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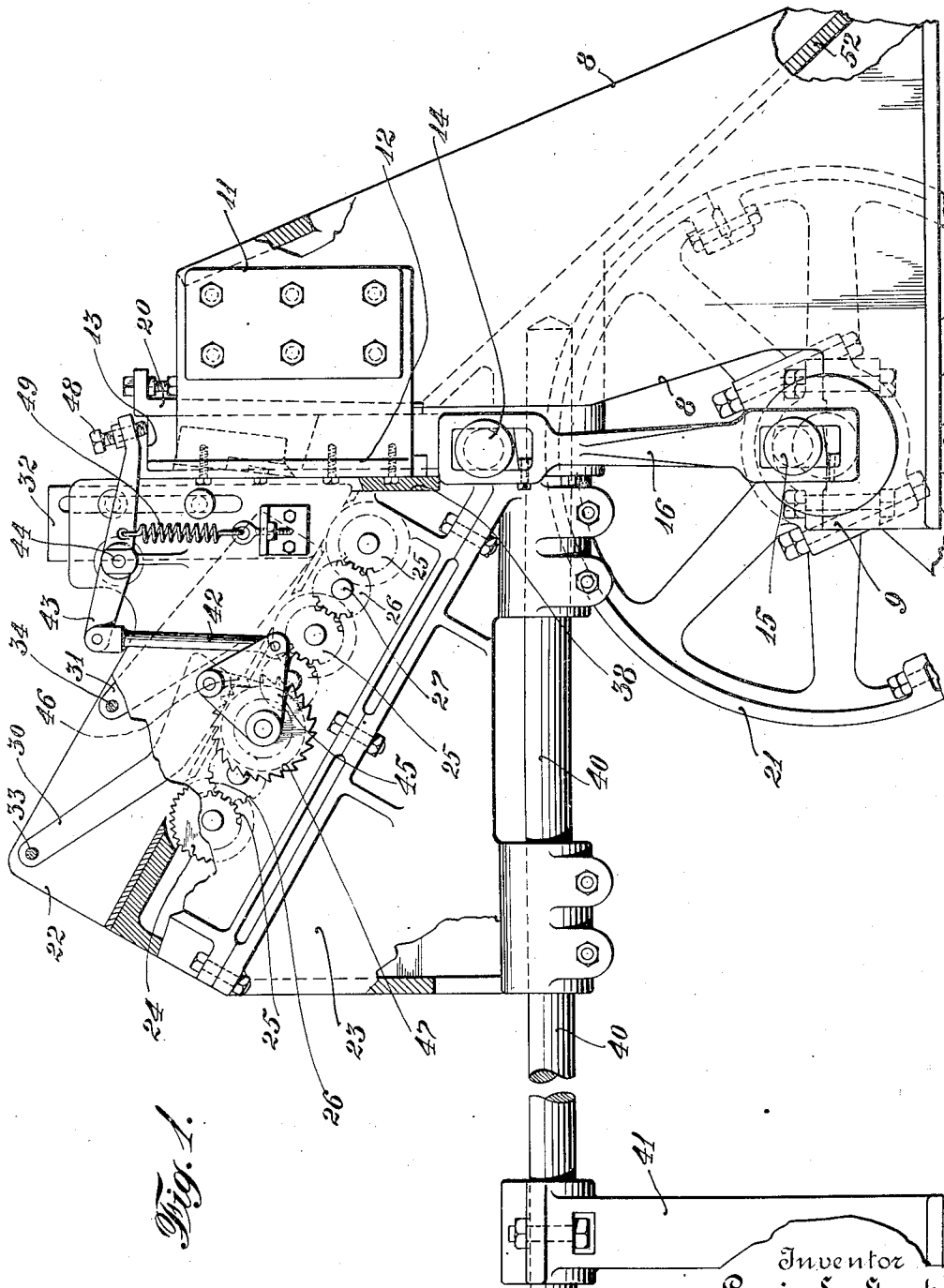
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L. H. STREET

PULPWOOD CHIPPING MACHINE

Filed April 8, 1921

5 Sheets-Sheet 1



Inventor
Louis So. Street

By his Attorney

By his Attorney
Edward Wright

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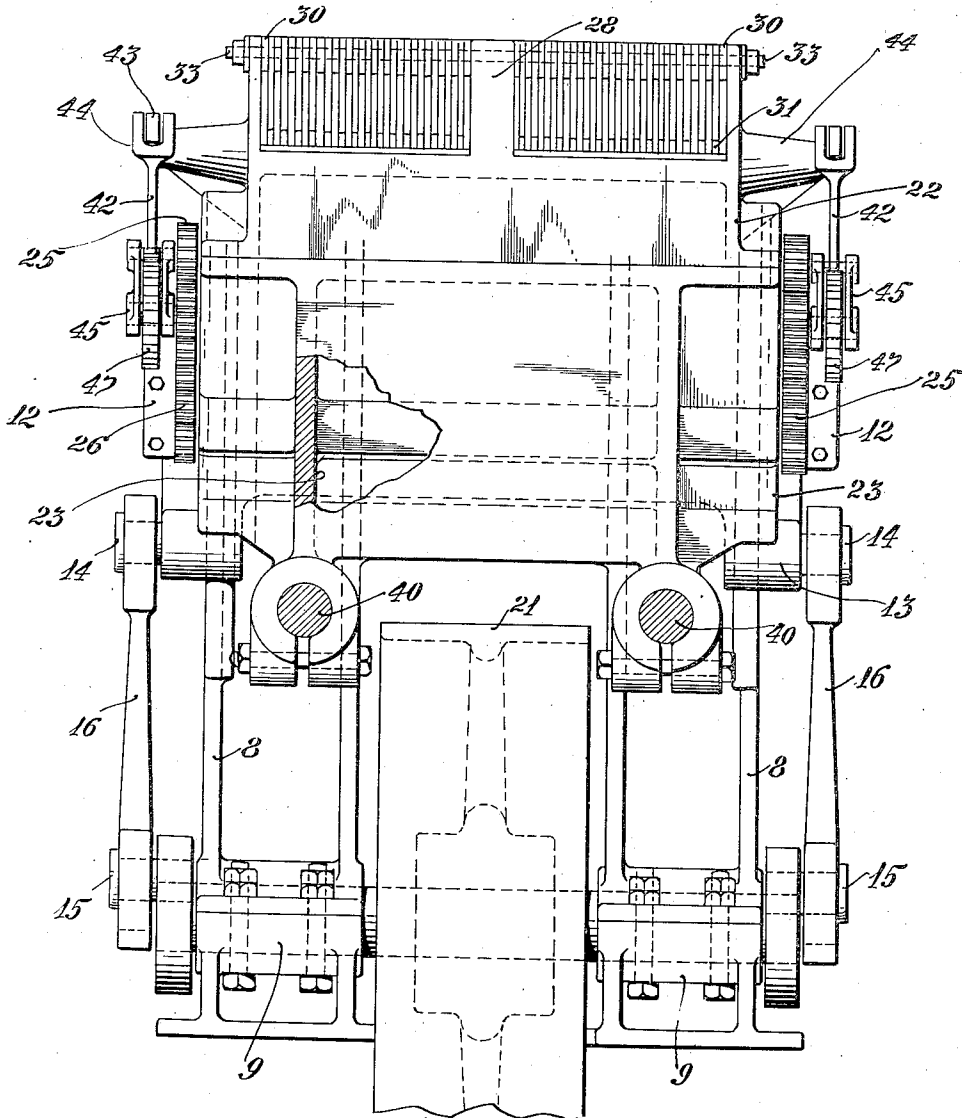
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Fig. 2.



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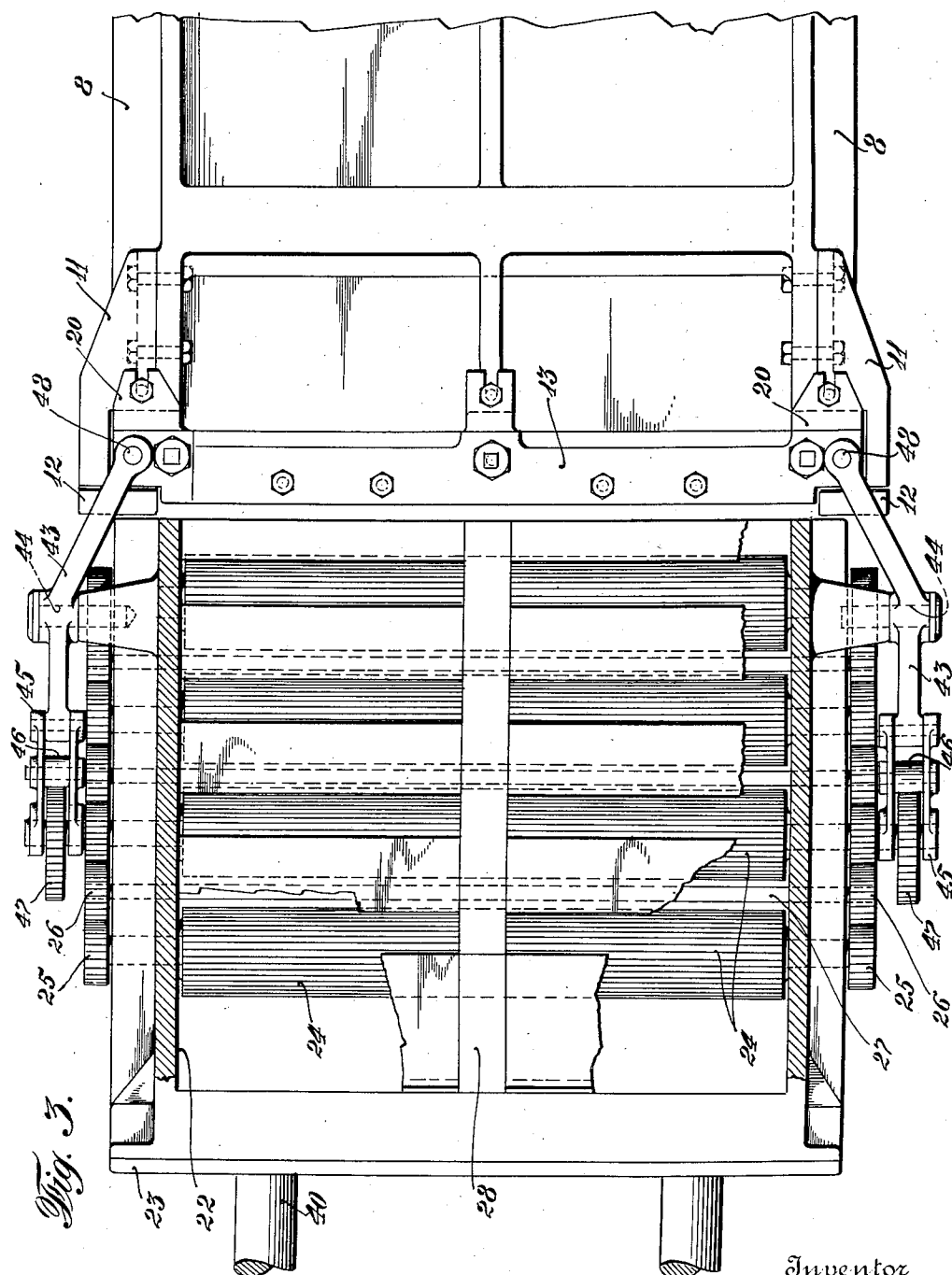
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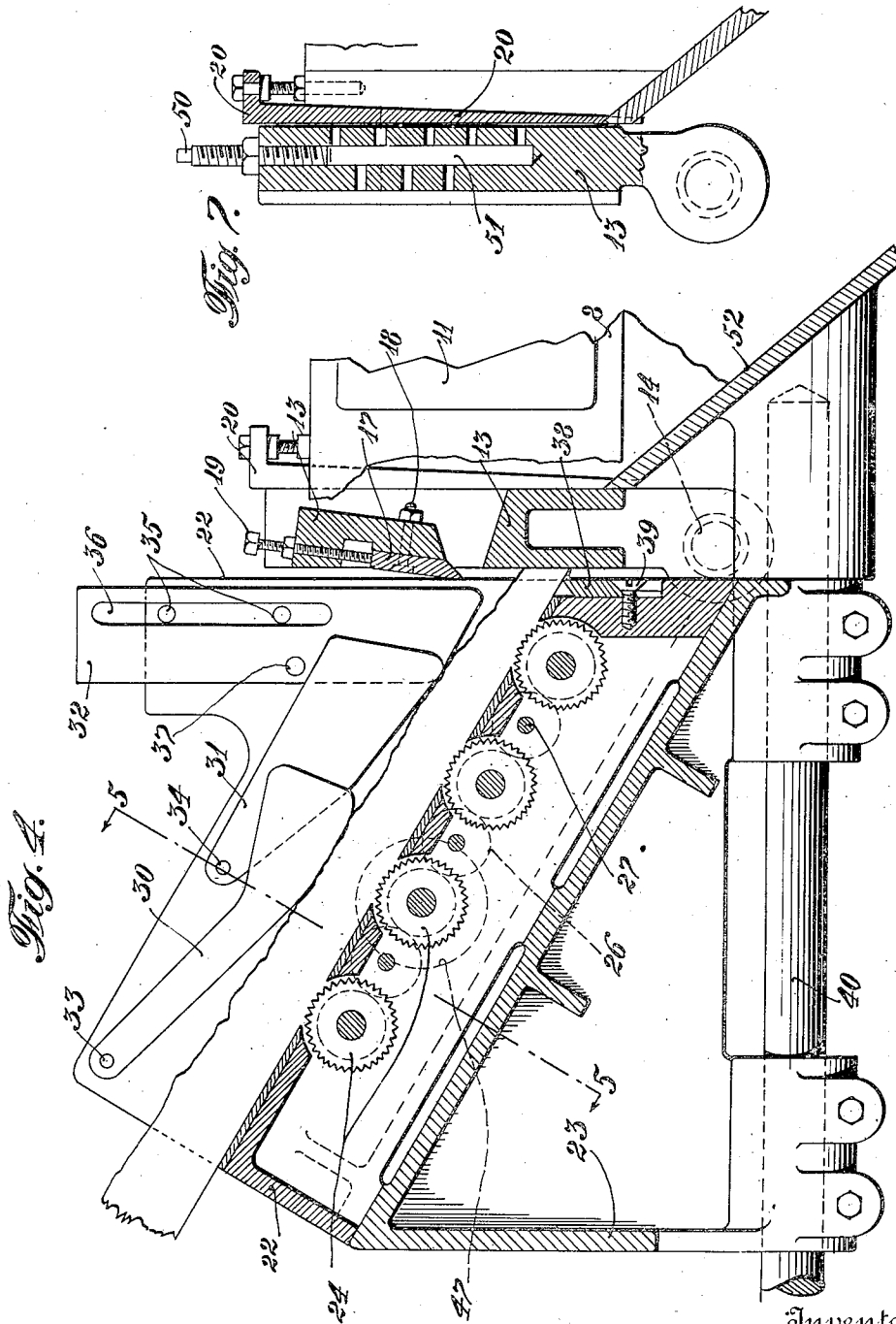
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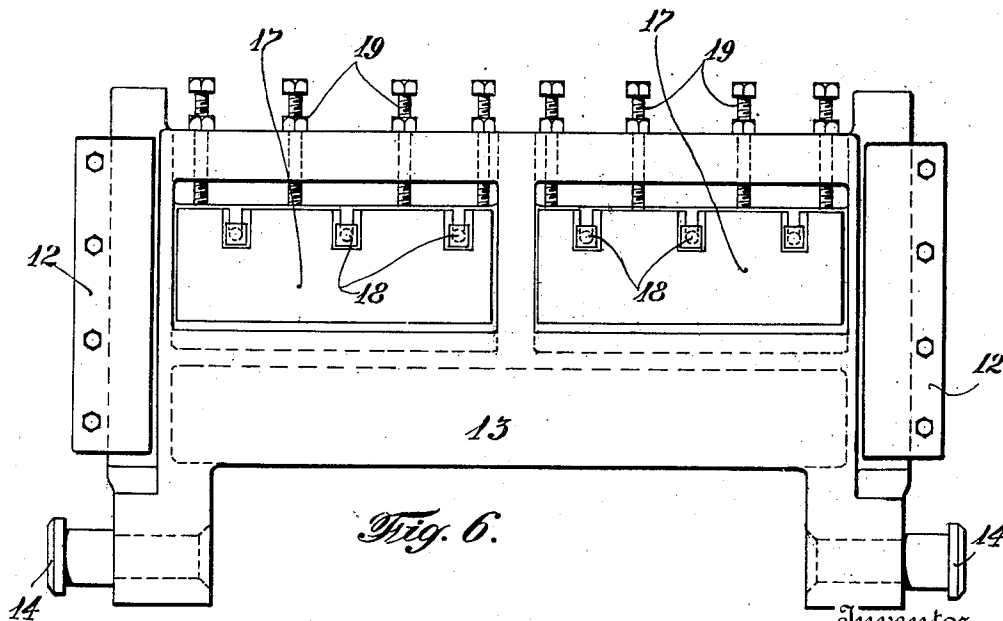
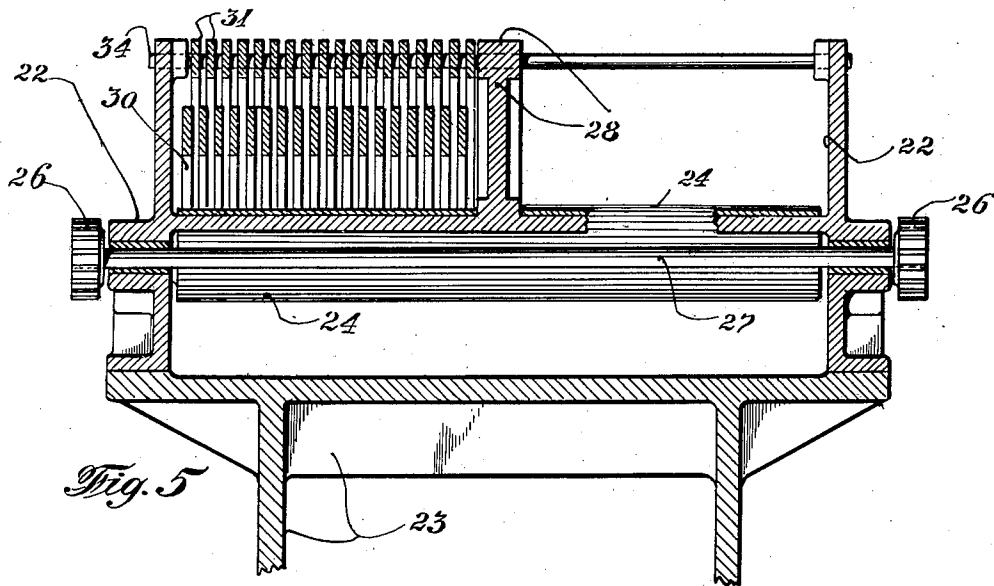
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UNITED STATES PATENT OFFICE.

LOUIS H. STREET, OF OLEAN, NEW YORK.

PULPWOOD-CHIPPING MACHINE.

Application filed April 8, 1921. Serial No. 459,768.

To all whom it may concern:

Be it known that I, LOUIS H. STREET, a citizen of the United States, and a resident of Olean, in the county of Cattaraugus and State of New York, have invented a certain new and useful Improvement in Pulpwood-Chipping Machines, of which improvement the following is a specification.

This invention relates to machines for chipping pulpwood, as used particularly in the manufacture of chemical pulp for paper.

With the type of chipper as heretofore commonly used, in which the slabs, edgings, or other pieces of wood are fed through a downwardly inclined spout or trough by gravity against a rotary disc or drum carrying the knives or cutters, difficulty has been experienced in obtaining uniform sized chips, particularly when cutting through the last few inches in length of the pieces the short ends are liable to turn broadside to the knife, thus producing a long slice or sliver instead of a chip, which necessitates rechipping and screening, with consequent loss in dust and waste pieces to small for chips.

The object of my invention is to provide a machine in which clean cut transverse chips of uniform size may be rapidly and efficiently produced throughout the entire length of the slabs or stock even up to substantially the last chip, whereby waste is eliminated, and the inconvenience, delay, and expense of rechipping and screening is avoided. With this object in view, one of the features of my invention comprises an improved cutting means having what may be termed a straight stroke knife adapted to reciprocate at the end of the feed trough or spout. Another feature comprises an improved feed spout and means for holding the stock in position during its passage therethrough. Another feature comprises improved automatic feeding mechanism for the stock. These and other features will more fully appear from the following detailed description of a machine embodying my improvement, and the novel features will be set forth in the appended claims.

In the accompanying drawings: Figure 1 is a side elevation of a straight stroke chipping machine embodying my improvement; Fig. 2, an end elevation; Fig. 3, a plan, with the press plates removed from the feed trough; Fig. 4, a vertical longitudinal section through the feed trough and cutter;

Fig. 5, a transverse section of the feed trough taken on the line 5—5 of Fig. 4; Fig. 6, an elevation of the cutting knives and carrier frame; and Fig. 7, a transverse section of the knife frame and guides, showing adjustable wedge and lubricating means.

According to the construction shown, the machine comprises a main frame, 8, having bearings, 9, for the crank shaft, 10. The upright side web portions of the frame are fitted with side plates, 11, to which may be bolted the guide plates, 12, forming the fixed slide ways for the knife frame, 13, having pins, 14, coupled by the connecting rods, 16, with the crank pins, 15, of the shaft, 10. The main frame may be formed of cast iron with webs of suitable thickness but the main caps of the crank shaft bearings are preferably of cast steel, suitably lined with the best bearing metal as these bearings take the full cutting strain of the knife frame during the cutting stroke. The knife frame, 13, is preferably of cast steel and provided with one or more steel knife blades, 17, detachably mounted on bolts, 18, and held by adjustable bolts, 19. The slide ways for the knife frame are provided at the back side with adjustable brass wedges, 20, so that the great wear to which they are subjected may be readily taken up. The shaft may be operated from any suitable source of power, as for instance, a pulley, 21, which may be large and heavy to give a certain fly-wheel effect. As the crank shaft is rotated, the knife frame is reciprocated in the slideways by means of the connecting rods, thereby providing a straight stroke cutter.

According to another feature of my invention, I provide an improved spout or trough and mechanism for feeding the slabs, edgings, or other pieces of wood through the trough to the cutter. A preferred construction for this purpose comprises a trough casing, 22, which may be mounted on a triangular base portion, 23, so that the floor of the trough is inclined at a suitable angle, preferably about thirty degrees, to the horizontal, and having a plurality of horizontal feed rolls, 24, rotatably mounted beneath the trough floor and extending across the same from one side to the other. The rolls are provided with a fluted surface having saw toothed edges which extend slightly above the plane of the floor of the trough, and through openings therein, so as to engage the slabs or other stock for feed-

ing the same forward in the trough. The feed rolls are also fitted with steel spur gears, 25, meshing with intermediate pinions, 26, which may be carried on shafts, 27, also extending across the trough.

The trough is preferably made of cast iron, although the floor and walls may have removable steel linings, and a centre wall, 28, may be provided for dividing the trough into two sections.

For the purpose of holding the slabs or other stock down in contact with the fluted or saw-toothed surface of the feed rolls, I provide a series of press plates, preferably arranged vertically in sets or groups, such as 30, 31 and 32, and adapted to rest upon the stock. The plates, 30 and 31, are pivotally mounted on the respective rods, 33, and 34, extending across the trough and supported in the side walls, while the plates, 32, are guided on the pins or rods, 35, extending through the slots, 36, in the plates. The plates are preferably of steel, about one-half inch thick, the plates of adjoining sets overlapping and alternately arranged with respect to one another. The group of plates, 32, is mounted for vertical movement, at the inner end of the trough in close proximity to the face of the knife frame in such position as to bear upon the slabs or other stock when the same are reduced to the final short pieces which are held by these plates and pressed against the fluted surface of the final roll, 24, for insuring proper feeding of the short pieces during the last part of the movement. When the plates, 31 are bearing upon the stock, the plates, 32, may be held in a raised position by means of a pin, 37, carried by plates, 32, and riding upon the backs of the plates, 31. As the plates are free to swing or slide vertically and are independently adjustable, they readily conform to the irregular surface of the top or back of the slabs or other stock feeding through the trough, and hold the same firmly against the rolls.

The trough base may be supported in various ways, but, as shown, it is slidably mounted on the horizontal bars, 40, supported at one end on the main frame, 8, and at the outer end on suitable braces or posts, 41. By this means the trough may be slid up against the main frame when in operative position, and may be moved back or away from the frame a sufficient distance to permit easy access to the knives, and to adjust or change the reciprocating knives, 17, or the bed knife, 38, which is mounted on screws, 39, at the lower front edge of the trough and in a shearing plane with the vertically reciprocating knives when the trough is pushed up against the frame. The knife blades are slotted to receive the bolts or screws so as to be readily

adjustable or quickly removed and renewed when required.

In order to automatically feed the stock forward the desired distance for chipping after each cutting stroke of the knives, there is provided a lever arm, 43, pivoted at 44, upon the side of the trough and having a connecting rod, 42, attached to a pawl plate, 45, carrying a pawl, 46, for operating a ratchet wheel, 47, mounted on the shaft of one of the feed rolls, 24. The other end of the lever arm, 43, extends into the path of the vertically reciprocating knife frame, 13, and may be provided with an adjusting screw, 48, for engaging the same, so as to be struck by the knife frame upon each upward movement to shift the ratchet wheel and thereby turn all of the feed rolls through their gear connections. A spring, 49, may be employed to turn the lever arm in the opposite direction when the knife frame moves downward for the cutting stroke, and slide the pawl backward over the teeth of the ratchet wheel preparatory to the next forward stroke. The automatic feeding mechanism is preferably duplicated at the opposite side of the machine in order to increase the strength, durability, and accuracy of the same, but it will be evident that other forms of automatic feeding mechanism may be employed, if preferred. The length of chip may be readily varied as desired, by adjusting the screw, 48, and thereby changing the amount of movement, or length of travel, of the ratchet at each stroke of the machine. The reciprocating knife frame may be provided with grease plungers, 50, and perforations, 51, for lubricating the guides, as shown in Fig. 7.

The operation of the machine will now be apparent from the foregoing description. The stock, consisting of slabs, edgings, or other pieces of wood, is placed in the spout or trough, and is pressed against the sharp fluted rolls at the bottom of the trough by the multiple press plates resting on the top of the stock which then feeds forward at each stroke by the action of the ratchet. The main driving shaft operates to reciprocate the knife frame, 13, by means of the connecting rods, 16, and the knives may be driven at considerable speed, such as two hundred to three hundred strokes per minute. The stock is positively fed over the bed knife a distance equal to the length of chips desired at each up stroke, and at the straight down stroke, the knives make a clean cut through the stock thus producing good chips of uniform size throughout the entire length of the slabs, or other pieces of stock. The chips may then be discharged upon the web, 52, of the frame which forms a chute for delivering the chips to a conveyor, (not shown), for carrying them to the chip sizer or crusher.

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

1. In a chipping machine, the combination with a feed trough, of a reciprocating knife frame, adjustable knives fitted in said frame, fixed guide-ways for said knife frame, adjustable wedges for said guide-ways, and means for reciprocating said knife frame.

2. In a chipping machine, the combination with a feed trough, of a main frame having vertical guide-ways, a knife frame mounted in said guides, knife blades fitted in said knife frame, a crank shaft mounted in said main frame, and connecting rods for reciprocating said knife frame in the guides.

3. In a chipping machine, the combination of a feed trough, transverse feed rolls at the bottom of said trough, and a series of vertically movable vertical press plates mounted in said trough and adapted to bear at their lower edges upon the stock, said press plates being adapted to act by gravity and formed to have elongated forwardly and downwardly inclined lower edge surfaces to facilitate entry of the stock.

4. In a chipping machine, the combination of a feed trough, means for feeding the stock through the trough, and a series of vertically and separately movable vertical press plates mounted in said trough and adapted to bear at their lower edges upon the stock, said press plates being adapted to act by gravity and formed to have elongated forwardly and downwardly inclined lower edge surfaces to facilitate entry of the stock.

5. In a chipping machine, the combination of a feed trough, means for feeding the stock through the trough, and a plurality of sets of vertically movable vertical press plates mounted longitudinally in said trough and adapted to bear at their lower edges upon the stock, said press plates being adapted to act by gravity and formed to have elongated forwardly and downwardly inclined lower edge surfaces to facilitate entry of the stock.

6. In a chipping machine, the combination of a feed trough, means for feeding the stock through the trough and a plurality of sets of alternately arranged and independently movable press plates mounted longitudinally in said trough, the plates of the rearward set being extended forwardly within the plane of and between the plates of the advanced set, substantially as described.

7. In a chipping machine, the combination of a feed trough, transverse feed rolls at the bottom of the trough and having surfaces provided with sharp edges, a series of vertically movable vertical press plates

mounted in said trough and adapted to bear at their lower edges upon the stock by gravity, and automatic mechanism for intermittently turning said rolls.

8. In a chipping machine, the combination of a feed-trough, means for feeding the stock through the trough, means for cutting the stock at the inner end of the trough, a plurality of sets of vertically movable press plates suitably supported to bear upon the stock by gravity, the plates of the respective sets being positioned in alternate spaced relation with the plates of the advanced set positioned in close proximity to the cutting means for bearings upon the last end pieces of the stock and the plates of the rearward set being extended longitudinally within the plane of engagement of the advanced plates.

9. In a chipping machine, the combination of a feed trough, means for feeding the stock through the trough, knives for cutting the stock at the inner end of the trough, a set of vertically movable vertical press plates mounted at the inner end of the trough close to said knives, and another set of vertical press plates mounted at an intermediate portion of the trough, the plates of said latter set being arranged in alternate spaced relation with the plates of the former set and extended forwardly between said plates to overlap in their plane of engagement.

10. In a chipping machine, the combination of a feed trough, means for feeding the stock through the trough, knives for cutting the stock at the inner end of the trough, a set of vertically movable vertical press plates mounted at the inner end of the trough close to said knives, another set of vertical press plates forwardly extended between the plates of the first set, and means for supporting the first mentioned set of plates upon the other set.

11. In a chipping machine, the combination of a main frame, cutting means supported thereon and a feed trough for delivering the stock to the cutting means, said feed trough being slidably mounted upon the main frame to permit of its being moved away from operating position to give access to the cutting means.

12. In a chipping machine the combination of a main frame supporting the cutting means, a feed trough for delivering the stock to the cutting means, stock advancing means supported within the feed trough and said feed trough being slidably mounted upon the main frame to be movable away from operating position to give ready access to the cutting means, substantially as described.

13. In a chipping machine, the combination of a main frame carrying a movable knife for cutting the stock, a slidably mounted feed trough carrying a fixed knife

and adapted to be moved against the main frame for cutting, and away from said frame for giving access to the knives.

14. In a chipping machine, the combination of a main frame carrying a movable knife for cutting the stock, supporting bars, a feed trough carrying a fixed knife and slidably mounted on said bars.

15. In a chipping machine, the combina-

tion of a main frame carrying a movable knife for cutting the stock, horizontal bars supported at one end on the main frame, a feed trough carrying a fixed knife and slidably mounted on said bars.

In testimony whereof I have hereunto set my hand.

LOUIS H. STREET.