May 3, 1938. W. F. NEWHOUSE 2,115,869

METHOD OF MAKING WIREBOUND BOXES

Filed Nov. 18, 1935 2 Sheets-Sheet 1

Fig. 1.

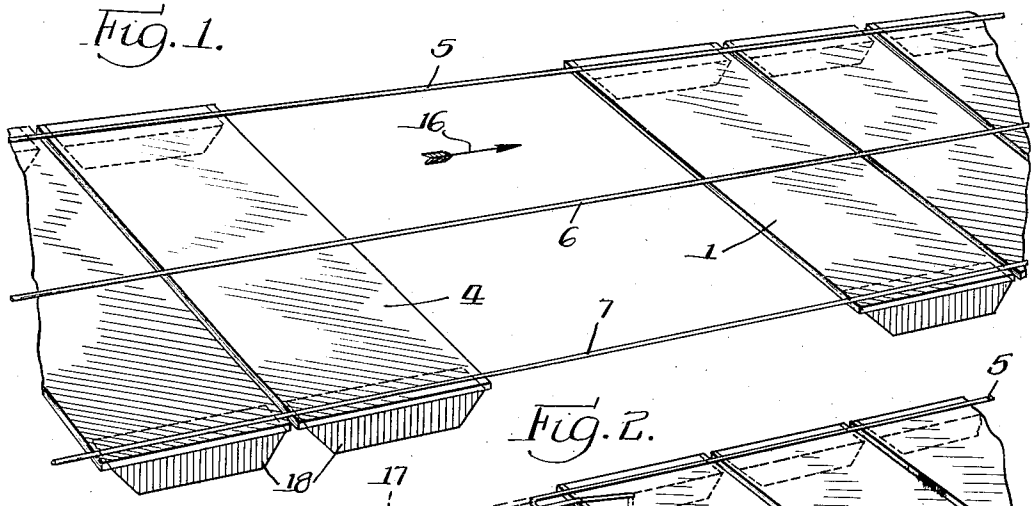


Fig. 2.

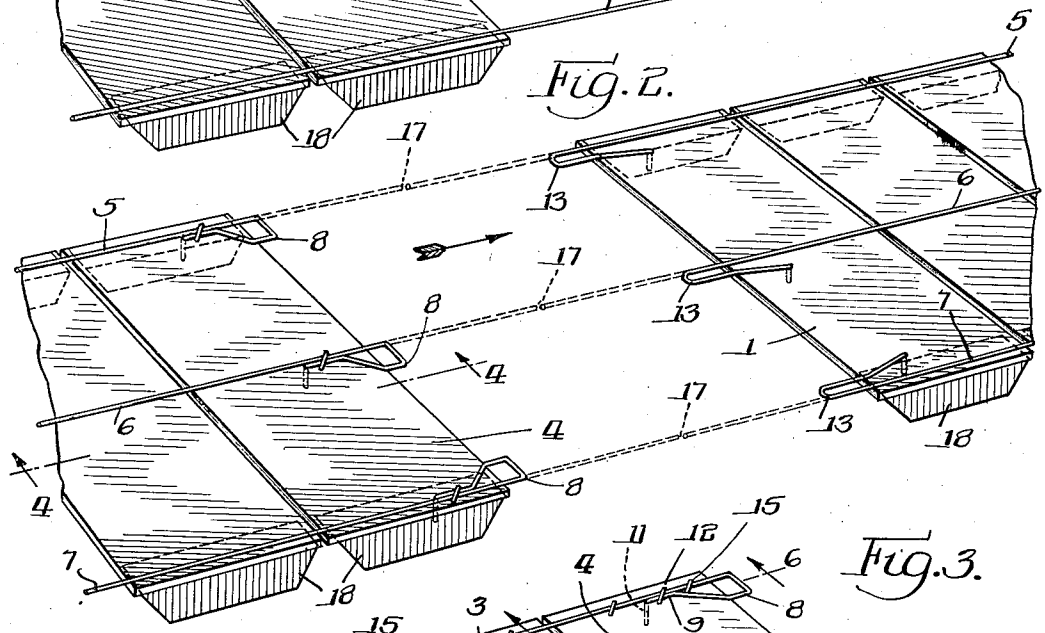
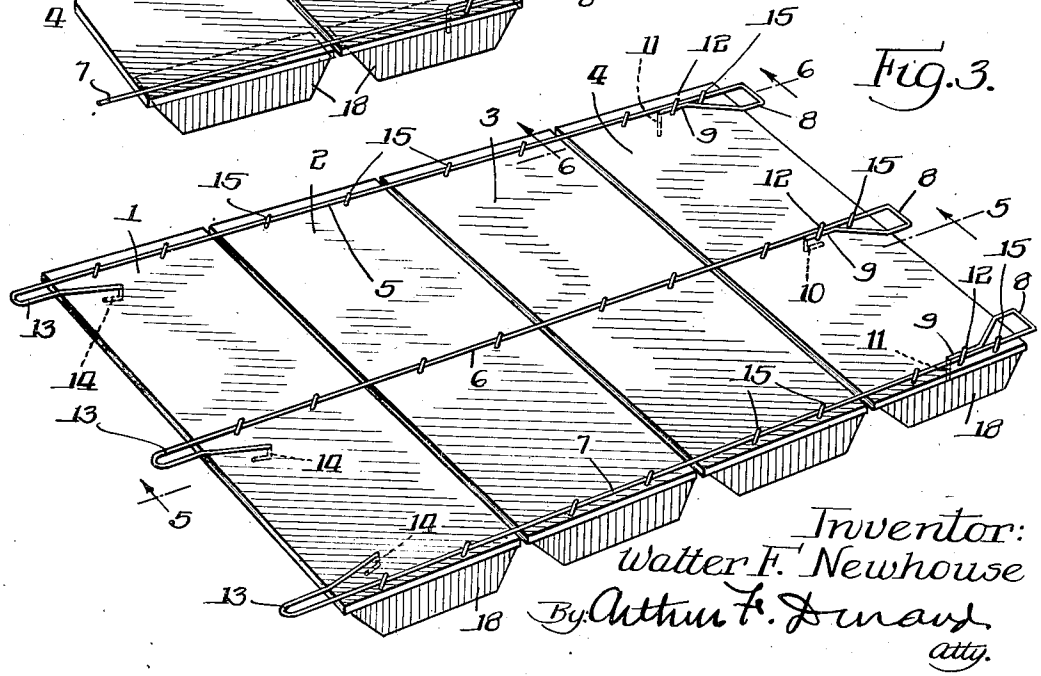


Fig. 3.



Inventor:
Walter F. Newhouse
By Arthur F. Durand
atty.

May 3, 1938. W. F. NEWHOUSE 2,115,869

METHOD OF MAKING WIREBOUND BOXES

Filed Nov. 18, 1935 2 Sheets-Sheet 2

Fig. 4.

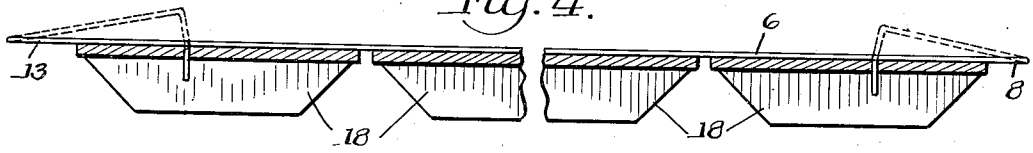


Fig. 5.

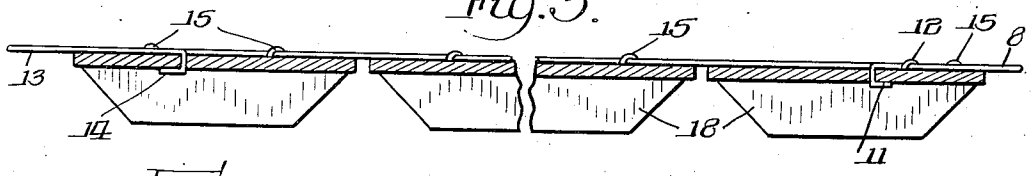


Fig. 6.

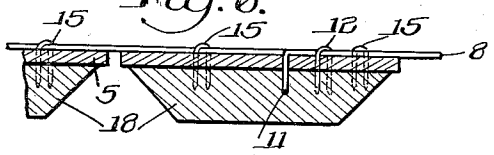


Fig. 7.

Fig. 9.

Fig. 8.

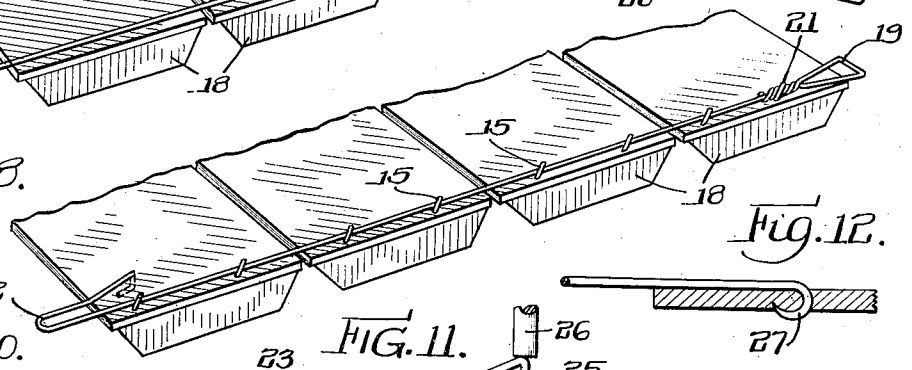


Fig. 12.

Fig. 10.

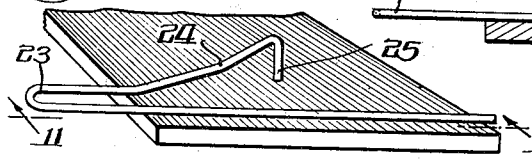


Fig. 11.

Inventor:
Walter F. Newhouse
By: Arthur F. Durand
atty.

Patented May 3, 1938 2,115,869

UNITED STATES PATENT OFFICE

2,115,869

METHOD OF MAKING WIREBOUND BOXES

Walter F. Newhouse, Benton Harbor, Mich.

Application November 18, 1935, Serial No. 50,278

16 Claims. (Cl. 140—93)

This invention relates to the manufacture of wirebound box blanks and wirebound boxes and crates, and more particularly to the provision of fasteners for the covers of the boxes or crates, on the opposite ends of the binding wires, thereby obviating the necessity of twisting the ends of the wires together, in the well known manner, and making it easy to open the box or crate at any time after it is filled or loaded for transportation.

Generally stated, the object of the invention is to provide a novel and improved construction and arrangement, and an improved process or method of construction, whereby the binding wires of the box or crate blank are first provided with loops, at opposite ends of each binding wire, before the wires are fastened to the blank, or at least before they are fully stapled in place, and whereby each fastener is thereafter secured to the blank, and the wires are thereafter stapled to the blank in the ordinary or any desired manner, thereby making it possible to advantageously cut or sever the wires between two successive blanks, prior to the usual stapling operation by which the wires are stapled to the different sections of each blank.

It is also an object to provide certain details of construction, and specific method or process steps, tending to increase the general efficiency and desirability of a box or crate blank having cover fasteners of this particular character, and of the said method or process for the manufacture thereof.

To the foregoing and other useful ends, the invention consists in matters hereinafter set forth and claimed and shown in the accompanying drawings, in which—

Fig. 1 is a perspective of the adjacent end portions of two successive box blanks with the three binding wires shown in position on the upper surface thereof.

Fig. 2 is a similar view, but in this case the binding wires have been cut between the two blanks, and the ends of these binding wires have been bent to form loops, and the latter have been fastened to the blanks.

Fig. 3 is a perspective of the blank shown at the left in Fig. 2, showing the three wires stapled to the sections of the blank in the usual manner.

Fig. 4 is a longitudinal section of the blank on line 4—4 in Fig. 2 of the drawings, on a larger scale, with certain portions shown broken away for convenience of illustration, illustrating the manner in which the loops are bent and formed with end portions that are ultimately forced into the material of the blank.

Fig. 5 is a similar section on line 5—5 in Fig. 3 of the drawings.

Fig. 6 is a fragmentary longitudinal section on line 6—6 in Fig. 3 of the drawings.

Fig. 7 is a view similar to Fig. 2 of the drawings, but showing a different form of the invention.

Fig. 8 is a perspective of a portion of a blank made by the method shown in Fig. 7 of the drawings.

Fig. 9 is an enlarged plan view of one of the loops shown in Figs. 7 and 8 of the drawings.

Fig. 10 is a perspective view illustrating another form of the invention.

Fig. 11 is a vertical section on line 11—11 in Fig. 10.

Fig. 12 is a view similar to Fig. 11, but showing a different form of the invention.

As thus illustrated, referring to Figs. 1 to 6 of the drawings, the box blank thus illustrated, as shown in Fig. 3, comprises the four cleated sections 1, 2, 3, and 4, connected together by three binding wires 5, 6, and 7, but it will be understood that the blank may comprise any desired number of sections, depending upon the shape or character of the box, and that it may have as many binding wires as are desired for any shape or size of box. At one end of the blank, the front end of the blank as it passes through the box blank making machine, each binding wire is provided with a loop 8, preferably a practically square-ended loop, as shown, with the end portion 9 of the wire lying snugly against the body of the wire. The extreme sharp end portion 10 of the wire, the middle wire, is inserted through the veneer and clinched on the under side of the latter. The loops of the two outside wires have sharp end portions 11 inserted downwardly through the veneer and into the cleat, as shown. Wide staples 12 are inserted to straddle the two parallel portions of the wire, each staple being preferably driven diagonally. At the other end of the blank, the ends of the binding wires are bent into hairpin shaped loops 13, each loop having its sharp end portion 14 inserted through the veneer and clinched. The usual staples 15 are inserted diagonally or obliquely over the three binding wires, and one of such staples, it will be seen, is in engagement with the straight side of each of the loops 8 previously described. In this way, each binding wire extends straight from the front edge to the rear edge of the blank, and

the loops are laterally offset, relative to the body of each binding wire, at each end of the blank.

Preferably, the blank shown and described, and the wire cover fasteners or loops for the ends of the wires, are made by the process or method indicated in Figs. 1 and 2 of the drawings. In Fig. 1, the sheets of veneer and the cleats and the binding wires are traveling to the right, in the direction indicated by the arrow 16, in any suitable machine for making the blanks. As indicated in Fig. 2, before any staples are driven, the wires are first severed at the points 17, over the space between the front section 4 of the rear blank, and the rear section 1 of the blank ahead. The end portions of the wires are then bent around to a position over their respective blanks, the extreme end portions of the wires are then bent downwardly, so that the previously described loops are formed, and these downwardly bent portions are then inserted in the front portion of the rear blank and in the rear portion of the blank ahead, in the manner shown in Fig. 2 of the drawings, and during such insertion of the end portions, the staples 12 are inserted, or these staples may be inserted afterward. In this way, the wires are cut, and the severed end portions are converted into loops, of the kind shown and described, before any stapling operations are performed on the blanks, whereby the wires are free to be cut and manipulated in an advantageous manner, before they are stapled to the blanks. Loop shaped cover fasteners are formed on the ends of the wires, while the latter are free and unstapled to the blanks, and thereafter staples are inserted in the first or leading blank, to secure the wires thereto, and thereafter the second or rear blank is then stapled in the same manner, to not only secure the wires to the blanks, but to also secure the sheets of veneer to the cleats 18 of the blanks.

When the blank shown in Fig. 3 is folded into box form, in the usual manner, the section 4 will serve as the cover, and the section 1 will serve as the front wall of the box. In such relation, the tongues formed by the hairpin shaped loops 13 are insertable upwardly through the square-headed loops 8, and the tongues 13 are then bent downwardly to form hooks, and this action will bend the loops 8 downwardly and toward the front wall of the box.

As shown in Figs. 7 and 8, the construction and method or process are substantially the same as previously described, but in this case the front or leading loops 19, on the forward end of each blank, are formed by twisting the two sides of the loop together at 20, to form a stout twist with the end of the wire rubbed down smooth. Preferably, a diagonal or oblique staple 21 is inserted over each twist.

Thus, in each form of the invention, the forward or leading loop on the front end of each binding wire, at the front end of each blank, which is the cover section of the blank, has an extra staple (the staple 12 in Fig. 3, and the staple 21 in Figs. 7 and 8) to assist in preventing this loop from pulling out, when the tongues and eyes, so to speak, of the fasteners thus provided, are hooked together in the manner explained. In Fig. 7, the loops 19 are uniform, in their relation to the front edge of the blank, but in Fig. 3 it will be seen that two of these loops, the one at the upper edge and at the middle, have the same relation to the blank, but that the third loop, at the lower edge of the blank, extends laterally in the opposite direction.

With either form of the invention, the blank is foldable in the ordinary and well known manner, into box shape, and in Fig. 3 the tongues 13 are insertable through the loops 8, and these tongues are bendable to provide hooks to keep the cover closed. In the same way, in Fig. 8, the loops or tongues 22 are insertable through the loops 19, and are bendable to form hooks to keep the cover closed. With each form of the invention, the hooks can be straightened out, if desired, to permit the opening of the cover, in order to inspect the contents of the box. The wires are preferably made of metal that will stand considerable bending, without breaking, so that the box can be opened and closed several times, if necessary, without danger of breaking or injuring the wire cover fasteners thus provided.

In the commercial manufacture of box blanks of this kind, the cutting and bending of the wires, in the manner shown and described, can be done by any suitable machinery. It could be done by hand, of course, but that would be too slow and expensive, and hence cutting and bending mechanism will be employed, of any suitable character, preferably on the box blank making machine, to cut and bend the wires, and insert the ends in the blanks, in the manner shown and described, before the blanks pass under the usual staplers of a machine of this kind. In other words, these wire loops, as shown and described, will be formed while the blanks are approaching the staplers, instead of after the blanks have passed under the staplers and have had the wires secured to successive blanks. Therefore, with the method shown and described, for relatively short blanks, the cutting and bending between successive blanks may be accomplished before the forward end of the front or leading blank has reached the staplers, and in such case the loops for the front and rear ends of the blank will have been made before any staples are driven over the wires, except possibly the relatively wide staples 12, which latter may be driven at the time of the cutting and bending, or at any time afterward. However, box blanks are of different shapes and sizes, and some are relatively long, and a relatively long blank will not only have had its front end loops formed, but may have had a substantial portion of its length, the front portion thereof, stapled by the usual staplers of the blank making machine, before the wires are cut and bent at the rear end of the blank. Therefore, the cutting and bending between blanks is done prior to at least some of the stapling of the wires on the front or leading blank, and in some cases before any stapling thereon, depending upon the length of the blanks.

It will be understood, of course, that successive blanks may move forward in unison, by continuous or unbroken motion, or that they may have a forward feeding motion, depending upon the type of machinery employed for that purpose. In any event, as shown and described, the cutting and bending of the wires is all accomplished while the blanks are approaching the stapling position, and while the blanks are travelling, either by continuous or intermittent motion, toward the staplers of the machine upon which the blanks are made. By this method, it is found that the problem of cutting and bending is somewhat simplified, as the mechanism for doing this may operate upon wires that are not restrained by any staples adjacent the rear end of the for-

ward blank and adjacent the front end of the following blank. In this way, as explained, the bends or bights in the loops, between the adjacent ends of blanks, are advantageously formed first, and the relatively short vertical end portions of the wires, to be inserted in the materials of the blanks, are then formed afterward.

As illustrated in Figs. 10 and 11, the end portions of the wire, forming the loops 22, instead of being bent and driven as shown in Fig. 4, may be bent horizontally at 23, and then upwardly as shown at 24, and then downwardly as shown at 25, so that the driver indicated at 26 may exert a direct perpendicular thrust on the portion 25 which is to be inserted through the veneer.

Also, as shown in Fig. 12 of the drawings, the inserted end portion of the wire may be clinched and bent upwardly into the veneer, as is the portion 27, so that no sharp end of the wire will be exposed on either the upper or lower surface of the veneer.

In use, the box blanks of the kind shown and described are found to have strong and reliable fasteners, as the relatively broad loops on the cover section of the blank are strong and not likely to pull out when they are bent sharply and forcibly downward by the bending of the narrow loops which form the tongues on the front wall section of the box. In bending the tongues downwardly to form hooks, there is considerable leverage exerted, and considerable pull exerted on the cover loops, but the latter are so strongly anchored that they are not likely to be pulled out when the box is loaded and then closed in this manner. But, of course, the relatively narrow loops forming the hooks can be readily bent upwardly or straightened out, when it is desired to open the box for inspection of the contents, by using wire of the proper gauge and quality of metal, without danger of accidental opening of the box in transportation.

While the invention has been shown in connection with a wirebound box blank, it is obvious that wirebound crates may be made by the same process or method, and provided with the same kind of fasteners, and wherever the term "box blank" is employed, it is to be understood that this means either a box with tight sides, or a crate having spaces or openings in the sides thereof, for either one is practically a wirebound box.

Also, while the invention has been shown and described in connection with covers, such as the top cover of a wirebound box or wirebound crate, it will be understood that the fasteners shown and described may be employed on a closure of any kind, a container closure of any kind, wherever applicable, without departing from the spirit of the invention.

In effect, the relatively wide loops 8 are what may be called eye loops, while the relatively narrow loops 13 are what may be called tongue loops, with each tongue loop adapted to be inserted in an eye loop on the opposite end of the length of wire. The wires are cut into lengths suitable for the box or crate, before the wires are fastened to the box or crate parts, and preferably wire fasteners of the kind shown and described are formed on the ends of the lengths of wire, before such lengths are stapled or otherwise fastened to the box parts.

Of course whether or not any staples are driven in the front of two successive blanks, before the wires are cut, depends upon where the stapling position is located. If the stapling position is close to the space between the two ends, some staples may be driven into the front blank, before the wires are cut, between the two blanks; but if the stapling position is the length of a blank or more, ahead of the wire cutting position, then no staples will be driven in either blank before the cutting of the wires between the two blanks; it depends more or less on the size or length of the blank made; but in any case no staples are driven in the second blank before the wires are cut between the two blanks.

What I claim as my invention is:

1. The process of making wirebound box or crate blanks, by feeding the blanks successively into position to have the wires secured thereto by the insertion of staples, comprising the cutting of the wires between the adjacent ends of two successive blanks before the wires are stapled to the second blank, stapling the wires to the second blank, thereafter cutting the wires between the rear end of the second blank and the front end of the next or third blank, thereafter stapling the wires to the third blank, and repeating said cutting and stapling operations for each succeeding blank.

2. A process as specified in claim 1, comprising the formation of loops on cut ends of the wires, projecting from the ends of the blanks, before the space between the blanks passes through the stapling position.

3. A process as specified in claim 1, comprising the insertion of cut ends of the wires in the blank, before the space between the blanks passes through the stapling position.

4. A process as specified in claim 1, in which wire ends are clinched on the under side of each blank, before the space between the blanks passes through the stapling position.

5. A process as specified in claim 1, in which loops are formed on wire ends, and the ends of the wire of each loop is thereafter bent for insertion in the blank, before the space between the blanks passes through the stapling position.

6. A process as specified in claim 1, in which no wire holding staples are inserted in the first blank before said first-mentioned cutting operation is performed.

7. A process as specified in claim 1, in which some wire holding staples are inserted in said first blank before said first mentioned cutting operation is performed.

8. A process as specified in claim 1, in which loops are formed on cut ends of wires, at the cutting position, for each blank, before the space between the blanks passes through the stapling position.

9. The process of making wirebound box or crate blanks, by feeding blanks successively into position to have the wires secured thereto by the insertion of staples, comprising the cutting of wires between successive blanks, before the wires of the rear blank are stapled in place, the forming of loops on wire ends, and thereafter bending the end of the wire of each loop and inserting it in the blank.

10. A process as specified in claim 1, comprising the stapling of loop fasteners to the blank.

11. A process as specified in claim 1, comprising the clinching of the end of said inserted end against the inner side of the blank, before the space between the blanks passes through the stapling position.

12. The process of making wirebound box or crate blanks, by feeding the blanks successively into position to have the wire stapled thereto,

comprising the formation of loop cover fasteners on adjacent ends of blanks before the space between said ends passes through the stapling position.

13. A method as specified in claim 12, comprising the bending back of the end of the wire, to form the loop, and the insertion of a staple over said bent back end portion.

14. A method as specified in claim 12, comprising the bending back of the end of the wire, to form the loop, and the insertion of a staple over said bent back end portion, said bent back end portion being twisted around the body of the wire before the insertion of said staple.

15. A method as specified in claim 12, comprising the bending back of the end of the wire, to form the loop, and the insertion of a staple over said bent back end portion, the bent back portion of the wire being placed against and parallel with the body of the wire, for a distance, before the insertion of said staple over the two parallel engaging portions of wire.

16. A method as specified in claim 12, comprising the insertion of the end of the wire in the blank, to form the loop, before said space reaches said position.

WALTER F. NEWHOUSE.