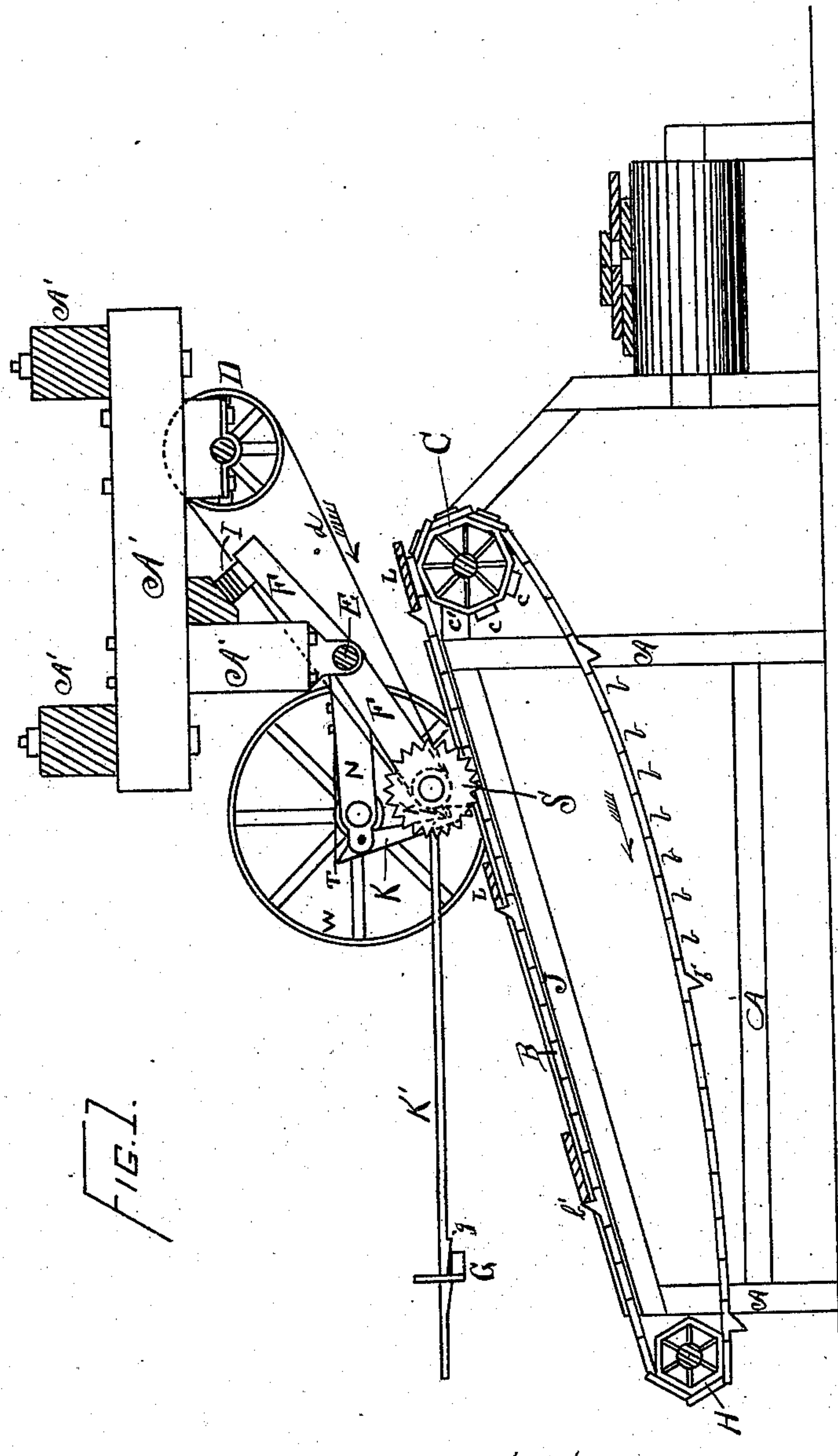


(No Model.)

2 Sheets—Sheet 1.

E. H. STEARNS.
Lumber Trimming Machine.
No. 238,815.
Patented March 15, 1881.



WITNESSES:

Cyrus F. Dean,

D. H. Dean.

INVENTOR:

E. H. Stearns,

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ATTY.

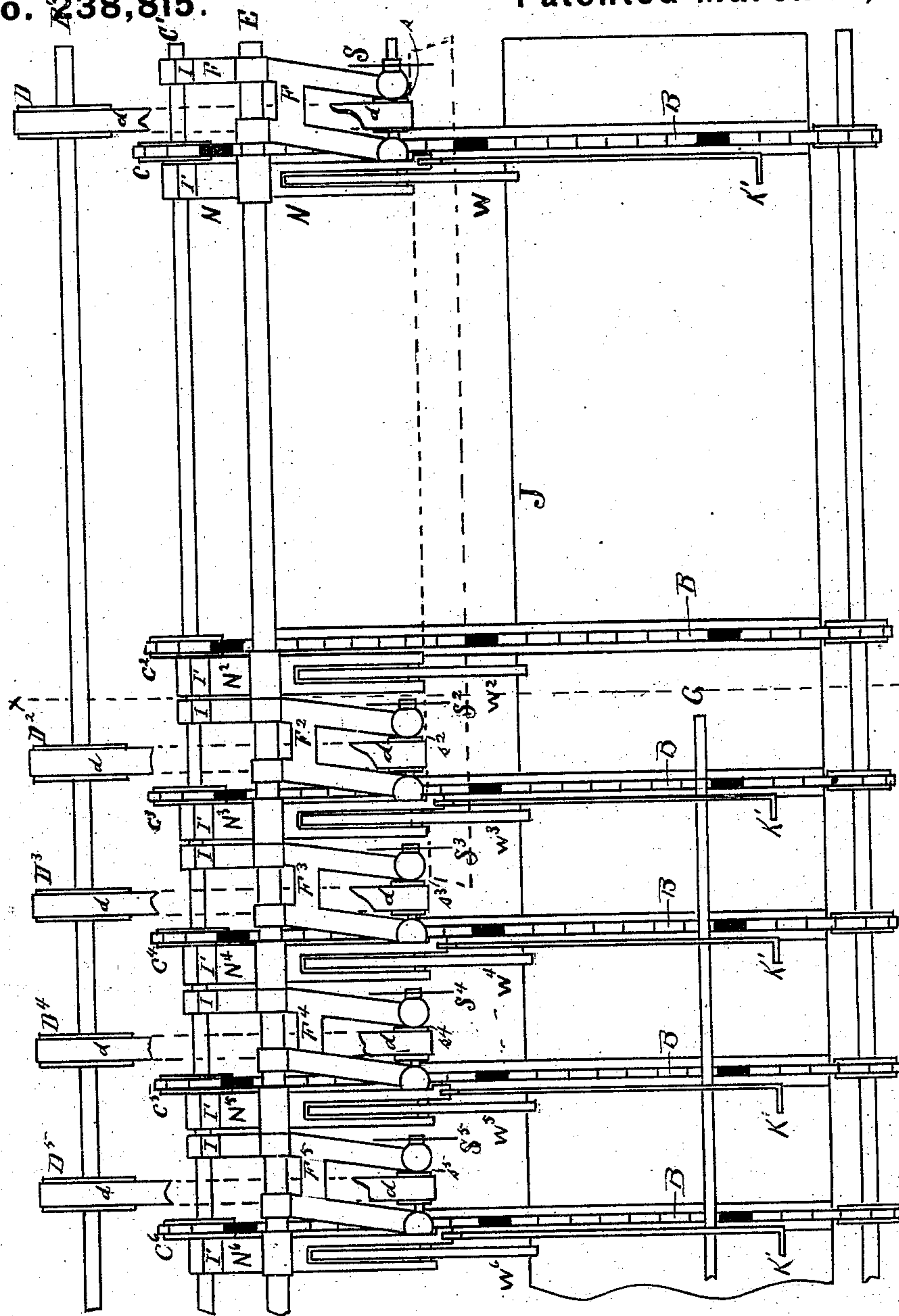
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FILE 2.

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INVENTOR:

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ATTY

UNITED STATES PATENT OFFICE.

EDWARD H. STEARNS, OF ERIE, PENNSYLVANIA.

LUMBER-TRIMMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 238,815, dated March 15, 1881.

Application filed July 9, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDWARD H. STEARNS, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Lumber-Trimming Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to the construction of machines for trimming lumber; and it consists in improvements in the arrangement and operation of the saws, and in the devices for feeding the lumber to the saws.

The object, purpose, and scope of my invention will fully appear in the following description and claims.

In the accompanying drawings, my device is illustrated as follows: Figure 1 is an elevation of the end of the machine, taken from the right end of Fig. 2. This may be called the forward end of the machine. Fig. 2 is a top or plan view, with the upper frame-work, A', (shown in Fig. 1) omitted.

My machine may be said to consist of two parts, viz: first, the table and the devices attached thereto for conveying the lumber across it; second, the saws, saw-frames, and the devices attached thereto for operating the same. The former of these parts, to wit, the table and lumber-feeding devices, are placed on the floor of the mill, while the latter, to wit, the saws, saw-frames, and devices for operating the same, are attached to frame-work overhead, and operate dependently therefrom.

In all lumber-trimming machines which cut both ends of the lumber at the same time with which I am acquainted, the saws, saw-frames, belts, levers, &c., are arranged below the table and operate upwardly through the top of the same. The consequences of such a construction are that the parts are not easy of access for repair, oiling, &c.; the belts which operate the saws are not of sufficient length to give perfect traction; the off-fallings have got to be conveyed away and not permitted

to fall through the table, because, if they did, they would clog the machinery or break it or be thrown out and endanger persons adjacent, and if permitted to accumulate on the table, they will pile up and foul the movement of the chains and crowd against the saws and injure the machine. Another defect in the machines as at present constructed arises from the construction and means for moving the feeding-chains, which carry the lumber to the saws, and consists in their liability to slip and get the lugs thereon which push the lumber out of range, and so carry the boards to the saws obliquely. In my device I do not avoid the liability of the chains slipping or being thrown out of place; but when they do so slip the machine becomes practically inoperative, and the operator is compelled to fix them in place, while in the forms now in use the operator may neglect to readjust the chains so as to bring the lugs in line, and go on sawing lumber off diagonally. The means I employ are to have certain links in the chain without sprocket-openings, and certain faces of the sheaves over which the chains run made without cogs or pins. This will appear fully hereinafter.

By my construction all the difficulties I have above named are avoided and many benefits are gained.

My machine is constructed as follows:

A A is the frame-work of the table, which is of ordinary form, except that its top is open under the saws, and may be entirely open, or it may be covered as far as from J to J'.

A' A' is a proper frame-work overhead for sustaining the sawing apparatus. This frame-work may be attached to the joist overhead, or it may be supported by proper frame-work.

B B, &c., are the chains which convey the lumber across the table to the saws, and are called "feed-chains." L L represent the lumber being so conveyed. The chains B are formed of links *b b* and lugged links *b'*.

C and H are the sheaves over which the chains run, of which C is the working sheave, and is provided with teeth *c* upon all of its faces but one, *c'*. If the sheave is of sufficient circumference it may have more than one blank face, which should be placed at regular intervals. The chain-links should have holes in them for the cogs of the sheave, except at

intervals corresponding with the intervals at which the blank faces of the sheaves occur. A link should be used at those points having no opening. By this means, if the chains should slip for any reason the blank link would come on a face of the sheave having a cog, and this would practically make it inoperative, or, at least, enough so to require the immediate attention of the operator for correction and re-
 10 adjustment.

As the lugged links of the chain b' are of peculiar construction I make them the closed or blank links; but this is not essential. So it will be seen that from one lugged link to another there are seven open links corresponding with the seven cogged faces of the sheaves C, and the lugged link b' intersects the blank face of the sheave. Other than as above stated the form of the links is optional.

20 The parts of the machine supported from above and operating dependently therefrom are as follows:

A main shaft, D' , extends parallel with the table, and bears as many belt-pulleys, D , D^2 , D^3 , &c., as are needed.

25 E is a shaft parallel with the main shaft, and has pivoted thereon a series of tilting frames F N F^2 N^2 , &c. In the frames F are mounted saws S S^2 S^3 , &c., on arbors s s^2 , &c., and in each of the frames N are mounted rollers W . The arrangement of the series of saw-frames with relation to the length of the table is the same as in many other trimming-machines, and needs not explanation by me. Each of the

35 saw-frames is connected to one of the roller-frames, and the two constitute a set. Thus F and N , F^2 and N^2 , F^3 and N^3 , F^4 and N^4 , F^5 and N^5 are so coupled together. One of the wheels and frames N^2 and W^2 are independent of any saw and serve only as a presser-roller, and ordinarily the saw-frame F and roller-frame N are disconnected and operate independently of each other, at which times the wheel W serves only as a presser-roller; but a connecting ap-

45 paratus is provided, and may be used when desired, as will be hereinafter explained. The means which I show for connecting these frames, but to which I do not desire to be limited, as many other devices may be substituted therefor, are as follows: A swinging catch, K , is attached to the wheel-frame and engages with a lug-catch, k , on the saw-frame, and when so engaged is held in place by a spring, T , or some equivalent device. These catches

50 may be disengaged by the pull-rods K' , and held back by locking the catches g thereon over the rod-support G . When these frames are engaged or connected together they will tilt together. Each of the frames in the rear

60 of the pivot-shaft are provided with buffers I , which abut against a part of the frame-work A' . By this means the frames can only tilt down toward the table a certain fixed distance. The adjustment here made is such that
 65 the wheels W drop slightly below the saws S ; therefore when a wheel runs over the passing lumber (see L , Fig. 1) the saw connected there-

with, as explained, will be raised sufficiently to clear the lumber and not saw it. Only the saw whose accompanying wheel does not pass over the lumber will saw the lumber unless it is uncatched or disconnected from the same. As both ends of the board are to be sawed off, and as the saw S at the head of the table would not saw that end of the board unless it was disconnected from the wheel, it is necessary to leave that saw disconnected until for some reason it is not desired to saw that end of the board; but the other saws should all be left connected to the rollers, unless for some reason it is desired to saw the board off at some intermediate point.

To understand the operation of my machine let it be supposed that the passing board is of the length indicated by dotted lines in Fig. 2. It will be seen that wheel W^3 will pass over it. Consequently saw S^2 will not saw it; but wheel W^4 is beyond the end of it and will not pass over it. Consequently saw S^3 will saw it off; and so it will be through the series of sets. If the board were so long that the wheels W^4 and W^5 would run over it, and not wheel W^6 , then saw S^5 would cut it off. If, however, the operator, who stands at the lower side of the table, should see a board passing up which had a defect in it so far from the end that the saw which would cut it off would not cut off the defect, he can drop one of the other saws down, so as to do it by pulling out the proper catch or pull-rod K' .

It will therefore be seen from the above that the operation of my machine is automatic except when a defect is seen, as above described, and then it is only necessary for the operator to draw out the proper pull-rod K' .

I am aware that other machines have been made in which the proper saws are brought into contact with the lumber automatically. For example, see the patent to Peter Musser, January 27, 1880, in which the saws are displaced through the top of the table by the boards passing over levers which protrude through the top of the table, while in my machine the saws are raised out of the way by the rollers W passing over the lumber. In the Musser machine presser-rollers are used to give the board sufficient weight to depress the levers which carry down the saws. I use rollers for two purposes: first, to roll over the lumber and lift up the saws, and, second, to hold the lumber down against the lifting action of the saws while sawing it off.

It will be seen by noting the arrows in Fig. 1, that my saws cut upward through the board. The object of this is to prevent the possibility of the saws climbing over the board without sawing it, a contingency which arises by reason of the frames in which the saws are mounted being adjusted to tilt upward. This contingency, however, can be avoided, if so desired, by weighting the saw-frame sufficiently if it is desired to run the saw in the opposite direction—that is, so as to cut down through the board.

In my machine all the off-fall or trimmings immediately drop below the table, and do not accumulate on the table to clog the machinery, as they do in such machines as Musser's and others, wherein the sawing apparatus are arranged below the table, and the table-top is covered to prevent the off-fall falling through the table. In the Musser machine the accumulation of the off-fall or trimmings on the top of the table clogs the action of the levers by getting under the same and prevents their automatic action. In my machine nothing can accumulate on the table, and hence there is no fouling of the machine. Attaching the sawing apparatus over head, and causing the same to operate downward therefrom, is of very great importance, and may be applied to machines in which the saws are operated by hand-levers as well as to automatic machines.

Other devices than those I show for raising the saws may be used. For example, the ends of the saw-frames, or of frames like the roller-frames, may be provided with shoes in place of rollers, which will slide over the lumber like a sled-runner.

The rollers or runners may be permanently attached to the saw-frames, if it is not desired to have the saws operate independently thereof at certain times; or they may be attached to the saw-frames, and yet be provided with means for changing their position, so as to permit the saws to cut when they run over the lumber.

I am aware that saws for cutting off lumber, slabs, &c., have been attached to frame-work pendent from above, but they in no way anticipate my invention, for I do not claim, broadly, the mounting of a saw in a frame which is pendent from above.

What I claim as new is—

1. In a lumber-trimming machine, a table, and means substantially as shown for conveying the lumber across the same, in combination with sawing apparatus dependent from above said table, and devices, substantially as named, connected thereto for automatically raising and lowering or otherwise displacing said saws as said devices are acted upon by the passing lumber.

2. In a lumber-trimming machine, the combination, substantially as shown, of the following elements: a table across which the lumber is carried by feeding mechanism substantially as shown, saws mounted in frames which are dependent from above said table and movable from and toward the same, devices, substantially as shown, for moving said saws from and toward said table when acted upon by the passing lumber, and a catch device, substantially as shown, for detachably connecting said saw-frames, and said devices for moving said saw-frames, and thereby enabling the operator to permit or not permit the saws to be raised from the table when said devices for moving said saws pass over the passing lumber.

3. In a lumber-trimming machine, the combination, substantially as shown, of the following elements: a table across which the lumber is fed by feeding mechanism substantially as shown, saws mounted in frames which are dependent from above and movable from and toward said table, rollers adjusted in frames which are also dependent from above and are movable from and toward said table, and are connected in the order named to said saw-frames, and thereby cause said saw-frames to move from and toward said table when said rollers pass over lumber moving on said table.

4. In a lumber-trimming machine, the combination, substantially as shown, of the following elements: a table across which the lumber is fed by feeding mechanism substantially as shown, saws mounted in frames which are dependent from above and movable from and toward said table, devices, substantially as named, attached to said saw-frames, for raising said frames and saws by the lumber passing under the same.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD H. STEARNS.

Witnesses:

JNO. K. HALLOCK,
S. S. SPENCER.