

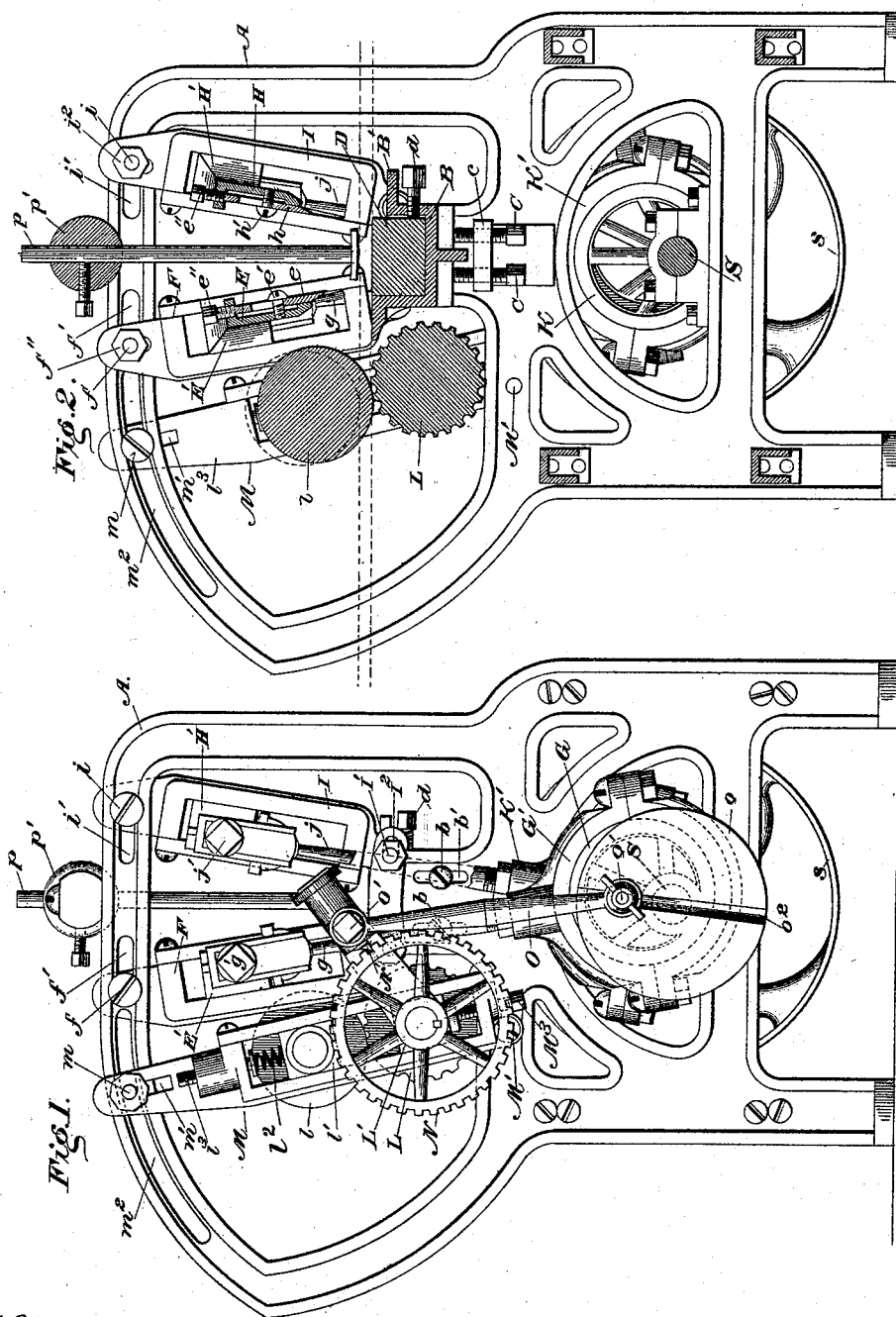
(No Model.)

3 Sheets—Sheet 1.

I. A. KERR.
STAVE JOINTING MACHINE.

No. 524,982.

Patented Aug. 21, 1894.



Witnesses:
M. S. Fowler
James Mansfield
Inventor:
Isaac A. Kerr
By his Attorneys, *Alexander & Dowell*

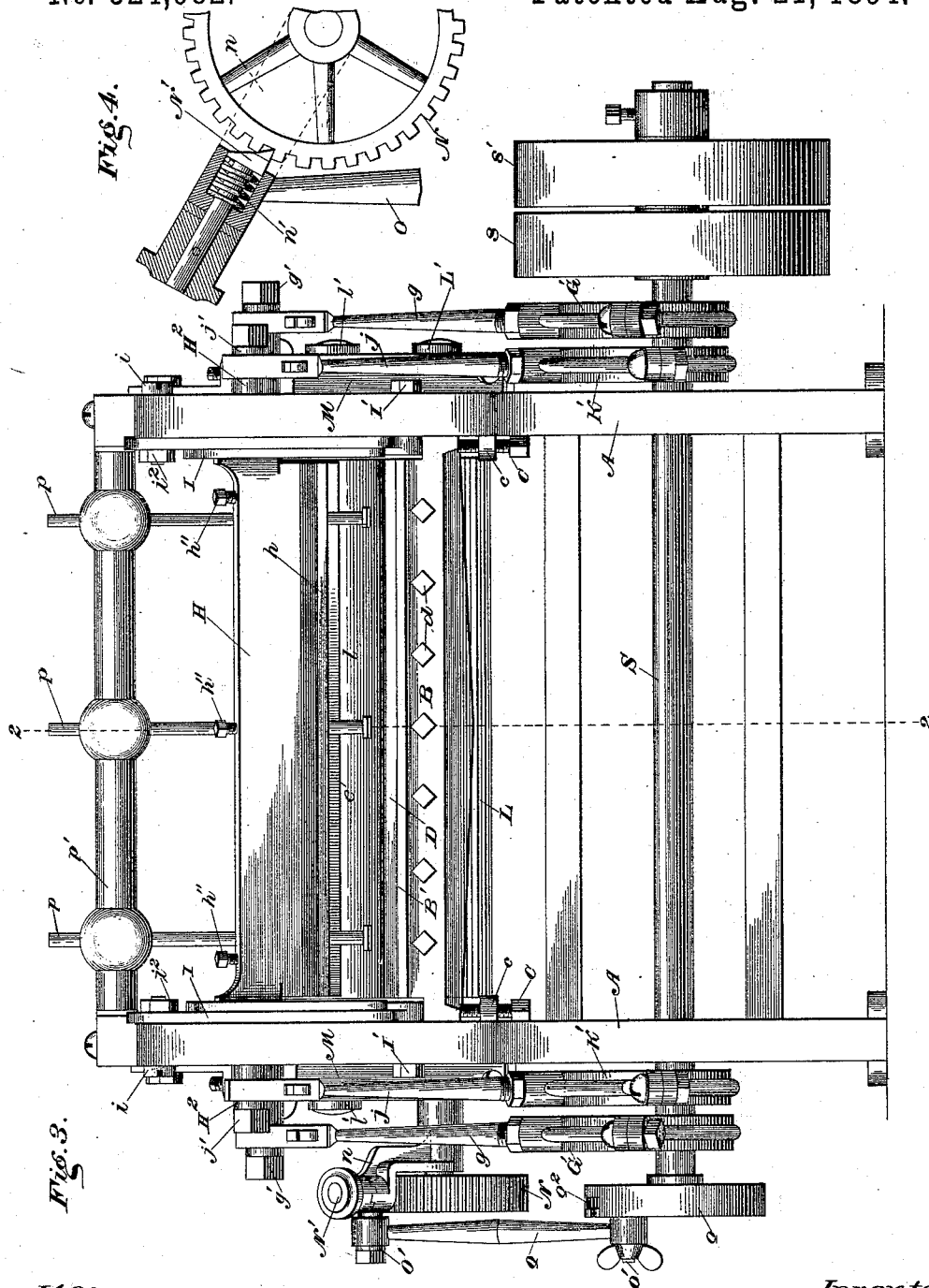
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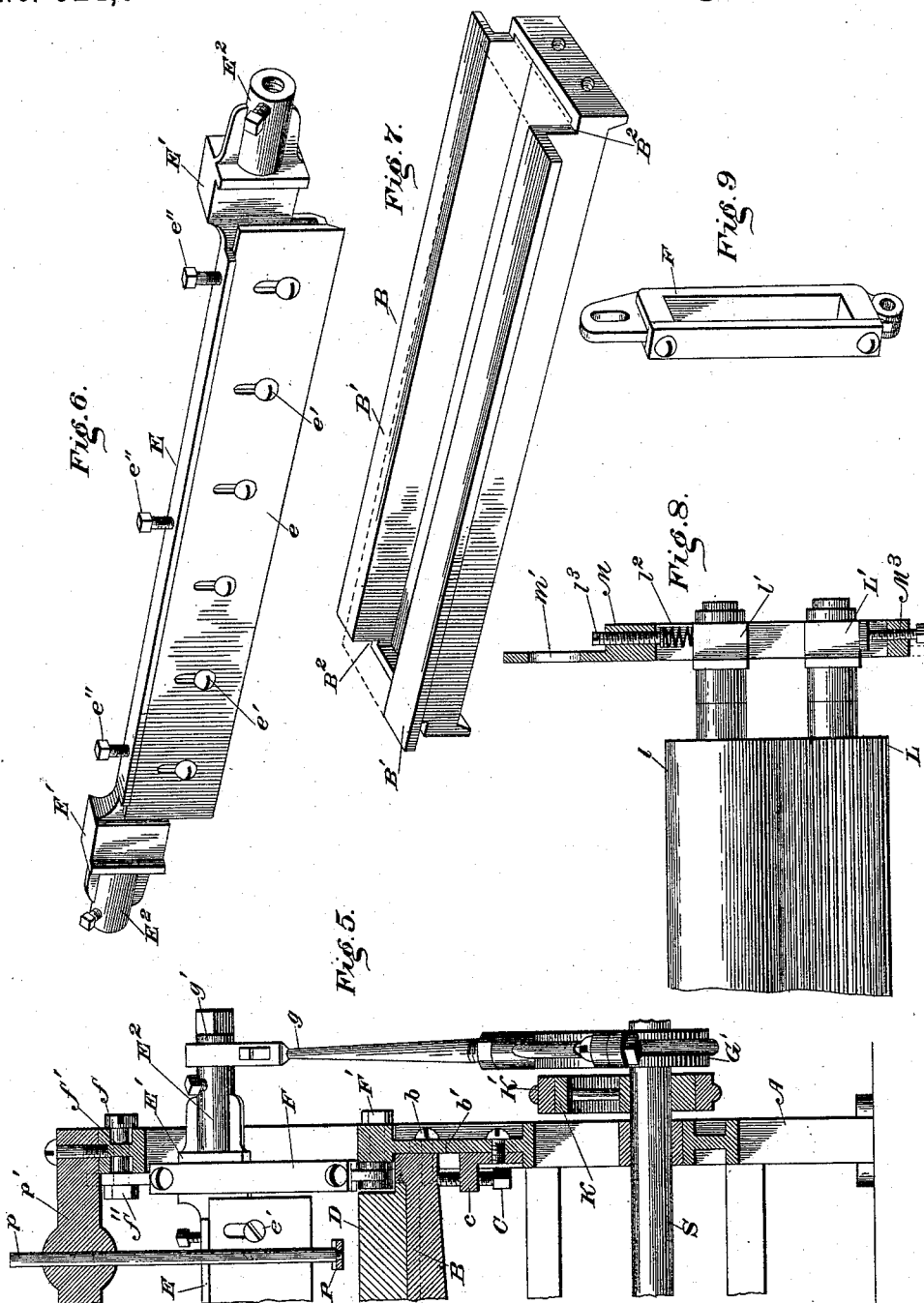
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UNITED STATES PATENT OFFICE.

ISAAC A. KERR, OF MUSCATINE, IOWA.

STAVE-JOINTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 524,982, dated August 21, 1894.

Application filed May 6, 1893. Serial No. 473,232. (No model.)

To all whom it may concern:

Be it known that I, ISAAC A. KERR, of Muscatine, in the county of Muscatine and State of Iowa, have invented certain new and useful

5 Improvements in Stave-Jointing Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked
10 thereon, which form part of this specification.

This invention is an improved machine for jointing staves for barrels, boxes and other "bulged" or plain cylindrical vessels, also adapted for cutting straight sided slats for
15 boxes, &c., and it consists in the novel construction and combination of parts hereinafter described in detail and illustrated in the accompanying drawings, in which—

Figure 1 is a right hand end view of the
20 machine. Fig. 2 is a transverse vertical sectional view of the machine on line 2—2 Fig. 3. Fig. 3 is a rear elevation. Fig. 4 is a detail of the ratchet devices for actuating the feed roll. Fig. 5 is a vertical sectional view
25 through one end of the machine in the line of the main shaft. Fig. 6 is a detail perspective view of one of the knife bars. Fig. 7 is a similar view of the bed. Fig. 8 is a detail sectional view through the feed roll carrying frame. Fig. 9 is a detail view of one of the
30 swinging frames F.

Referring to the drawings by letters, A, A, designate the end pieces of the frame, preferably made of metal and rigidly connected
35 by horizontal side bars or in other suitable manner.

B designates a bed which is much narrower than the frame and is mounted therein, its ends being supported on vertically adjustable
40 bolts C tapped through brackets c on the inner faces, and about center, of the end pieces A, as shown. The bed is kept from lateral movement by means of bolts b tapped into its ends, and playing through short vertical
45 slots b' in the end pieces A above the brackets c as shown. The vertical adjustment of the bed is thus provided for. On the upper side of the bed are placed cutting blocks D of wood, or other suitable material against which the
50 cutting blades of the machine act, said blocks being removably secured in position by means of bolts d tapped through the rear one of the

side flanges B' on the bed, the flanges preferably being turned outward at top so as to protect the bolts, and to increase the width
55 of the beds.

The bed is preferably made of cast metal and very stiff so that it will not yield when the staves are being cut thereon.

E, and H, are the front and rear knife bars, 60 arranged parallel with and at opposite sides of the bed, as shown.

Bar E has guide blocks E' on its ends that are mounted in ways formed in guide frames F which are pivotally secured by bolts F' to 65 the end pieces A; bolts F' lie opposite the ends of the bed and below the top surface of the latter, flanges B' being cut away as at B² to accommodate the lower ends of the guide frames, so that they can be adjusted to a ver-
70 tical position and the knife bar E overlies the bed.

The upper ends of guide frames F are adjustably secured to the tops of pieces A, by means of bolts f, which pass through short
75 slots f' in the upper part of end pieces A, and through openings in the tops of the guide frames, and are secured by nuts f''; by this means the guide frames F can be adjusted so that the knife bar will be reciprocated in a
80 vertical plane toward and from the bed, or in a plane slightly inclined thereto. Guide frames F lie at the inner sides of pieces A, and blocks E are provided with outwardly
extending portions E² in which are secured
85 wrist pins g' to which are connected the upper ends of pitmen g the lower ends of which are connected to eccentric straps G' embracing eccentrics G fixed on the outer ends of
90 the main shaft S, which lies parallel with and below the bed which is journaled in suitable bearings in or on pieces A so that when said
shaft is rotated, the knife bar E will be reciprocated toward and from the bed as will be
evident from the drawings. 95

Knife bar H lies opposite bar E at the rear side of the bed and is provided with blocks H' on its ends, mounted in guide frames I, similar in construction to guide frames F, but facing oppositely thereto. The lower ends of 100 guide frames I are pivoted on bolts I' which are adjustably secured in short substantially horizontal slots I² in the end frames A, opposite the ends of bed B as shown, so that the

lower ends of guide frames I can be adjusted toward or from the frames E, and thus different widths of staves can be cut by the same machine.

- 5 The upper ends of guide frames I are adjustably connected to the frames by bolts i which pass through short slots i' in the upper portion of end pieces A, and are secured by nuts i^2 as shown. By this means the guide
10 frames I can be adjusted so that knife bar H will be reciprocated in a vertical plane toward and from the bed, or in a plane slightly inclined thereto. Guide frames I lie at the inner sides of pieces A, and blocks H' are
15 provided with outwardly extending portions H² in which are secured wrist pins j' to which are connected the upper ends of pitmen j , the lower ends of which are connected to eccentric straps K' embracing eccentrics K fixed on
20 the shaft S beside eccentrics G, and preferably turned a little in advance of the latter so that the knife bars will not move exactly together, but one knife will be caused to cut somewhat in advance of the other.
- 25 e , and h , designate the knives, of any suitable construction adjustably secured to the opposed faces of bars E and H by screws or bolts e' and h' respectively, passing through transverse slots on the blades, and adjusting
30 bolts e'' h'' are tapped through the knife bars above the blades to compensate for wear thereof.

- The stock to be operated upon is fed between the knife bars and bed by means of
35 rolls L, and l , which are journaled in boxes L' l' respectively, said boxes being mounted in guide slots in guide frames M which guide frames are pivoted at their lower ends on bolts M' attached to the end pieces A below
40 and in front of the bed and on the outer faces of pieces A. In the upper ends of guide frames M are short slots m' through which pass bolts m that also engage slots m^2 in the pieces A, said slots m^2 being made on arcs of
45 circles struck from bolts M' whereby guide frames M can be secured in a vertical position, so that the rolls will properly feed the stock, or can be swung outward so as to draw the roll away from the bed out of the way.
50 and ready access can be had to the knife bar E and bed without removing the feed rolls from the machine, or altering their relative adjustment.

- Roll L is preferably grooved or roughened
55 and is the positively driven roll; it can be vertically adjusted in guide frames M by means of bolts M³ tapped through the lower ends of the frames and impinging against boxes L' as shown. The roll l is pressed toward roll L by means of springs 12 interposed
60 between its boxes l' and the upper ends of the guide slots. The tension of said springs can be regulated by bolts 13 tapped through the upper end wall of the guide slot as shown.

- 65 The shaft of roll L is extended at one end beyond the guide frame, and upon its extremity is secured a notched pinion N. This

pinion is engaged by a spring-controlled tooth N' which is secured in a socket n' on the outer end of a rocking arm n which is journaled on the roll shaft intermediate the pinion N and box L'. The arm is vibrated or
70 rocked, by means of a pitman O which is attached at one end to a wrist pin O' on the outer end of the arm and at its lower end to
75 a wrist pin o' which is adjustably secured in a transverse groove o^2 in a disk o fixed on one end of shaft S, exterior to the eccentrics. By adjusting the wrist pin o' on the disk the amount of vibration of arm n is controlled, 80
and consequently the amount and time of revolution of roll L. The tooth N' is so adjusted that it only engages the notches in pinion N when the arm moves in one direction, and rides thereover when the motion of
85 the arm is reversed. Driving and idler pulleys s , s' may be mounted on the other end of shaft S.

The machine is designed to operate on veneer, or other suitable stuffs, and the parts
90 are so adjusted that rolls L, l , will be operated and feed in a proper length of stock while the knife bars ascend, or are sufficiently above the bed to not interfere with
95 the incoming stock. While being cut the stock is kept down on the bed by means of presser feet P on the lower ends of rods p , which are adjustably secured to a transverse bar p' overlying the bed and mounted on the
100 main frame as shown.

In making straight slats, guide frames F and I are adjusted to a vertical position, so that knife bars E and H will be reciprocated in planes perpendicular to the bed. When
105 making staves for barrels or other circular articles the guide frames F and I are adjusted so that they move in planes inclined to the bed, and divergent from each other more or less according to the size of the vessel; they will then make bevel or incline cuts
110 on the edges of the staves so that closely fitting joints will be made between the staves when assembled and bound together. When making "bulged" barrels or other vessels the
115 knives e , h , are sprung laterally, so that their ends will be nearer together than their centers, and consequently the staves produced will be wider at center than at their ends.

By adjusting the lower ends of guide frames nearer together, or farther apart, the
120 staves, of any desired width, within certain limits, can be produced. By setting the knife bars nearer together at one end only, tapered staves or slats can be made. When cutting
125 straight slats with straight edges, one knife can be thrown out of action, or removed, and the width of slats produced regulated by adjusting the throw of pitman O.

By this machine the staves can be jointed and cut at the same operation and one will
130 be made for each revolution of shaft S, the feed and cutting being entirely automatic the work can be done with rapidity and with perfect accuracy.

In large machines it may be found desirable to make the pitmen which operate the knife bars in longitudinally adjustable sections to allow free adjustment of the knife bar guide frames and the proper reciprocating movements thereof, without binding; but the bed can be vertically adjusted so as to compensate for any slight variation in the throw of the knife bars caused by the swinging of the guide frames.

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

1. In a stave jointing machine the combination of a stationary bed, with an adjustable swinging guide frame at each end thereof, a reciprocating knife bar mounted in said frames, and adjustable therewith whereby it can be caused to operate in planes either perpendicular or inclined to said bed; and a pair of feed rolls mounted in swinging guide frames at one side of and adjustable toward or from the bed, substantially as and for the purpose set forth.

2. The combination with the horizontal bed, of a pair of opposite but substantially vertically reciprocating knife bars, and independently adjustable swinging guides for said knife bars whereby they can be caused to operate in planes perpendicular, or inclined to the bed, and a pair of feed rolls mounted in swinging supports adjustable toward or from the bed, all constructed and arranged to operate substantially as and for the purpose set forth.

3. In a stave jointing machine the combination of the main frame, the horizontal bed mounted therein, a vertically reciprocating knife-carrying bar parallel with the bed, independent laterally swinging guide frames for said knife-bar pivoted to the main frame at each end of the bed, the main shaft below the bed, and eccentrics and pitmen for reciprocating said bar, and the presser bar, and feed rolls mounted in independent laterally adjustable frames beside the bed, substantially as specified.

4. The combination of the main frame the horizontal bed thereon, the pairs of swinging guide frames F and I pivoted at their lower ends to the end pieces of the frame on opposite sides of the bed, and the bolts in the upper ends of said frame engaging slots f' i' respectively in the end pieces of the main frame the reciprocating knife bars E and H, the knives thereon; and main shaft, eccentrics G, K, and connections for operating said knife bars from said eccentrics, all constructed substantially as and for the purpose described.

5. The combination of the main frame having slotted end pieces the vertically adjustable bed B, the swinging frames F, I, pivoted to said end pieces beside the bed and the bolts f , i , in the upper ends of said frames engaging slots f' i' , in said end pieces, the reciprocating bars E, H, mounted in said frames, and the knives carried by said bars; with the main shaft S, the pairs of eccentrics G and K on each end thereof, and the eccentric straps G' K' and pitmen g , j , connecting said straps to the bars E, H, all constructed and arranged substantially as described.

6. The combination with a vertically adjustable bed, a pair of reciprocating knife bars, laterally swinging guide frames for said bar independently adjustable toward or from each other, and mechanism for reciprocating said bars, and feed rolls mounted in laterally swinging frames and adjustable toward or from the bed, and means for securing said frames when adjusted, substantially as and for the purpose specified.

7. The combination with the vertically adjustable bed, the reciprocating knife bars at opposite sides thereof, knives on said bars laterally swinging guides for said knife bars, a main shaft, eccentrics thereon, and pitman connections between said eccentrics and knife bars for operating the latter, the feed rolls mounted in a laterally swinging frame, a ratchet pinion on one roll, and a pitman and crank disk for operating said roll from the main shaft, substantially as specified.

8. In a stave jointing machine the combination of a horizontal adjustable bed, laterally swinging guide frames at each side thereof, knife bars mounted in said guide frames, a pair of laterally swinging frames pivoted below and to one side of said bed, and feed rollers mounted in said frames; with the main shaft below the bed, a pair of eccentrics thereon at each end of the machine, and eccentric straps and pitman for operating said knife bars from said eccentrics; a slotted disk on one end of said main shaft, a ratchet pinion on one feed roll shaft, a swinging arm carrying a dog engaging said pinion, and a pitman connection between said arm and disk, all constructed and arranged to operate substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ISAAC A. KERR.

Witnesses:

CHARLES A. MULL,
JOHN MARKMENON.