(No Model.) 3 Sheets—Sheet 1.

C. F. DARNELL & L. KOSS.

LATH MACHINE.

No. 524,057. Patented Aug. 7, 1894.

Fig. 1.

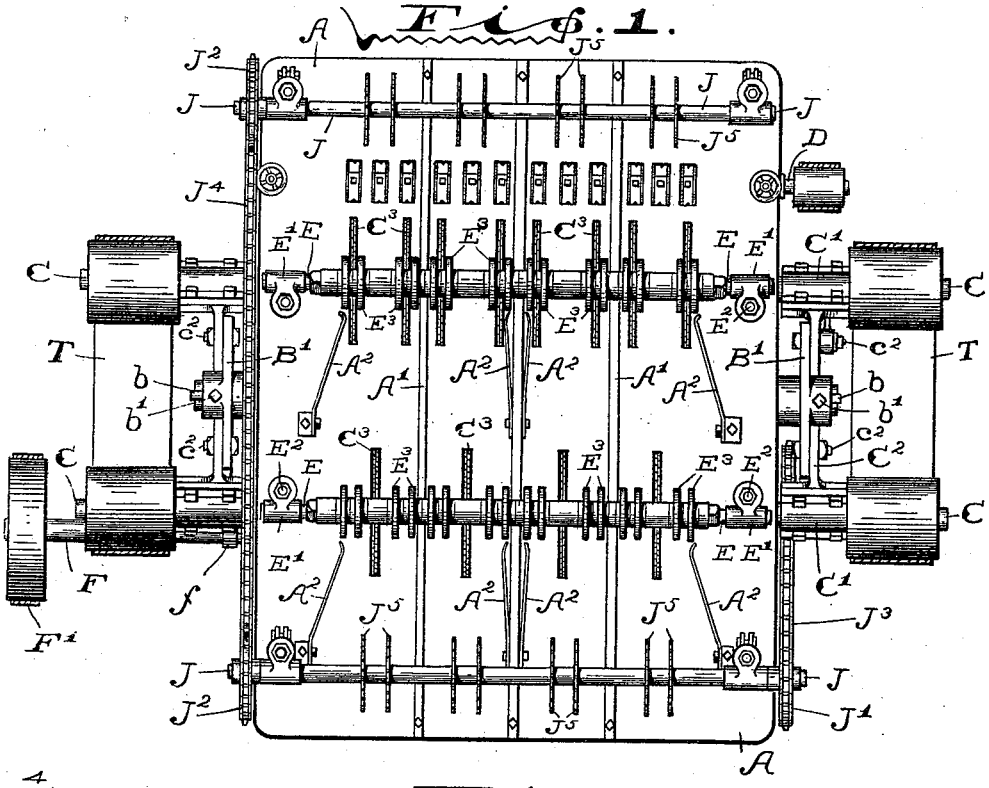

Fig. 2.

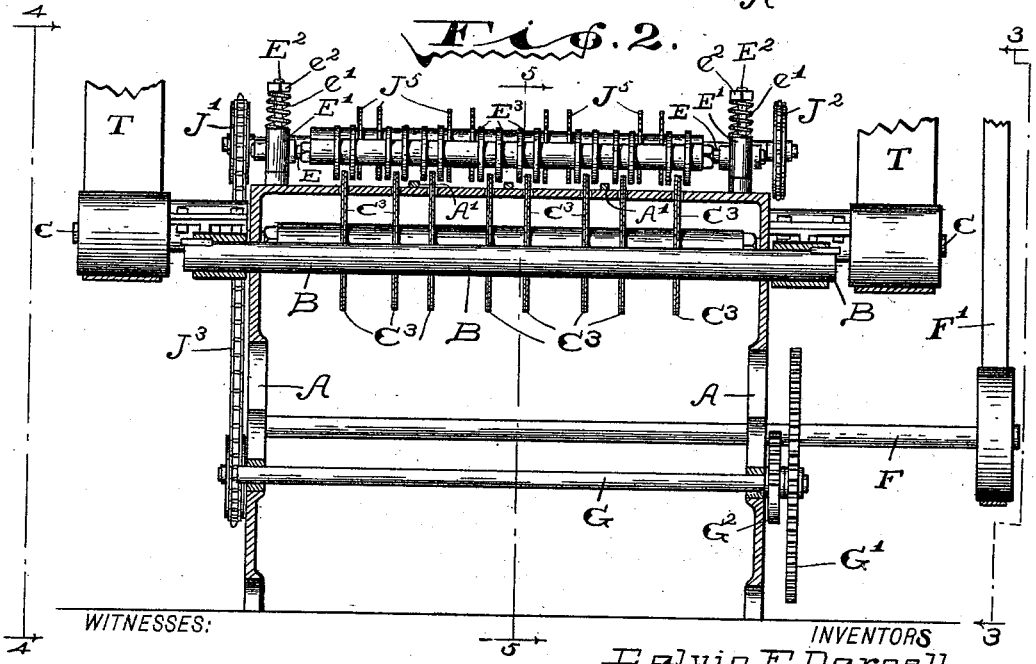

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Fig. 3.

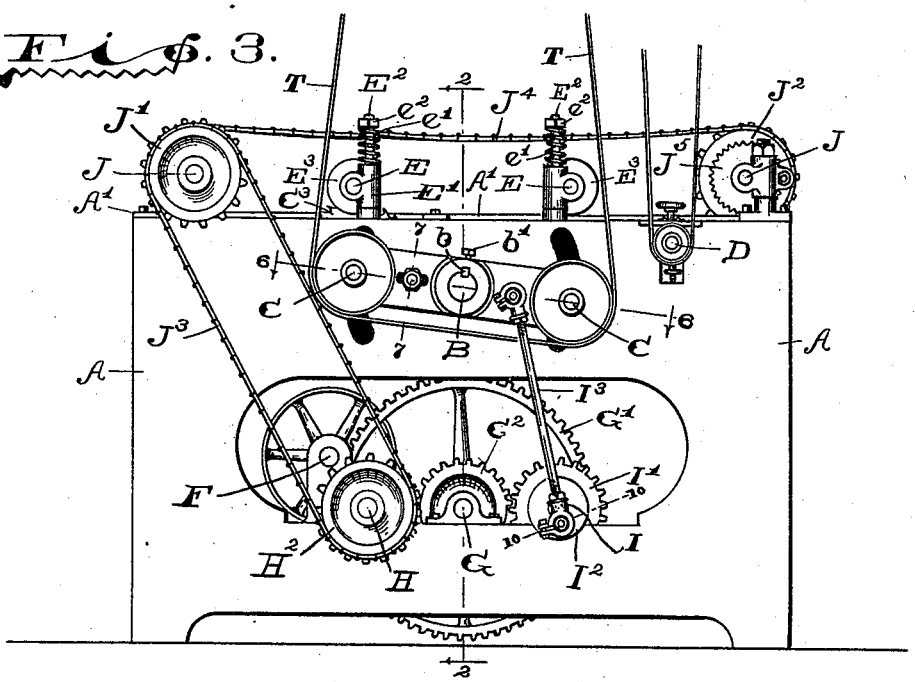

Fig. 4.

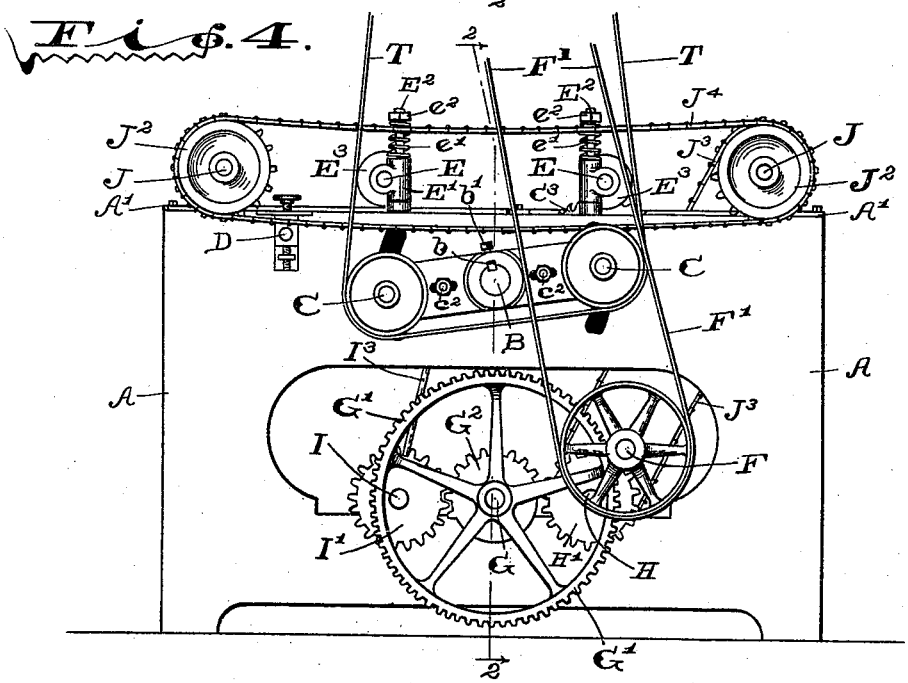

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Fig. 5.

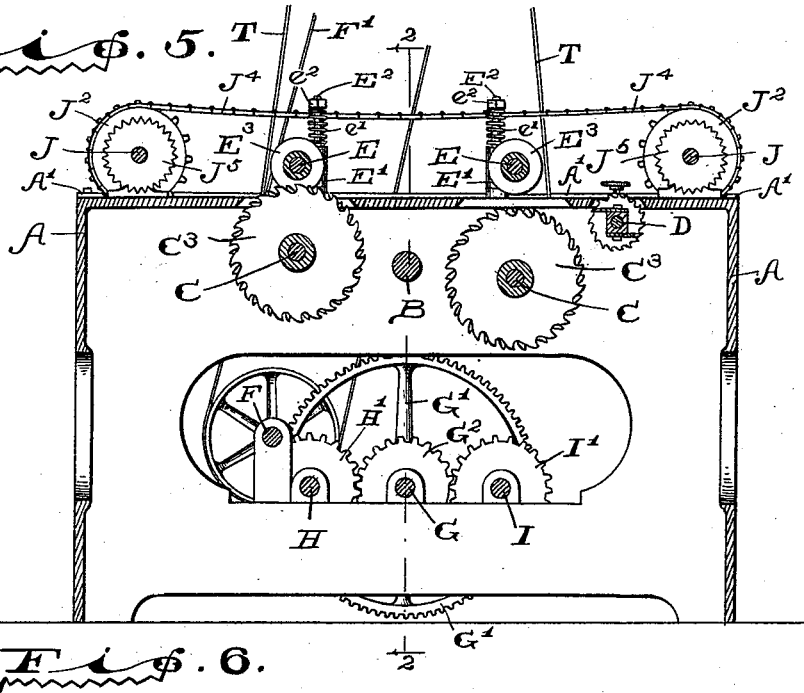

Fig. 6.

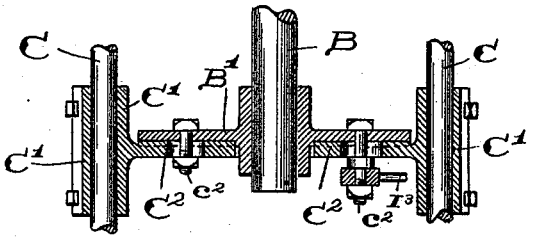

Fig. 7.

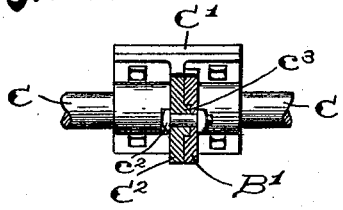

Fig. 8.

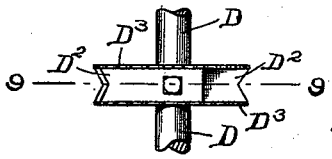

Fig. 9.

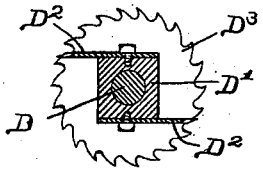

Fig. 10.

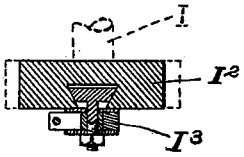

Fig. 11.

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UNITED STATES PATENT OFFICE.

CALVIN F. DARNELL AND LOUIS KOSS, OF INDIANAPOLIS, INDIANA, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE INDIANAPOLIS LATH MACHINE COMPANY, OF SAME PLACE.

LATH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,057, dated August 7, 1894.

Application filed July 31, 1893. Serial No. 481,954. (No model.)

To all whom it may concern:

Be it known that we, CALVIN F. DARNELL and LOUIS KOSS, citizens of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Lath-Making Machines, of which the following is a specification.

The object of our said invention is to produce a machine for forming wooden lathing from boards, by sawing slits therein which shall have a staggered or overlapping relation to each other.

A machine embodying said invention will first be fully described and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a top or plan view of a machine embodying our said invention; Fig. 2 a central vertical sectional view of the same as seen from the dotted lines 2 2 in Figs. 3 and 4; Fig. 3 an end elevation of the right hand end of the machine as seen from the dotted line 3 3 alongside Fig. 2; Fig. 4 an end elevation of the left hand end of the machine as seen from the dotted line 4 4 alongside Fig. 2; Fig. 5 a central longitudinal sectional view as seen from the dotted line 5 5 in Fig. 2; Fig. 6 a detail horizontal sectional view on a somewhat enlarged scale as seen from the dotted line 6 6 in Fig. 3; Fig. 7 a transverse detail sectional view on the dotted line 7 7 in Fig. 3; Fig. 8 a detail top or plan view of one of the grooving cutter heads, on an enlarged scale; Fig. 9 a central sectional view of the same; Fig. 10 a detail elevation of the crank wheel which drives the pitman, as seen from the dotted line 10 10 in Fig. 3, and Fig. 11 a transverse sectional view of a fragment of lathing made on this machine.

In said drawings the portions marked A represent the frame-work of our improved lath machine; B a central rock shaft; C the mandrels for the saws; D the mandrel for the cutter head; E shafts carrying pressure rolls or disks by which the lumber is held firmly onto the table while being sawed; F a driving shaft from which the feeding and shifting mechanism is driven; G a counter shaft; H a shaft intermittingly driven from the counter shaft by which the feeding mechanism is driven; I a shaft intermittingly driven from the counter shaft by which the saw shifting mechanism is operated, and J shafts to feeding disks whereby the lumber is driven through the machine.

The frame A is preferably of cast iron, of a strong and rigid construction, and the top consists of a smooth table, having slots for the saws and cutters to extend through, as shown most plainly in Figs. 1 and 5. Upon this table are guide strips A′ against which the edges of the boards from which the laths are to be formed will bear, and on the opposite sides of the paths of said boards are springs A^2 by which said boards are held against said guide strips A′ and thus guided accurately through the machine. The frame is also provided at appropriate points with bearings for such of the shafts as are mounted directly thereon, as shown.

The rock shaft B is centrally mounted in bearings in the frame A, and has upon its ends the cross arms B′, which, in turn, support and carry the bearings for the mandrels C, as shown, and as will be presently more fully described. Said cross-arms are secured upon said shaft by means of keys *b*, and set screws *b*′ in the hubs of the cross-arms are adapted to press upon and secure said keys in position. By this means said hubs may be placed upon said shafts loosely enough so that by loosening said set screws they can be readily removed without removing said rock shaft from the machine, and thus the saw mandrels are permitted to be taken out, for the purpose of removing, replacing or re-adjusting the slitting saws thereon, very easily and quickly.

The saw mandrels C are mounted in bearings C′ which are secured to the cross-arms B′ by means of wings C^2 thereon, and which are united to said cross-arms by means of bolts c^2. The desired distance is thus secured between the sets of saws. These bearing wings are rendered adjustable on said cross arms by one of the parts being slotted, and thus the mandrels C can be adjusted nearer to or farther from the rock shaft B as may be desired, so that the saws may be caused to move a greater or less distance up through the slots in the table of the frame A. This

not only permits the required adjustment when setting up the machine, but also enables it to be further adjusted from time to time as the saws wear away. Ribs c^3 and corresponding grooves keep the wings from swinging on the arms. Upon these shafts C are mounted the grooving saws C^3 which cut slits through the material being operated upon, and thus form the laths. It being the object to produce slitted lathing having the adjacent slits overlapping or extending past each other, manifestly it is necessary to have two sets of saws, the saws of one set being arranged intermediate of those of the other set, and a machine having saws thus arranged is a principal feature of our invention. The driving shaft for these saws is not shown, but is generally to be located above or below the machine, perpendicularly over or under the rock shaft B, so that, as said rock shaft moves and the saw mandrels are alternately raised and depressed, the belts T which drive said mandrels will maintain a uniform tension, notwithstanding the shifting positions of said mandrels, as will be readily understood. A different position of the driving shaft will commonly involve the use of idler pulleys.

Besides slitting the lumber into lath widths by means of the saws, it is desirable that at the point where the plaster is applied, it should all be of uniform thickness. Where the lumber is of a thickness greater than is desirable for lathing there should therefore be provided some means by which the surplus thickness may be removed alongside the slits. We have therefore provided cutter heads mounted upon the shaft D (which will presently be described in detail) to perform this service. By this means we produce a stiff strong lathing by which (in buildings of the cheaper sort) the usual lining may be dispensed with, and the building still made comparatively stiff and strong. That is, laths are usually three-eighths of an inch thick, while boards may be of any thickness desired, such as five-eighths, seven-eighths, or one inch. The slits are first cut by the saws, and then afterward a portion of the lumber alongside the slits is cut away by these cutter heads to a depth which will leave only the required three-eighths of an inch for the plaster, and forming grooves, at the central portions whereof the slits are formed, as shown in Fig. 11. It is also desirable to cut away the wood slightly lower at the sides of these grooves than at the edges of the slits, so that the plaster may clinch over behind the lips thus formed somewhat, and this we do by the form of the cutter head knives shown most plainly in Fig. 8, producing a lath as shown in Fig. 11. The cutter head itself consists substantially of an ordinary plain head D′ having cutters or knives D^2 the cutting edges of which are beveled from each side toward the center, and small saws D^3 forming the sides of said head, and of the same diameter as the cutters or knives, as plainly shown in Figs. 8 and 9.

The shafts E are preferably mounted directly above the mandrels C in bearings E′ on rods E^2, between heads or nuts e^2 thereon and the top of said bearings are springs e', whereby said bearings and the shafts and pressure rollers or disks are held down in contact with the lumber being operated upon. It is preferable that these pressure rollers should be in the form of disks E^3, as shown, in order that they may be located directly above the mandrel of the saws, and thus press upon the lumber directly above where the saws come up against it. They are also lighter and less expensive than solid ones would be, besides leaving spaces for the saw dust. They may, however, of course be of a different form if desired, although they then would need to be located in a plane somewhat to one side of the mandrels.

The shaft F is an independently driven shaft whereby the feeding and shifting apparatus is operated, and is mounted in suitable bearings in the frame A, and is driven by a belt F′ from any suitable driving shaft (not shown). Upon this shaft is a small pinion f which meshes into a large spur gear on the counter shaft G, and thus drives said counter shaft.

The counter shaft G is centrally mounted in suitable bearings in the frame-work A, and is driven by means of the pinion f and spur gear G′, and is further provided with the segmental gear G^2. This segmental gear is adapted to engage with first one and then the other of corresponding spur gears H′ and I′, mounted, respectively, on the shafts H and I, and thus impart motion to first one and then the other of said shafts. It being necessary that the series of slits formed by the saws should leave short connecting pieces between the laths, much shorter than the length of said slits, it will be seen that first one series of slits must be cut, and then another series, intermediate of the first series, which shall overlap said first series. It is for this reason that the two mandrels and sets of slitting saws are provided. Manifestly, however, while the rock shaft and its arms are being rocked, and one set of saws is being thus withdrawn from operation and the other moved up into operation, it will not do for the lumber to be fed forward, as, if it was, the slits would not be cut entirely through said lumber, and, on the other hand, while the saws are in proper position for cutting, and the feeding mechanism is in operation, manifestly the rocking motion, whereby said saws are shifted, must cease; and this is accomplished by the intermitting movements secured by the segmental gear operating first upon the shifting mechanism and then upon the feeding mechanism.

The shifting mechanism having been operated, and one set of saws having been thus

raised up through the slots in the table to operative position, the shaft H is revolved by the segmental gear G^2 engaging with the spur gear H′, and this by means of sprocket wheels H^2, J′ and J^2, and chain belts J^3 and J^4 drives the shafts J of the feed disks during a period sufficient to move the lumber forward a distance equal, plus the diameter of the portions of the saws extending through the table, to the length of the slits desired. When the cogged segment G^2 has escaped from the spur gear H′, manifestly the forward movement of the feeding apparatus ceases. The shaft I is then driven by the cogged segment G^2 engaging with the spur gear I′ thereon, and this operates through the crank wheel I^2 and pitman I^3 to swing the arms B′ and rock shaft B, lowering the saws which have just been at work out of operative position, and raising the others through the slots in the table to position to operate. The feeding mechanism comes into operation upon this being done, and the operation above described is repeated. The pitman I^3 is adjustably attached to the crank wheel I^2, so that the stroke may be lengthened or shortened, and the saws thus raised and lowered a greater or less distance. By this means some control can be had over the length of the slits to be cut in the lathing, and this adjustment is easily made, as well as the adjustment of the bearings for the saw mandrels on the cross-arms as the saws wear away.

The shafts J are mounted in suitable bearings on the frame-work, and one of them bears sprocket wheels J′ and J^2, and the other a sprocket wheel J^2 only. They both bear feeding disks J^5 which are preferably in the form of saws, with blunt teeth, although they may be of any form desired, and which are adapted to engage with and feed the lumber forward while the saws are in operation. The bearings for these shafts J are shown as of a similar construction to those for the shafts E except that no springs are used, (these being usually unnecessary with this form of feeding disk,) but any desired form may of course be used.

Having thus fully described our said invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a lath making machine, of a suitable frame-work, two mandrels carrying sets of slitting saws, the saws upon one mandrel being arranged intermediate those upon the other mandrel, and mechanism whereby first one set and then the other set of said saws are caused to operate upon the lath material.

2. The combination, in a lath making machine, of a suitable table having slits therein, two saw mandrels driven in the same direction mounted below the surface of said table and each bearing a series of slitting saws, and mechanism whereby first one and then the other is raised and the saws thus alternately projected up through the slits in the table.

3. The combination, in a lath making machine, of two sets of slitting saws, mechanism whereby the sets are alternately brought into operation, and intermittingly moving feeding mechanism.

4. The combination, in a lath making machine, of a slitted table, two saw mandrels mounted in bearings below said table, staggered or intermediately arranged saws thereon a rock shaft having arms upon which said bearings are mounted, and mechanism whereby said shaft may be rocked and the sets of saws thus alternately raised through the slits in the table into operative position, substantially as set forth.

5. The combination, in a lath making machine, of a table having slits or mortises therein, saw mandrels bearing sets of slitting saws adapted to enter said slits or mortises and cut the material passing over said table into lath by forming slits therein, feeding mechanism for feeding the material forward over said slits or mortises, and mechanism whereby first one mandrel and then the other is driven toward said table and the cutting edges of the saws thus caused to operate upon the lumber, at the same time entering the slits or mortises in the table, substantially as set forth.

6. The combination, in a lath making machine, of the frame-work or table, two saw mandrels, a central rock shaft, arms upon said rock-shaft, and bearings for the mandrels adjustably secured upon said arms.

7. The combination, in a lath making machine, of a central rock shaft, cross arms thereon, bearings having wings attached to said arms, said parts being provided with grooves, slots and bolts uniting the same whereby they are securely but adjustably secured together, and saw mandrels, bearing the slitting saws, mounted in said bearings.

8. The combination in a lath making machine, of a central rock shaft, cross-arms on said rock shaft carrying the mandrels of the slitting saws, keys between the hubs of said cross-arms and said shaft, and set screws in said hubs adapted to be driven against and secure said keys in position, said cross-arms thus being rendered conveniently removable from said rock shaft, substantially as set forth.

9. The combination, in a lath making machine, of a table over which the lath material passes provided with slits for the saws, a rock-shaft, cross-arms thereon, bearings carried by said cross-arms for the saw mandrels, said saw mandrels and saws thereon, a pitman whereby said cross-arms are operated, a crank-wheel for said pitman, and means for adjusting the stroke of said pitman whereby the saws may be projected a greater or less distance through

the slits in the table, and the length of the slits in the material being cut into laths thus determined, substantially as set forth.

10. The combination of the table or framework, the central rock-shaft, the cross-arms thereon, bearings on said cross-arms, mandrels mounted in said bearings, gangs of slitting saws mounted on said mandrels, a pitman attached to one of said cross arms, an intermittingly moving shaft carrying the crank wheel to said pitman, feeding mechanism, an intermittingly moving shaft for driving said feeding mechanism, and driving shafts from which said several parts are operated, the whole forming a lath making machine, substantially as set forth.

11. The combination, in a lath making machine, of the two sets of saws, the feeding mechanism, the driving shaft therefor, mechanism for shifting the saws into and out of operation, a driving shaft therefor, each of said driving shafts being provided with a spur gear, an intermediate counter shaft, and a segmental gear thereon adapted to engage alternately with the gear on the shaft of the feeding mechanism, and with the gear on the shaft of the saw shifting mechanism.

12. The combination, in a lath making machine, of the table, the slitting saws, the holding and feeding mechanism, and cutter heads arranged across the path of the slitting saws and thus adapted to cut grooves, wider than the slits, in the surface of the material being formed into laths, thus cutting down the material on both sides of the slits, substantially as and for the purposes set forth.

13. The combination, in a lath making machine, of the slitting saws for forming the laths, and cutter heads arranged to cut grooves alongside said slits, said cutter heads being composed essentially of knives having the center of the cutting edge cut back or V-shaped, whereby lips are formed alongside the slits in the lath material, over which the plaster will lock, substantially as shown and described.

In witness whereof we have hereunto set our hands and seals, at Indianapolis, Indiana, this 20th day of July, A. D. 1893.

CALVIN F. DARNELL. [L. S.]
LOUIS KOSS. [L. S.]

Witnesses:
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JAMES A. WALSH.