2 Sheets—Sheet 1.

N. SHAW & D. KENNEDY.

MACHINE FOR MAKING LATH.

No. 187,323. Patented Feb. 13, 1877.

Fig 1.

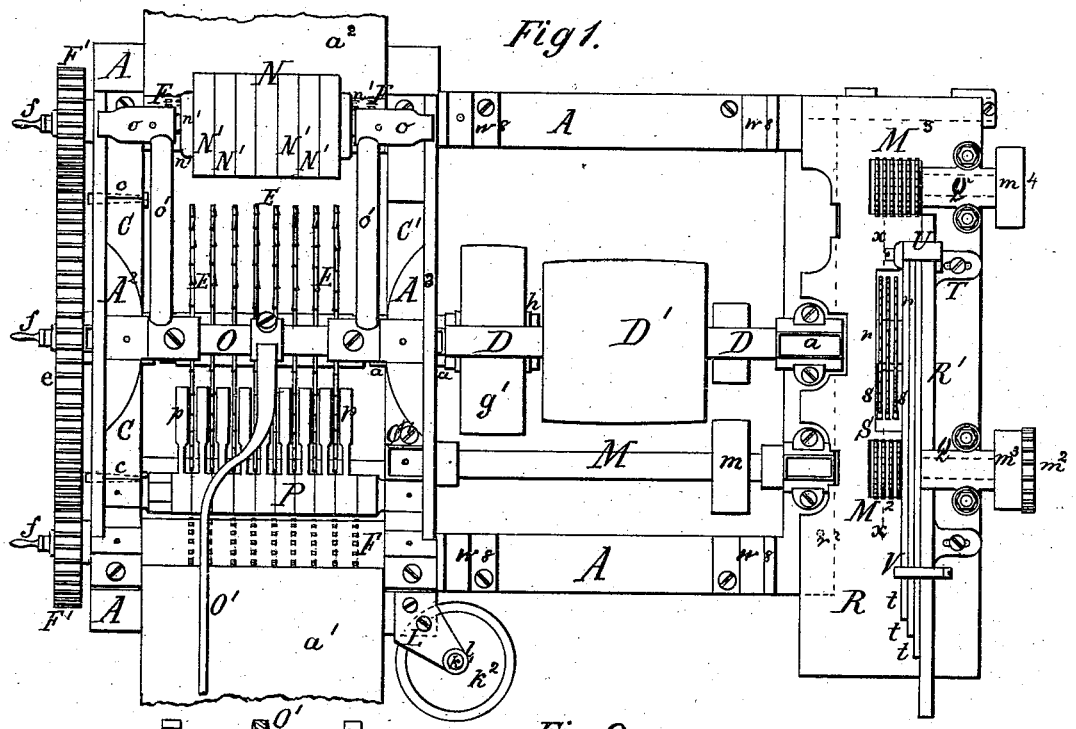
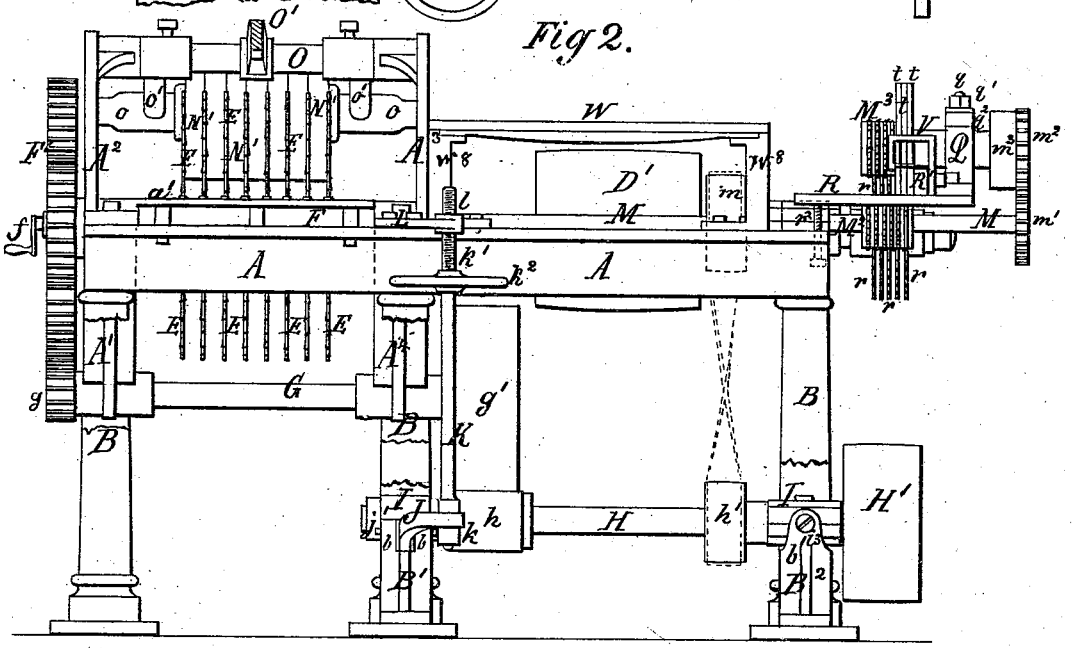
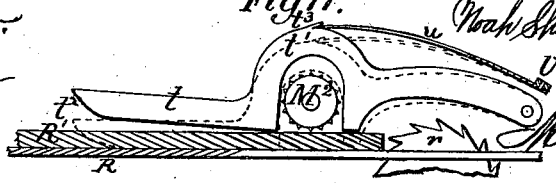


Fig 2.



Witnesses:
James Mattey Jr.
J. S. Theodore Lang

Fig 11.



Inventors.
Noah Shaw & Donald Kennedy
by
Munson, Fenwick & Lawrence.

2 Sheets—Sheet 2.

N. SHAW & D. KENNEDY.

MACHINE FOR MAKING LATH.

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Fig 3.

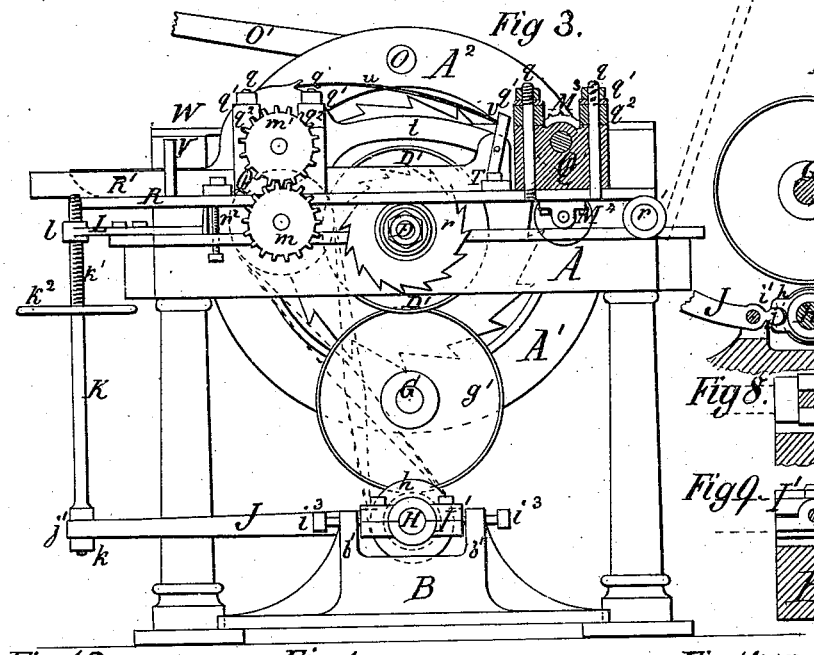


Fig 7.

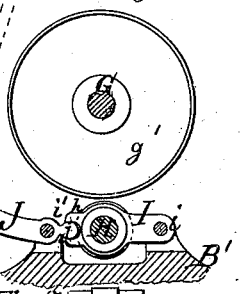


Fig 8.

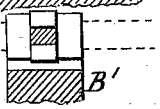


Fig 9.

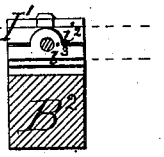


Fig 12.

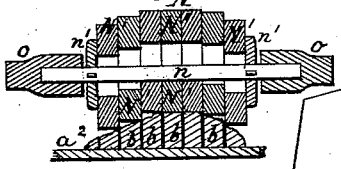


Fig 4.

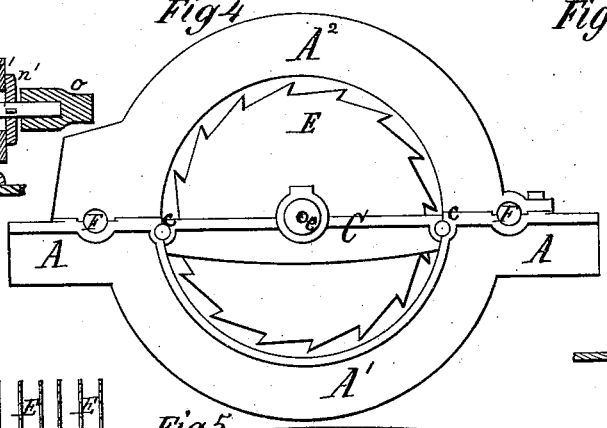


Fig 14.

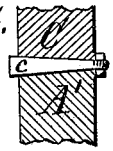


Fig 10.

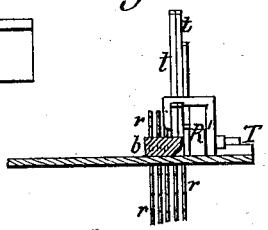


Fig 5.

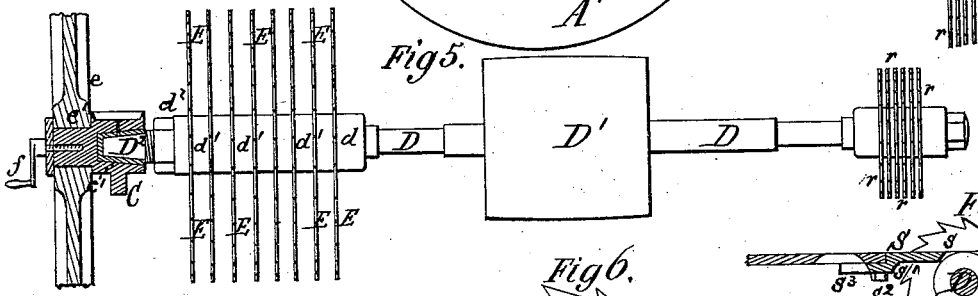


Fig 13.

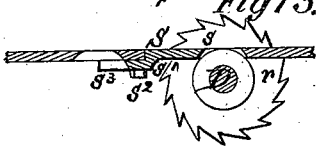
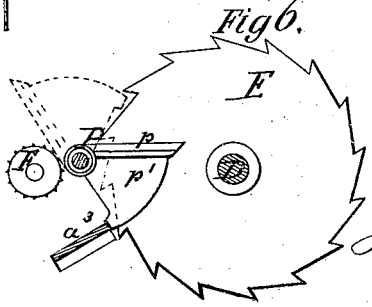


Fig 6.



Witnesses:
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UNITED STATES PATENT OFFICE

NOAH SHAW AND DONALD KENNEDY, OF EAU CLAIRE, WISCONSIN.

IMPROVEMENT IN MACHINES FOR MAKING LATHS.

Specification forming part of Letters Patent No. **187,323**, dated February 13, 1877; application filed May 11, 1876.

To all whom it may concern:

Be it known that we, NOAH SHAW and DONALD KENNEDY, of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Machines for Making Laths, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of our improved combined machine for sawing lath-bolts and laths. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation and partial section of the same. Fig. 4 is a detail view, showing the construction of the frame at the end where the lath-bolts are sawed. Fig. 5 is a detail view of the saw-shaft, with saws, pulley, intermediate tooth-gear, and end bearing of said shaft. Fig. 6 is a detail sectional view for showing specially the swinging finger-bar and fingers in front of the lath-bolt saws. Fig. 7 is a detail sectional view of the parts by which motion is transmitted to the feed-rollers of the bolt-saws. Fig. 8 is a sectional view of the oscillating journal-bearing used for the adjustment of the portion of the feed-gear shown in Fig. 7. Fig. 9 is a detail sectional view of the fulcrum journal-bearing of the shaft of the feed-gear shown in Fig. 7. Fig. 10 is a detail sectional view of the balanced differential gages used in sawing the laths from the lath-bolts. Fig. 11 is a detail sectional view of the same when in action. Fig. 12 is a central longitudinal section of the self-adjusting pressure-rollers used behind the bolt-saws. Fig. 13 is a longitudinal section, in the line *x x* of Fig. 1, of a part of the lath-table, and the finger-board used in front of the lath-saws. Fig. 14 is a detail view, illustrating the manner of fastening a removable end bearing of the shaft of the bolt-saws to the frame.

The nature of our invention consists in certain constructions, combinations, and arrangements of parts, as hereinafter described and specifically claimed, whereby an improved combined machine for sawing lath-bolts and laths is produced.

The object of our invention is to make a machine of very simple construction, and at small expense, by which both the bolts for laths and the laths themselves are sawed mc rapidly and economically, and with less da ger to limb and life of the operator, than h hitherto been done by other machines, and the same time to have in such a machine ea access to the saws without removing the sa shaft, and still provide the heavy end of tl saw-shaft with a removable step or spind support or bearing; and another object is lessen the labor of handling the lumber sawing the bolts into laths, by providing a intermediate table or support therefor betwee the two gangs of saws.

To enable others skilled in the art to u derstand our invention we will proceed to d scribe it.

In the accompanying drawings, A repr sents the top frame of our combined lath-bo and lath-machine, supported by legs B. Th left end of the said frame is provided with semicircular arch, A^1, cast with the frame, t which another removable arch, A^2, is fastene A straight end-bearing bar, C, is horizontall inserted into the said arch A^1, and there s cured by tapered bolts *c*, fitted half into th bar C and half into the arch A^1, and held i place by nuts, as seen in Figs. 1 and 4. A other arch, A^4, with an immovable cross-ba C', is placed across the frame near the cente thereof, and directly opposite the arch A and bar C, and an upper removable arch, A is placed opposite the arch A^2, directly abov the said arch, near the center of the frame.

The intermediate cross-bar C' and a cross bar at the right-hand end of the frame A ar provided with journal-bearings, *a*, for the saw shaft D, which shaft has its driving-pulley D between the said bearings, and has one set o saws at each end outside of the said bearings At the left end of the saw-shaft, and betwee the arches A^2 and A^3, a gang of large saws E, for sawing the lath-bolts, is attached, in th usual mode, by means of a rigid collar, *d*, loos collars or washers d^1, and a nut, d^2. Th shaft D extends beyond the nut d^2 in the shap of a spindle-foot, D^2, for which a step or bear ing; c', is provided in the removable bar C, t support the shaft and insure a quiet an smooth motion of the saws. The said step c is lined with composition or other shaft metal to avoid wear of the shaft end. The arches

A^2 form a circle of larger diameter than the s E, and concentric with the same, that saws may be passed through them in pass- them off and on the saw-shaft D. The l-gear of the said saws consists of a front rear roller, F, between the saws and the l and discharging boards a^1 and a^2 of the -table. These rollers have roughened sur- s, and are driven by gear-wheels F′, from ntral transfer gear-wheel, *e*, on a stud, *e′*, he bar C. The said wheels F′ and *e* are ured by screws *f* with crank-heads, which fastened or loosened by hand, thus making use of a screw-wrench unnecessary. The el *e* receives motion from a pinion, *g*, Fig. n a shaft, G, which has its bearings in lower arches A^1 A^4 of the main frame, is, at its left-hand end, provided with a ley, *g′*. The pulley *g′* is moved by the fric- n-pulley *h* on the shaft H. The left end of shaft H is supported by a bearing, I, Fig. which is provided with a fulcrum, *i*, in the ss-bar B′ of the frame, and a notch, i^1, at opposite side, into which the head *j* of the ing-lever J fits. The long end of the lever is provided with a perforated head, *j′*, ough which the end of a rod, K, is passed, l there secured by a nut, *k*. The upper part the rod K is provided with a screw, k^1, and and-wheel, k^2. The screw k^1 passes through head *l* of a bracket, L, which is fastened to frame A. By turning the hand-wheel k^2 rod K moves up or down, thereby raising lowering the lifting-lever J, and moving the ction-pulley *h* from or to the pulley *g′*. This vement is permitted by the right end of the aft H being supported by a bearing, I′, con- ting of two halves, the lower one of which s at each end a lug, i^2, into which the point a set-screw, i^3, is fitted. The said screws e seated opposite each other, in upright pro- tions *b′* of the transverse bar B^2, and form horizontal pivot for the bearing I′. The lley *h′* drives the pulley *m* on the feed-shaft by means of a belt. The shaft H has a iving-pulley, H′, on its free end, whereby it ceives motion through a belt from the line- afts of the building.

The rear discharging feed-roller F (shown Fig. 1) is provided with a compound press- e-roller, N, consisting of as many loose llers N′ as there are spaces between the ws E, and arranged in line with them, so at each roller N′ bears on a bolt cut by the id saws, and adapts itself to its height, hich often differs according to the form of e slab from which the bolts are cut. The llers N′ are supported by a shaft, *n*, and be- veen two rigid shoulders *n′* on the said shaft, s shown in Fig. 12. The shaft *n* is, at both ds, supported by the heads *o* on the lever- ms *o′*, which are fastened to the rock-shaft O. he shaft O is supported by the arches A^2 ^{3}, and is provided with a hand-lever, O′, for e operator. The axial holes of the rollers ′ are very large, so as to allow considerable lay on the shaft *n*, as illustrated plainly in Fig. 12, where a slab is represented as cut into bolts *b*, and passing under them. The pressure-roller N, made up of sections N′, as described, is well adapted for the special use shown; but it is evident that it will be found useful and important in other machines for working upon lumber. Between the front feed-roller F and the saws E a finger board, P, consisting of parallel fingers *p*, arranged and fastened to a shaft, P′, is interposed, the said fingers *p* forming the continuation of the feed-table a^1 to near the saw-shaft, for the purpose of supporting the bolts between the saws. The said fingers *p* are provided with strengthening-ribs *p′*, as shown in Fig. 6, which, when in their normal position, rest upon a cross-piece, a^3, fastened between the lower arches. When the saws are to be re- moved, the finger-board P is swung up on its bearings in the frame A, as shown by dotted lines in Fig. 6, and the saws may be taken off their shaft D. The shaft M extends beyond the frame A, and is provided with a feed- roller, M^2, and a gear-wheel, m^1. A wheel, m^2, which is driven by the wheel m^1, has a pulley, m^3, and a pressure-roller, M^3, upon its shaft, which revolves in a vertically-movable bear- ing, Q. The bearing Q is loosely fitted on two upright screw-bolts, *q*, which are fastened to the feed-table R of the lath-saws *r*, on the right end of the saw-shaft D. Between the nuts q^1 of the said screw-bolts and the tops of the bearing Q spiral or india-rubber springs q^2 are interposed, whereby the said bearing, and with it the pressure-roller, is made to bear upon the lath-bolts below it. In rear of the lath-saws, and above the table R, a sim- ilar pressure-roller and bearing, Q, is provided, and beneath this roller, through an aperture in the table, a smooth-surfaced roller, m^4, is provided. The pulley m^3 and roller m^4 are connected by a belt, whereby the rear press- ure-roller receives its motion from the front pressure-roller. The smooth, loose roller M^4, below the rear pressure or feed roller M^2, pre- vents friction of the laths against the table R. The table R is, at its rear end, hinged to the frame A by means of a stud, r^1, and near the front end it is supported by a set-screw, r^2, in the frame A, by which it may be adjusted higher or lower, as desired. S, in Fig. 13, represents a finger-board with parallel fingers *s*, passing between the saws *r*, to support the laths. This finger-board has a step, s^1, where- with it is inserted into the table R, and fast- ened below with screws s^2. The forward end of the said finger-board is extended laterally on each side of the fingers to give more firm- ness to the same. One of the extensions, s^3, may be seen in Fig. 13. A stationary gage, R′, on the table R serves for a lateral bearing of the bolts under ordinary circumstances; but when the bolts are of trapezoidal sec- tional shape, the bolts must, in order to cut as many full-breadth laths as possible, some- times be moved a fraction more or less than a lath's thickness from the gage R^1, for

which purpose the movable differential gages t are employed. The said gages t are pivoted to a stand, T, on the rear part of the table R, and pass in the shape of an arch, t^1, over the front pressure or feed roller M^2.

Near the front of the table R the said gages are slanted off toward the top, as seen at t^2, in Fig. 11, so that in pushing a bolt against such slant the gage is lifted without the aid of human hands. To prevent the said gages from bearing down upon the bolt and turning it off its course by means of an occasional irregularity of its edge, the gages t are balanced by springs u, which are fastened to a rigid arm, U, on the table R, and with their free ends engage with lips t^3 upon the high parts of the gages. Lateral deflection of the said gages is prevented on one side by the stationary gage R′, and on the other side by a doubly-bent guide-stand, V, fastened to the front part of the table R. The fact of having the whole feed-motion for the lath-saws fastened to the swinging table R, and of obtaining motive power for it by means of the gear-wheels m^1 m^2, enables the operator to gain quick and unlimited access to the saws r, and to just as quickly put it into operation, this being accomplished by swinging the table R up or down on the bolts r'. W is an elevated table between the two gangs of saws, and above the pulley D′, for the support of the bolts as fast as sawed. The frame A is provided with standards w^8, upon which the table W is mounted, and by which it is elevated above the plane of the bolt-saw and lath-saw tables, as shown.

Operation: After the speed of the feed-motion is decided upon, according to the character of the wood to be used for the laths, the hand-wheel k^2 is turned until the desired friction between the pulleys g' and h is produced. The slabs which are used for the manufacture of laths are, in quick succession, laid upon the feed board or table a^1, and pushed against the saws E, which cut them into bolts. The said bolts pass out at the rear, between the rear feed-roller F and the compound pressure-roller N. The rollers N′ bear upon the bolts, and press them against the feed-roller below, thereby preventing them from slipping. If, by chafing against the inclined parts of the slab, the said rollers should cause its direction to be changed, the operator lifts the rollers for a little while, by depressing the hand-lever O′, until he has righted the slab again. The bolts so cut are immediately sorted by an assistant stationed behind the machine, who throws the imperfect ones on a pile near the machine, and places the good bolts upon the table W. The operator of the lath-machine takes a bolt from the said table, and places it on the table R, hard against the gage R′. The end of the bolt is thereby placed under the slanted end of the right gage t, which, when the bolt is pushed toward the saws r, is lifted, permitting the bolt to pass under. The middle and the left gages are next lifted in succession, and the bolt passes them toward the saws r, where it is cut into laths, which are finally moved away from the saws by the pressure and discharging roller M^3 at the rear. If, by an irregular form of the edges of the bolt, a certain thickness of the same must go to waste, one or more of the gages t are lowered to present the bolt in such manner to the saws r that they may cut the highest possible number of good laths from the bolt.

The cheapness of the laths and the high price of machinery and labor make it very desirable to observe the greatest economy in regard to time and labor, and to have, at the same time, a machine which works very rapidly and accurately without being of delicate construction, and without causing the slightest apprehension of danger for the operators.

Our machine, by means of the finger-board, prevents the drawing down of slabs or bolts by the saws, and by means of the compound roller N it prevents the saws from lifting the bolts and throwing them forward. The saws E may be in a very short time removed and replaced by detaching the wheels e F^1 and the bar C, without removing the shaft D. The saws E, being heavy and seldom well-balanced, would require a very strong and heavy shaft to support them, if that part of the shaft to which they are attached was not supported. But by the step-bearing, as in our machine, at this end of the shaft, we are enabled to use a very light shaft, having less journal-friction, greater strength, and no wabbling motion. The feed-motion, which heretofore could either be not at all or very imperfectly regulated, is now changed by a very slight movement of the hand-wheel k^2, and without interruption to the work of feeding the slabs to the machine. The table W, which is a very necessary cover for the pulleys and belts below, forms also a very valuable means for placing the bolts in the most convenient manner within the reach of the operator of the lath-machine. The arrangement of a stationary and several movable gages on the table R of the lath-machine affords very valuable means for saving material in a very short time and without physical exertion. Experience in operating our machine has proved that laths can be made three times as fast as with machines of an old construction.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a combined lath-bolting and lath-cutting machine, having three tables, the single frame A, constructed with standards w^8, for supporting the middle table at an elevation above the end tables, substantially as herein set forth.

2. The combination, with the bolt and lath cutting mechanisms and rotary continuous feed-motion, of the swinging friction-pulley shaft, its swinging bearings, and the adjusting lever and screw, substantially as and for the purpose set forth.

3. In a combined bolt and lath cutting machine, the frame A and the removable bearing-bar or bridge-piece C, having a step, c', for the end bearing or spindle-foot D^2 of the saw-shaft, and a stud-bearing, e^1, for the intermediate wheel e of the feed-gear, substantially as and for the purpose set forth.

4. The arch A^1 of the main frame, having halved bearings for the conical bolts c, and the bridge-piece C, having halved bearings for the said bolts to match the said bearings of the arch A^1, the bolts c being provided at their small ends with nuts, substantially as and for the purpose set forth.

5. The swinging finger-board P and its fingers p, constructed and operating substantially as set forth.

6. The swinging table R, having the pressure-rollers of the feed-motion, the gages, and the finger-board attached to the said table, substantially as and for the purpose set forth.

7. The vertically-movable bearing Q for the pressure-rollers, constructed with two guide-passages for the guide-bolts, and operating as set forth.

8. The balanced differential gages t, pivoted above the table, and constructed and operating as hereinbefore set forth.

9. The stepped finger-board S, having its extensions s^3 and fastening-screws s^2 below the table R, substantially as set forth.

10. The set-screw r^2, in combination with the hinged table R, and pressure-roller and front feed-roller, substantially as set forth.

11. The frame A, having the bottom bearings of the feed-rollers F formed on it, in combination with the upper removable arches A^2 A^3, having the top bearings of the said feed-rollers formed on them, substantially as hereinbefore set forth.

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