invention relates to the provision of relatively wide slots in the cutter bar instead of having slots of the same width as in the guard member. In a device of this kind, the cutter is rapidly reciprocated many hundreds of times each minute and in order to cut the hair it is necessary to insert the hair in the slot of the cutter as well as in the slot of the guard. With a cutter slot eight thousandths of an inch wide and with cutter bars from twenty to twenty-five thousandths of an inch wide, it is easy to see that the slots of the guard and cutter are open or in alignment with each other only a small fraction of the time. The problem here might be likened to threading of a sewing machine needle with the machine running at high speed. If, however, the cutter slots are widened tremendously, as is here the case, the efficiency of operation of the device will be found to have increased many fold and the hairs will find their way to the slots of the cutter without difficulty.

In shaving with a device of the type disclosed, the hairs are cut off in furrows of a width equal to the width of the slots of the guard. The diagonal arrangement of the guard slots has the effect of widening the slots without actually doing so, however, as it is at the ends of the narrowed portions of the guard slots where most, if not all of the cutting occurs. By using diagonal slots, the ends of the cutting portions of the guard slots are offset with respect to each other and a back and forth movement of the device in a straight line will serve to cut the hair over an area equal to twice the width of the guard slots

whereas if the slots had been straight such cutting area would have been just one half the area stated. The diagonal arrangement of the slots of the guard and the straight slots of the cutter produces a shearing action when the device is used and the hairs are cut more closely and cleanly than would be the case if the cutting bars or slots were parallel with each other.

Furthermore, it is to be understood that the particular forms of clipping and shaving apparatus shown and described, and the particular procedure set forth are presented for purposes of explanation and that various modifications of said apparatus and procedure can be made without departure from this invention as described in the appended claims.

Having thus described my invention what I claim is:

1. A hair cutting machine having a handle with a movably mounted cutter element supported thereon, a driving shaft within said handle having a disengageable driving connection with said cutter element which is adapted to hold the cutter element in the machine, and a part associated with said driving shaft and accessible exteriorly of said handle, said part being axially movable and operative upon such movement to disconnect the driving shaft from said cutter element whereby the cutter element may be removed from the machine.

2. A shaving machine comprising, a handle, oppositely disposed cutter heads carried by said handle including outer guard members each having a series of relatively fixed cutter bars and forming an enclosure with a passageway extending transversely of the cutter bars and cutters movably mounted in said passageway having cutter elements cooperating with said cutter bars, said handle and cutter heads being disposed substantially in the shape of the letter Y with the cutting portions of the device located at the ends of the two branches of the Y, power driving means in said handle, and means connecting said power driving means to said relatively movable cutters for reciprocating the same transversely of said fixed cutter bars.

3. A hair cutting device comprising, a hollow guard member forming an enclosing structure

having oppositely disposed slotted working faces facing away one from the other, a cutter member slidably received inside said guard member, said cutter having separate and oppositely disposed working faces with cutter elements presented to the inner surfaces of the working faces of the guard member, and a common manually settable means for effecting adjustment of the working faces of said guard member toward or from the working faces of said cutter member.

4. A hair cutting device comprising a hollow guard member having oppositely disposed slotted working faces facing away one from the other, a cutter member slidably received inside said guard member, said cutter having separate and oppositely disposed working faces presented to the inner surfaces of the working faces of the guard member, and means for simultaneously shifting the working faces of said guard member with respect to the working faces of said cutter member for adjusting the contact pressure therebetween.

5. A device of the class described comprising, a relatively fixed outer cutter element and an associated inner cutter element movably mounted therein, and means including a displaceable member for driving said inner cutter element and for maintaining the same in place in said outer cutter element operative upon displacement of said displaceable member for freeing said inner cutter element for removal from said outer cutter element with the outer cutter element in place on the device.

6. A device of the class described comprising, a hollow handle, a cutter head carried by said handle including a relatively fixed outer cutter element and an associated inner cutter element movably mounted therein, means including a displaceable member located interiorly of the device for driving said inner cutter element and for maintaining the same in place in said outer cutter element, and a member accessible exteriorly of said handle and operative to effect the displacement of said displaceable member for freeing said inner cutter element for removal from said outer cutter element with the outer cutter element in place on the handle of the device.

EMIL G. BERG.