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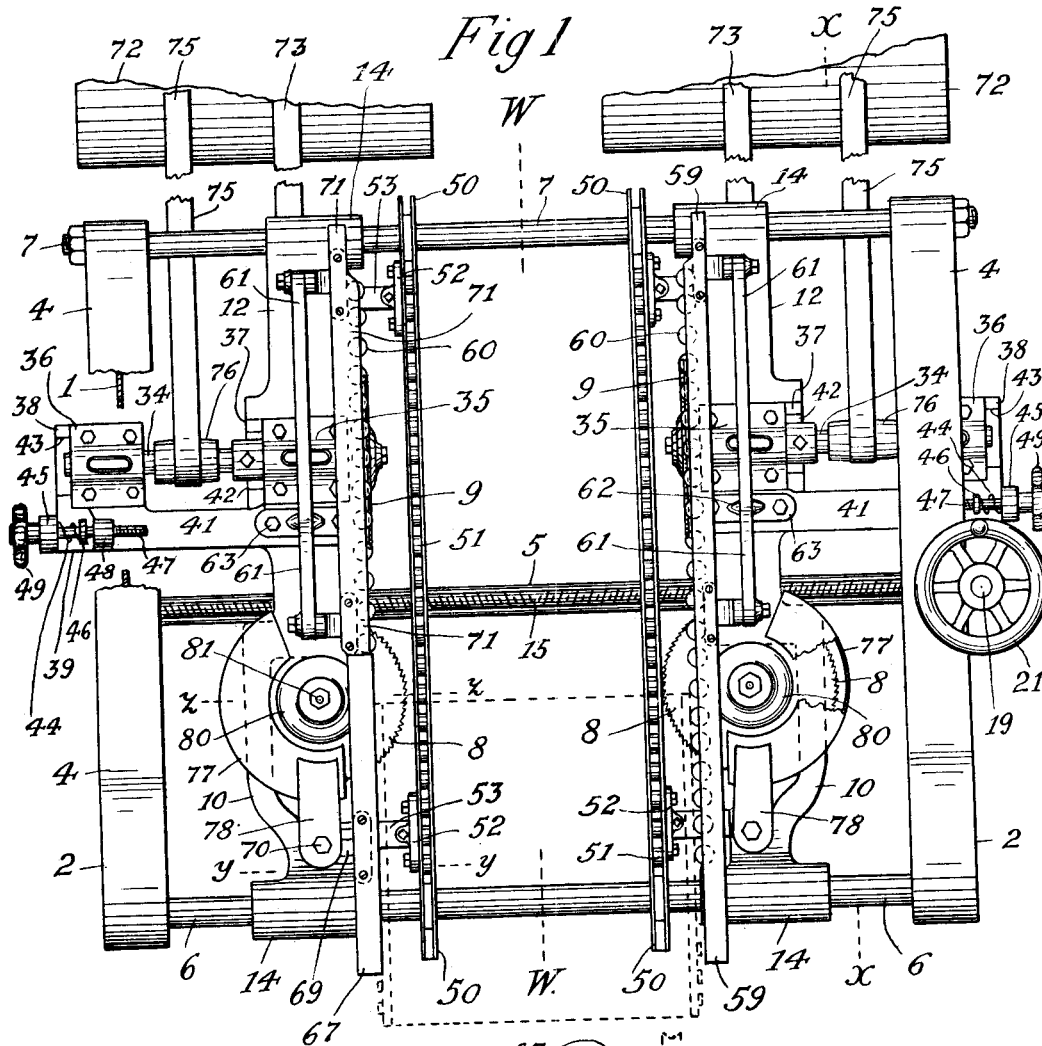
Patented June 11, 1901.

J. E. ERICKSON.  
BOX TRIMMING MACHINE.

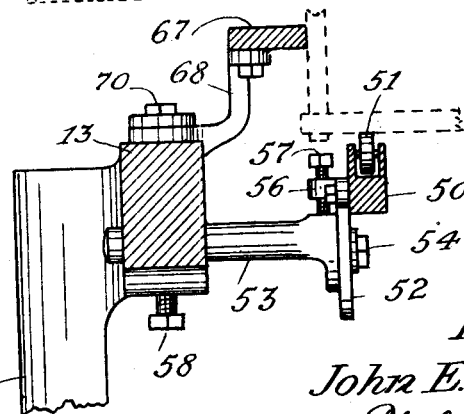
(Application filed July 17, 1900.)

3 Sheets—Sheet 1.

(No Model.)



*Fig 5*



Witnesses  
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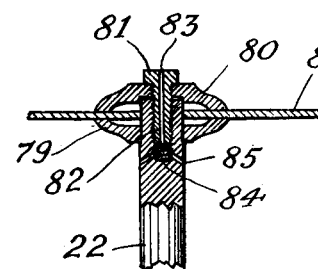
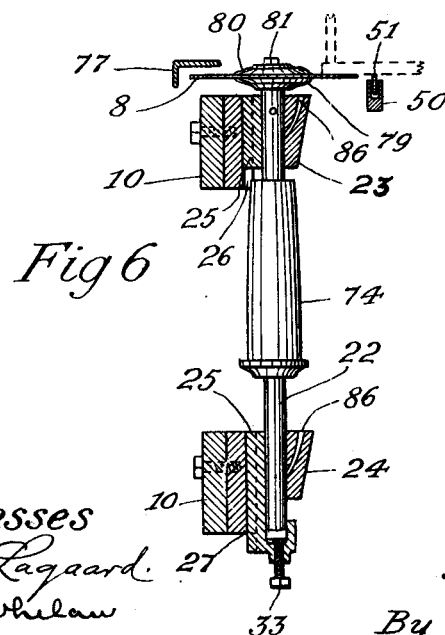
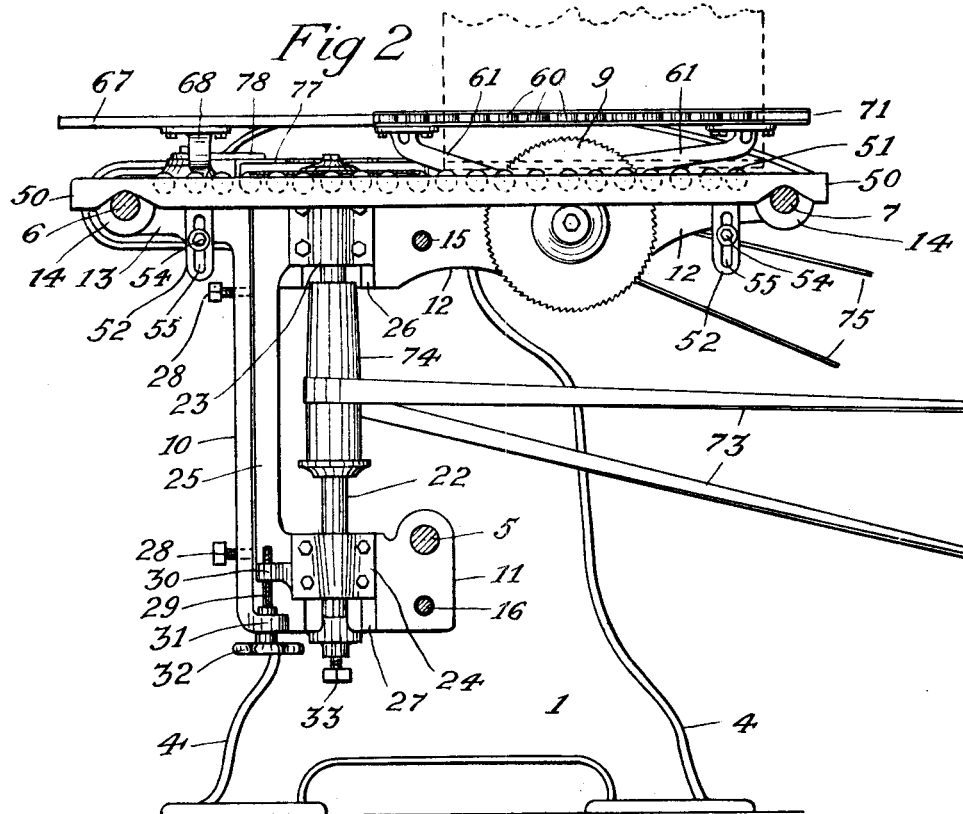
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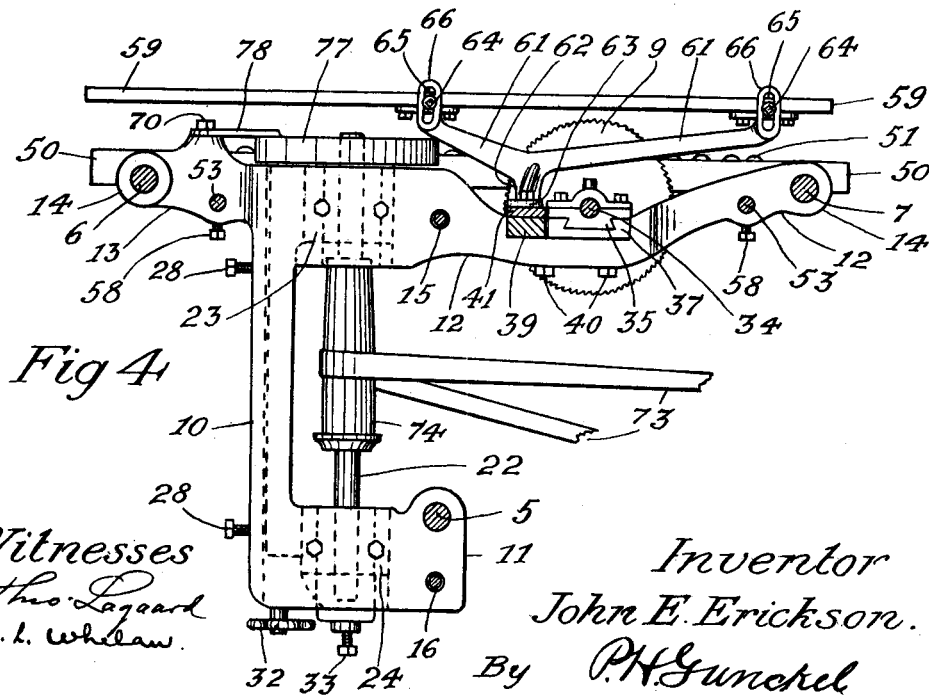
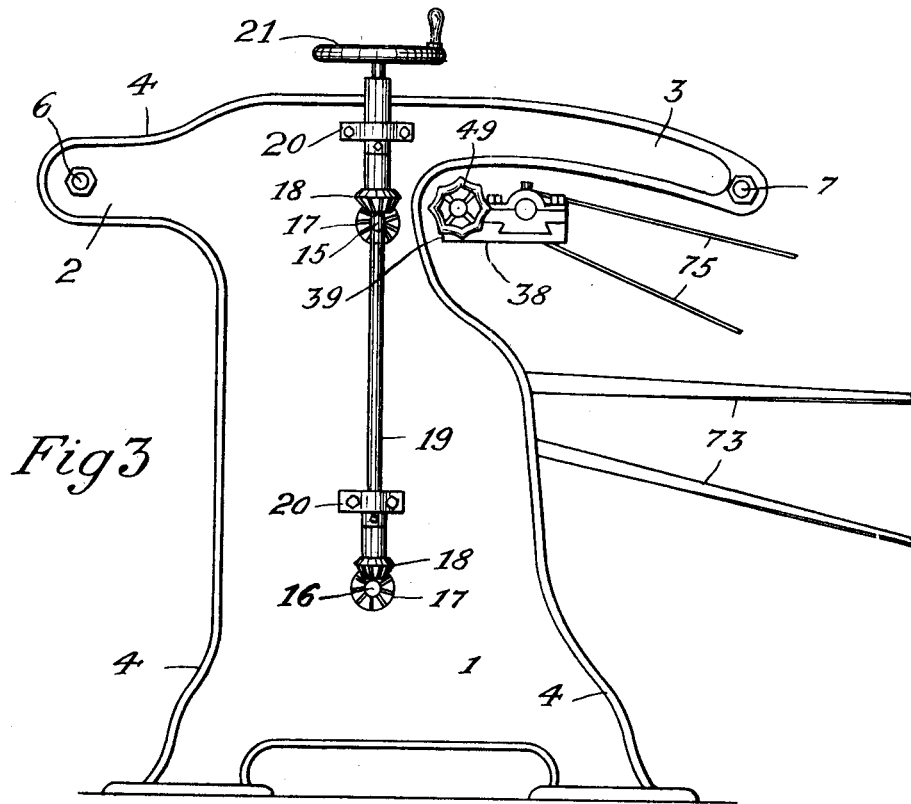
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(No Model.)

(Application filed July 17, 1900.)

3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

JOHN E. ERICKSON, OF ST. PAUL, MINNESOTA.

## BOX-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,940, dated June 11, 1901.

Application filed July 17, 1900. Serial No. 23,862. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. ERICKSON, a citizen of the United States, residing in the city of St. Paul, county of Ramsey, and State of Minnesota, have invented certain new and useful Improvements in Box-Trimming Machines, of which the following is a specification.

My invention relates to machines for trimming off projections from the edges of boxes; and its principal objects are to provide pairs of circular saws for simultaneously trimming opposite edges of a box, convenient means for ready adjustment of the saws in lateral and vertical directions, and improved feeding and guiding devices for presenting the box to the saws.

My improved machine, described in a general way, consists of a supporting-frame, a horizontal and a vertical saw at opposite sides of the middle of the frame and laterally-adjustable frames for carrying the saws, screws for simultaneously adjusting the saw-frames toward or away from each other, means for vertical adjustment of the horizontal saws, guides for the box arranged to yield laterally under pressure from the box and carry the vertical saws with them, suitable series of rollers for supporting and guiding the box, and suitable driving mechanism arranged to accommodate itself to the varying positions of adjustment of the saws.

My improvements in connection with such machine are illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the machine; Fig. 2, a vertical sectional view on the line *ww* of Fig. 1; Fig. 3, an end elevation viewed from the right of Fig. 1; Fig. 4, a vertical section on the line *xx* of Fig. 1; Fig. 5, a vertical section of a front portion of the machine on the line *yy* of Fig. 1; Fig. 6, a vertical section on the line *zz* of Fig. 1, showing one of the horizontal saws, its arbor, and immediate connections; and Fig. 7, a central vertical section, enlarged, of the upper portion of Fig. 6.

In such drawings the stationary sides of the main frame of the machine are shown as consisting of upright metal plates composed of web portions 1, having forward and rearward extensions 2 and 3 at the top and having flanges 4 on opposite sides entirely around

their margins to render the frame strong and rigid, although comparatively light. The bodies of these plates are connected near their middle portions by a cross-rod 5, and the arms 2 and 3 are connected by similar rods 6 and 7. These rods 5, 6, and 7 in addition to holding the side plates in place serve also as supports and guides for the saw-carrying frames.

Four saws are employed in the machine—two horizontally-arranged saws 8 at opposite sides of the middle of the frame near the front and two vertically-arranged saws 9 at opposite sides near the rear end.

The main carrying-frames for the opposite sets of saws and their connections consist of upright members 10 at the front of the machine, relatively short inward arms 11 on the lower ends of the former, relatively long inward extensions 12, and short outward arms 13 on the upper portions of the members 10. These frames are supported and arranged to slide on the guide-rods 5, 6, and 7, the lower arms 11 engaging loosely on the rod 5 and the extremities of the upper arms being provided with sleeves 14, which slide freely on the rods 6 and 7, respectively. These frames are arranged to be moved bodily toward or away from the center by upper and lower screws 15 and 16, having unthreaded end portions supported by the frame 1 and reversely-threaded inner portions engaging the arms 11 and 12 of the saw-frames. The screws have beveled gears 17 at one end which engage with the gears 18 on a vertical shaft 19, that is journaled in bearings 20 on the outside of the frame 1. A hand-wheel 21 on the shaft 19 enables it to be turned in the direction required to move the frames toward or away from each other, as may be desired.

The horizontal saws 8 are carried on the heads of spindles 22, and the latter are journaled in vertically-adjustable bearing-boxes 23 and 24, the former being on inward extensions from the upper and the latter on like extensions from the lower ends of upright plates 25. The boxes 23 and 24 are arranged in guideways 26 and 27 in the frame members 12 and 11, respectively, and the plates 25 abut the uprights 10 of the main carrier-frames and may be locked thereto in positions of adjustment by set-screws 28. These supplemental frames are vertically adjusted by

means of screws 29, that engage ears 30 thereon, and are arranged to turn freely in ears 31 on the uprights 10, hand-wheels 32 being provided for turning them. The lower ends of the spindles 22 seat on set-screws 33 or on step-boxes supported by such screws, so that the spindles can be adjusted vertically independently of their boxes and carriers.

The vertical saws 9 are on arbors 34, which have their inner bearings in journal-boxes 35, directly over the carrier members 12, and their outer bearings in boxes 36, below the rearward extensions 3 of the machine-frame. These boxes are mounted on plates 37 and 38, that extend rearward from transverse bars 39, the inner ends of the bars and the plates 37 being secured by bolts 40 or otherwise to the carrier members 12. The boxes 35 and 36 are bolted or otherwise fastened to the ends of slide-bars 41, that ride on the surfaces of the underlying plates 39, and the boxes are in guideways 42 and 43, which enable them to slide inward and outward on their supporting plates 37 and 38 when actuated by the slide-bars 41. The bars 41 and the boxes and other parts they control are normally held at their inner positions by the pressure of springs 44. The ends of these springs bear against lugs 45 on the fixed bars 39 and against rings 46, secured on screws 47, which screws are arranged to pass freely through the lugs 45 and through the springs and to engage lugs 48 on the sliding bars 41. The screws have hand-wheels 49 for turning them to adjust the positions of the sliding bars 41 relative to the fixed bars 39.

The bottom supports for a box when presented to the saws consist of a pair of bars 50, each of which is provided with a series of small rollers 51, projecting above its surface. To the end portions of the bars 50 are attached upright plates 52, the lower portions of which abut the ends of horizontal holder-bars 53, to which they are adjustably connected by set-screws 54, passed through elongated slots 55 in the plates 52. Above the holder-bars 53 the plates 52 have screw-tapped lugs 56 overhanging the ends of the holders and are provided with screws 57, the ends of which bear on the bars and which in conjunction with the screws 54 enable the roller-carriers 50 to be vertically adjusted and held in place. For lateral adjustment of the roller-carriers their supporting-bars 53 are arranged to be movable lengthwise in the openings which receive them in the saw-frame members 12 and 13, respectively, and they are held in place by set-screws 58. By these means the roller-carriers for the support of the boxes to be trimmed are capable of both horizontal and vertical adjustment relative to the saws.

For the lateral guiding of the work at one of the sides (the right side in Fig. 1) of the middle of the machine a bar 59, carrying a series of rollers 60, portions of the faces of which project horizontally inward beyond its side, is mounted on a support consisting of

arms 61, diverging from a stem 62, the flat base 63 of which is fastened to the slide-bar 41. The connections of the bar 59 with the support-arms are made by means of screw-bolts 64 entering the former through vertical slots 65 in the flattened end portions 66 of the latter, whereby the bar may be set higher or lower when desired. The attachment of this guide-bar to the slide 41 causes the latter to be moved outward against the resistance of the springs 44 when sufficient pressure is exerted upon the guide-bar by the box, and thus the working parts at that side of the machine are adapted to yield as required in the operation of trimming a box. At the opposite side of the middle of the machine the initial guide-bar 67 is unyielding, being attached by a standard 68 to the top of the front extension 13 of the main saw-carrying frame; but the standard is made adjustable laterally by means of a slot 69 in its base, through which it is secured to the member 13 by a bolt 70. The guide 67 terminates at a point slightly beyond the middle of the horizontal saw, where it is abutted by the end of a yielding guide-bar 71, which extends rearward above the vertical saw. This guide, like the guide 59, is provided with rollers 69 to permit the box to be advanced freely to the saws, and it is carried on supports 61 and 62 and secured to the slide 41 in the same manner as the guide 59. Thus the guides 59 and 71 are arranged to yield outward by the like means and to the same extent when subjected to the pressure of a box advanced between them.

The saws are operated from driving-pulleys 72 in the rear of the machine by means of belts 73 connecting them with suitably-tapered pulleys 74 on the spindles 22 of the horizontal saws and by belts 75 connecting the driving-pulleys with the other pulleys 76 on the arbors 34 of the vertical saws. The several pulleys are relatively long, so that the belting may accommodate itself to the varying positions to which the saws may be moved.

For the protection of the operator the horizontal saws are partially covered by guards 77, suspended over them by holders 78, that are secured on the frame members 13 by the bolts 70.

The saws are attached to their spindles, preferably as shown in Figs. 6 and 7, by glands or dish-shaped plates 79 and 80, the former secured to the spindle back of the saw and the latter placed on the outside of the saw and clamped by the nut 81 of a screw-bolt 82, which engages in the screw-tapped end of the spindle. A convenient means is thus afforded for attaching and removing the saws without removal of other parts of the machine. The bolts 82 have central openings 83 for the passage of oil to recesses 84 below the bolts, and from the recesses ducts 85 in the spindles conduct the oil to the bearings. The journal-boxes 23 and 24 are also

provided with ducts 86 for the passage of oil to the bearings.

In operation a box, especially one whose corners are united by tongues and grooves and requiring trimming, is set on end between the guides 59 and 67 and on the rollers 51 at the front of the machine and is then pushed inward by the operator. If it is slightly wider than the normal distance between the guides the guide 67 will remain stationary, while the guide 59 will be pressed outward to the required extent. In passing over the saws 8 the projecting tongues will be removed from the lower surface of the box, and when the box is pushed farther along and engages the rollers on the guide-bar 71 the latter will yield to the pressure against it, and as the opposite guide is also a yielding bar held to its work by like spring resistance and as the pressure will be equal on both guides they will so adjust themselves that the box will pass approximately, if not absolutely, along the middle of the machine. The vertical saws being connected to their carriers so as to move in unison with the guides, the saws will cut off only the projecting tongues they were designed to cut and will not cut into the surfaces of the boards, as they would be liable to do if they were not arranged to be properly moved in harmony with the box-guides. This capability of the devices is found to be important in practice, for the reason that a considerable variation is found in the dimensions of machine-made boxes supposedly of the same size, and unless the corner-trimming machine is capable of self-adjustment to accommodate itself to such variations in some instances the tongues will not be entirely removed from the boxes and in others the surfaces of the boxes will be cut into. The ready adjustment of the various working parts of the machine in the manner set forth is also important, for it enables the machine as a whole to be quickly arranged for operating upon boxes of different sizes and adapts the more important parts to be conveniently adjusted or removed, as desired.

Having described my invention, what I claim is—

1. In a box-trimming machine, opposite horizontal and opposite vertical circular saws for successively trimming the under and side marginal surfaces of a box, a fixed and a yielding guide for directing the box to the former saws, and a second yielding guide co-operating with the first-mentioned yielding guide in directing the box to the vertical saws, the latter saws being arranged to be shifted by and in unison with the yielding guides, substantially as set forth.

2. In a box-trimming machine, opposite horizontal and opposite vertical saws arranged for successively trimming the under and side marginal surfaces of a box, supports on which the box is advanced, means for the horizontal and vertical adjustment of said supports relative to the positions of the saws, and lateral guides for directing the box to the saws, substantially as set forth.

3. In a box-trimming machine, opposite horizontal and opposite vertical saws arranged for successively trimming the under and side marginal surfaces of a box, supports on which the box is advanced, means for the horizontal and vertical adjustment of said supports relative to the positions of the saws, and adjustable yielding lateral guides for directing the box to the saws, substantially as set forth.

4. In a box-trimming machine, opposite horizontal and opposite vertical circular saws for successively trimming the under and side marginal surfaces of a box, a fixed and an adjustable yielding guide for directing the box to the former saws, and a second adjustable yielding guide co-operating with the first-mentioned yielding guide in directing the box to the vertical saws, the latter saws being arranged to be shifted by and in unison with the yielding guides, substantially as set forth.

In testimony whereof I have hereunto set my hand this 27th day of June, 1900.

JOHN E. ERICKSON.

In presence of—

P. H. GUNCKEL,  
W. LOHRBAUER.