

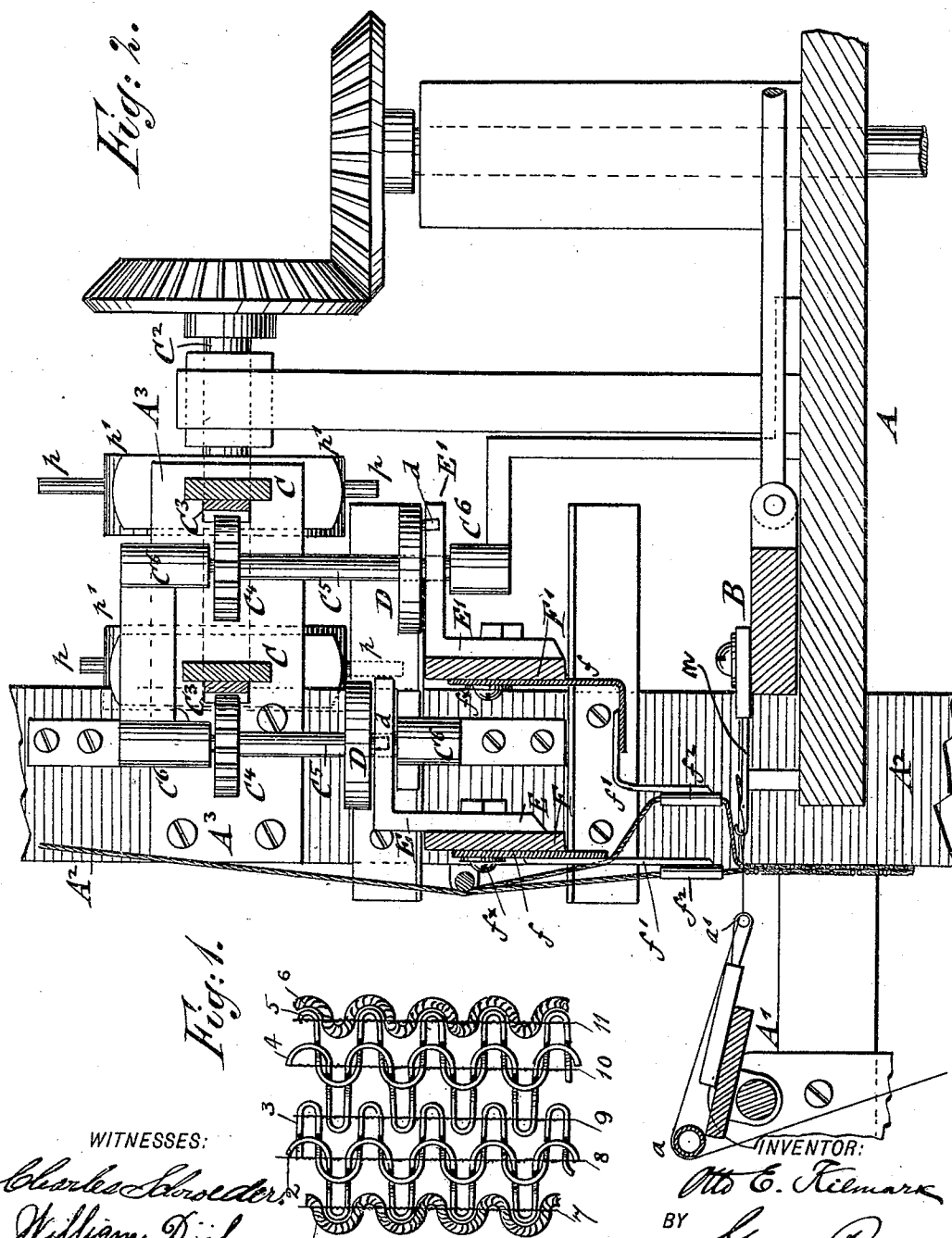
(No Model.)

3 Sheets—Sheet 1.

O. E. KILMARX.
KNITTING MACHINE FOR TRIMMINGS.

No. 515,086.

Patented Feb. 20, 1894.



(No Model.)

3 Sheets—Sheet 2.

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Fig. 5.

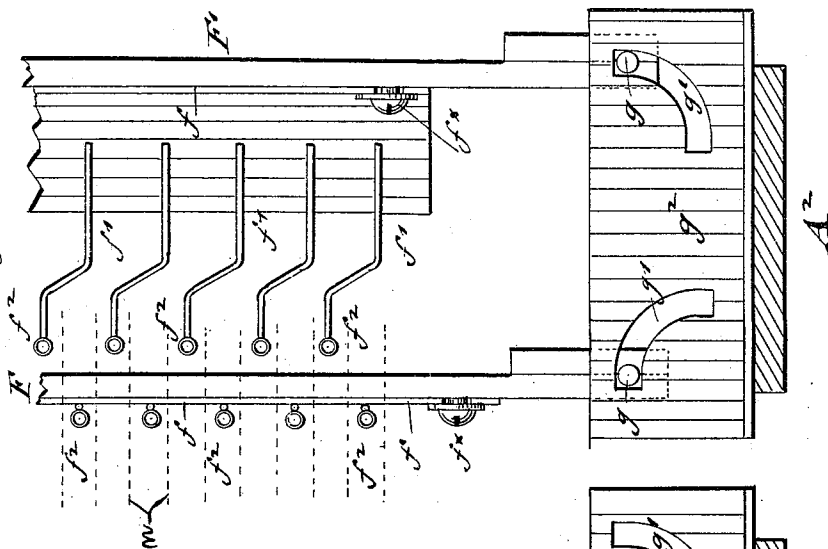


Fig. 4.

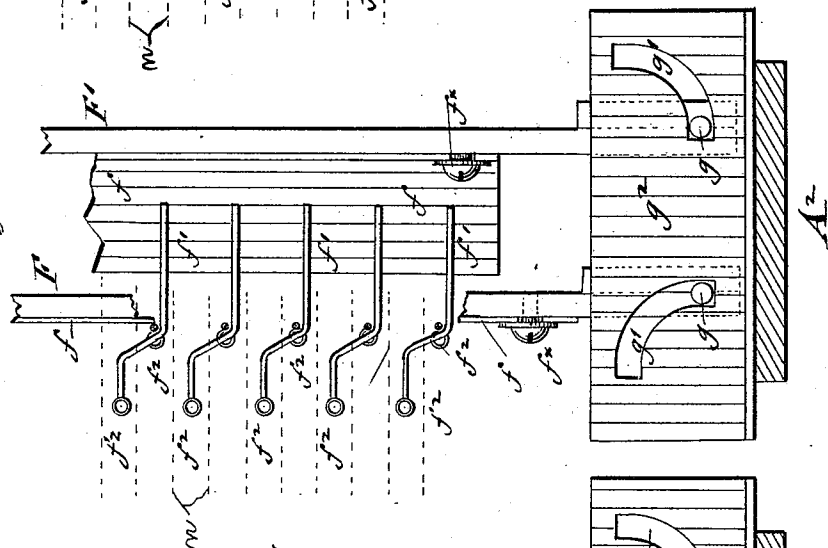
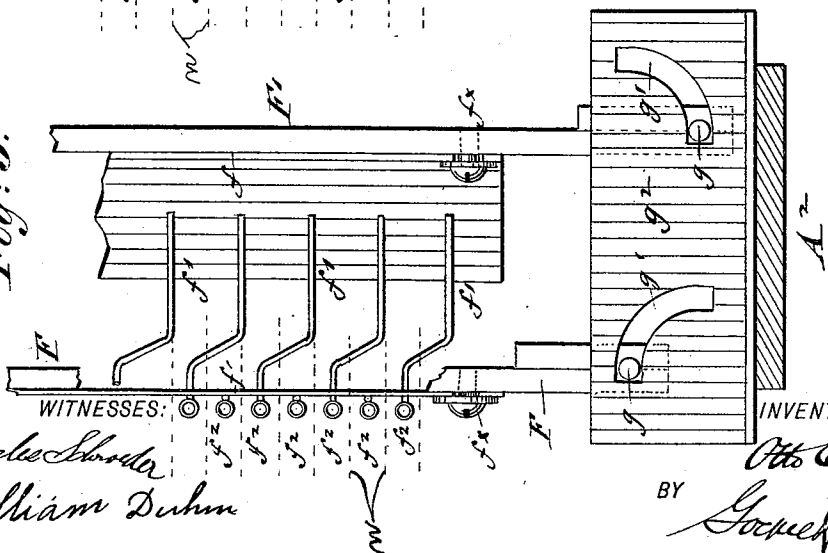


Fig. 3.



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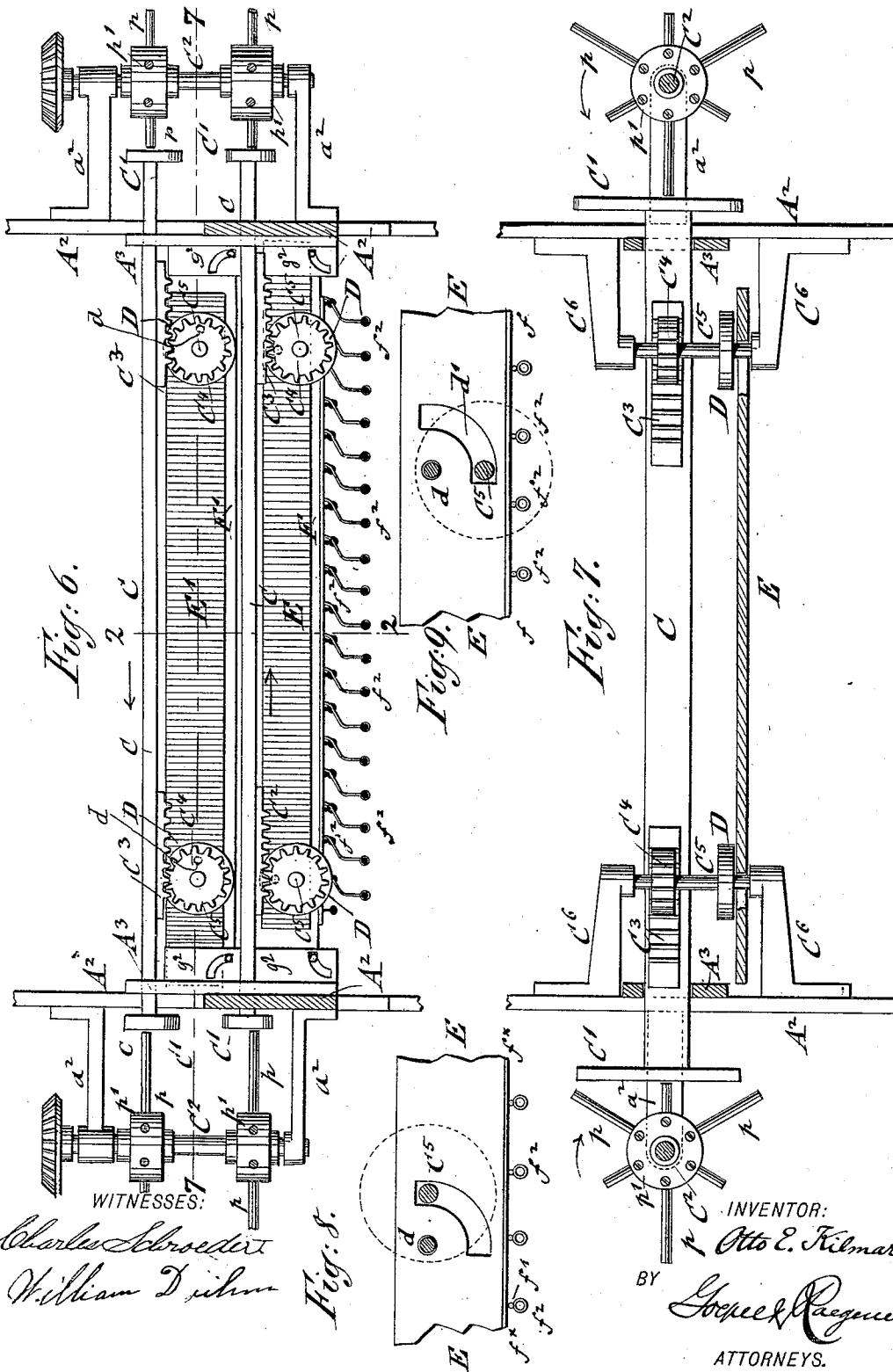
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

OTTO E. KILMARX, OF WEST HOBOKEN, NEW JERSEY, ASSIGNOR TO
LESCHHORN & RIEGELMANN, OF NEW YORK, N. Y.

KNITTING-MACHINE FOR TRIMMINGS.

SPECIFICATION forming part of Letters Patent No. 515,086, dated February 20, 1894.

Application filed May 19, 1892. Serial No. 433,557. (No model.)

To all whom it may concern:

Be it known that I, OTTO E. KILMARX, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Knitting-Machines for Trimmings, of which the following is a specification.

This invention relates to knitting machines of the class on which passementerie trimmings are made, said improvements relating more especially to the means by which the warp cords of the trimmings are formed into loops that interlock with each other, while they are bound off by the knitting threads, so that a new style of trimming for upholstering and other purposes is obtained; and the invention consists of a knitting machine for trimmings having two parallel bars adapted to reciprocate in a complex longitudinal and lateral movement, the front bar being provided with straight downwardly extending arms having guide tubes for one set of warp cords while the rear bar is provided with bent arms having guide tubes at their lower ends for the second series of warp threads, said front and rear bars being operated by suitable mechanism in such a manner that the guide tubes of the front bar are disposed in line with the guide tubes of the rear bar and then moved to the rear and right thereof and back to the first position, and the guide tubes of the rear bar are moved to the rear and left of the guide tubes of the front bar and returned to the first position, the two sets of guide tubes moving alternately from right to left and left to right across the path of the knitting needles by which the warp cords are bound off with the knitting threads.

The invention consists secondly of the combination with the front and rear bars and the cord guiding tubes supported by the same, of mechanism for alternately changing the relative position of the guide tubes to each other, which mechanism will be described in detail hereinafter and finally pointed out in the claims.

In the accompanying drawings Figure 1 represents a plan view of one style of trimming made on my improved knitting machine. Figure 2 represents a vertical transverse section

on an enlarged scale of my improved knitting machine taken on line 2—2 of Fig. 6. Figs. 3, 4 and 5 represent detail plan views of this machine showing different relative positions of the front and rear bars and the cord guiding tubes attached thereto. Fig. 6 represents a plan of my improved knitting machine partly in section showing the mechanism by which motion is imparted to the actuating bars of the machine. Fig. 7 represents a vertical longitudinal section on line 7—7 of Fig. 6, and Figs. 8 and 9 represent details of the mechanism by which the tube supporting bars are moved in forward and backward directions according to the relative position to be imparted to the cord guiding tubes.

Similar letters and figures of reference indicate corresponding parts in all the figures.

Referring to the drawings A represents the supporting table of my improved knitting machine for trimmings. Along the front part of the machine extends an inclined bar A' which is provided with a tube *a* at its upper part and with eyes *a'* at the inner part. The knitting threads that serve for binding off the warp cords are conducted over the tube and through the eyes *a'* to the needles of the reciprocating needle bar B. On the table A are supported upright standards A², to which are attached guide plates A³ for the longitudinal bars C, that are provided with enlarged end plates C'. The end plates C' are alternately acted upon by the pusher arms *p* that are applied to hubs *p'* on short transverse shafts C² which are supported in suitable bracket arms *a*² of the standards A², said shafts receiving intermittent rotary motion from any well known mechanism so as to impart a rectilinear reciprocating motion to the longitudinal bars C. A shaft C³ with two sets of pusher arms, one set for each reciprocating bar C is arranged at each end of the machine, a longer pusher arm alternating with a shorter arm and the longer arm of one set, at one end of the bar C working in connection with a shorter pusher arm at the set at the opposite end of the bar C, as shown clearly in Figs. 6 and 7. To the faces of the reciprocating bars C are applied racks C⁴ which mesh with pinions C⁵ applied to short vertical spindles C⁵ supported in bracket

shaped bearings C^6 attached to the upright standard A^2 and the table A , as shown in Figs. 2 and 7.

The actuating mechanism of the reciprocating bars C , is so arranged, that the front bar C is moved to the right and then back to the left and then the rear bar is moved to the left and then to the right into its first position; each bar alternating with the other in a complete movement.

To the spindles C^5 are attached disks D which are connected by eccentric pins d with horizontal bars $E E'$ which bars are guided below the disks D on the lower bracket arms C^6 , as shown in Figs. 2 and 7. The horizontal angle bars $E E'$ are provided with quadrantal slots d' through which the spindles C^5 pass, said slots permitting the forward and backward motion of the horizontal bars $E E'$ by the action of the eccentric pins d on the same, as shown in the diagram Figs. 8 and 9.

When the front longitudinally reciprocating bar C is moved from left to right, the racks at the opposite ends thereof and pinions meshing therewith impart an axial motion to the front spindles C^5 and the front disks D by their pins d move the horizontal bar E backward and to the right, as shown in Fig. 9. And when the said front bar C is next moved from right to left, the horizontal bar E is moved forward and to the left by means of the intermediate mechanism just described connecting it with said front bar C . The quadrantal slots d' permit the free motion of the horizontal bar E along the spindles C^5 . When the rear bar C is moved from right to left the racks at the opposite ends thereof which mesh with the rear set of pinions impart an axial motion to the rear pair of spindles C^5 so that the rear disks D by their pins d move the horizontal bar E' backward and to the left and when said rear bar C is next moved to the right, said bar E' is restored to its first position.

To the vertical portions of the angle bars $E E'$ are attached respectively a front bar F and a rear bar F' as shown in Fig. 2. To the front bar F is attached by clamping screws f^x a plate f , to which the upper ends of the downwardly extending arms f' are applied. To the lower ends of arms f' are attached the front cord guiding tubes f^2 . To the rear bar F' is attached in the same manner by clamping screws f^x a plate f , to the lower forwardly bent part of which are attached the bent arms f' , to the lower ends of which are applied the rear cord guiding tubes f^2 . For steadying the motion of the bars F and F' , they may be guided at both ends by pins g and quadrantal slots g' of horizontal guide plates g^2 which are attached to the upright standards A^2 , as shown in Figs. 3, 4 and 5. The front and rear cord guiding tubes f^2 are arranged above the horizontally reciprocating needles of the knitting machine, and serve to guide the warp cords by which the interlocking loops are formed, so that the lat-

ter are bound off by the knitting threads in the manner well known in knitting machines of this class.

In the use of this machine for making *passementerie* trimming similar, for instance, to that illustrated in Fig. 1, six guide tubes f^2 for the warp cords are required, three of which are applied to the front bar F and three to the rear bar F' . The warp cords 1, 3 and 5 of said figure are passed through the tubes of the front bar, and the cords 2, 4 and 6 are passed through the tubes of the rear bar which alternate with those of the front bar. By varying the arrangement of the cords within the tubes, a trimming may be formed in which the center loops are not interlooped but only connected by the knitting threads as in Fig. 1. Five needles will be used in making this trimming, which will carry the five knitting threads 7, 8, 9, 10 and 11. For forming the interlocking loops of the warp cords four different motions are imparted to the cord guiding tubes of the front and rear bars F and F' which motions are imparted by the actuating mechanism hereinbefore described. The different relative positions of the cord guiding tubes of the front and rear bars when the needles engage said cords are shown in Figs. 3, 4 and 5. In the position shown in Fig. 3, the cord guiding tubes of both bars are disposed in line, the tubes of the rear bar alternating with those of the front bar. While the warp cords are held in this position by the tubes, the needles are moved forward and a stitch is knit. Then by its actuating mechanism, the front bar F is moved toward the right and rearward into the position shown in Fig. 4 and the cord guiding tubes thereof carrying the cords 1, 3 and 5 are disposed in rear of the cord guiding tubes of the rear bar carrying the threads 2, 4 and 6 and each of said tubes of the front bar is disposed at the right of the corresponding tube of the rear bar in relation to which it was on the left side in the first position of the bars. In this second position the needles are moved forward and the warp cords are again engaged by the knitting threads. Then the front bar is moved toward the left and forward to its original position, bringing all the tubes of both bars together into line. Then the needles again operate the warp cords. Then the rear bar is moved rearward to the left and the tubes carrying the threads 2, 4 and 6 are disposed in rear of the tubes of the front bar and to the left thereof respectively, as shown in Fig. 5. In this position the needles again move forward and make a stitch. Then the rear bar F' is moved to the right and back into its original position where all the tubes of both bars are in line, and in this position a further knitting takes place. The knitting then continues, the bars repeating their compound movements.

By the motions described the interlocking of the loops of the warp cords shown in Fig. 1, is produced, and the knitting threads bind

off the interlocking loops and retain them in position.

As many trimmings can be made simultaneously on the machine as there are available sets of guide tubes in the machine, and the number of guide tubes depends on the width of the machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a knitting-machine for trimmings, the combination, of a horizontal front bar having downwardly-extending arms and cord guiding tubes at the lower ends of said arms, a horizontal rear bar provided with bent arms, and cord guiding tubes at the lower ends of said bent arms, and mechanism by which a horizontally-reciprocating and simultaneously a forward and backward motion is imparted to the front and rear bars in regular alternations, so that the interlocking of the loops of the warp-cords is produced, substantially as set forth.

2. The combination, of front and rear bars, having downwardly extending arms and cord guiding tubes at the lower ends of said arms, disks having eccentric pins engaging said bars, vertical spindles applied to said disks and passing through slots of the front and rear bars, pinions on said spindles and hori-

zontally reciprocating bars having racks meshing with said pinions, whereby the required motion for interlocking the cord loops is imparted to the front and rear bars and their cord guiding tubes, substantially as set forth.

3. The combination, of horizontally guided actuating bars, means for alternately reciprocating the same, racks applied to said reciprocating bars, vertical spindles provided with pinions meshing with said racks, disks applied to the spindles and provided with eccentric pins, horizontal bars having arc-shaped slots for the passage of the spindles, said bars being engaged by the pins on said disks, guide-plates at the ends of said bars also provided with arc-shaped slots for guiding pins at the ends of said horizontal bars, vertical front and rear bars attached to the horizontal bars, said front and rear bars being provided with downwardly-extending arms and cord-guiding tubes at the lower ends of said arms, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

OTTO E. KILMARX.

Witnesses:

PAUL GOEPEL,
CHARLES SCHROEDER.