UNITED STATES PATENT OFFICE.

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A. WOODS, OF SAME PLACE.

IMPROVEMENT IN PLANING-MACHINES.

Specification forming part of Letters Patent No. 142,460, dated September 2, 1873; application filed
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To all whom it may concern:

Be it known that I, WILLIAM H. GRAY, of
Boston, in the county of Suffolk and State of
Massachusetts, have invented an Improvement in Planing-Machines; and I do hereby de-
clare that the following, taken in connection
with the drawings which accompany and form
part of this specification, is a description of
my invention sufficient to enable those skilled
in the art to practice it.

In feeding lumber to planing and other re-
ducing machines, and especially to tonguing
and grooving machines, it is customary to use
feed-rolls geared to run together by gears at
one or both ends of one roll meshing into
gears which are driven by gears meshing into
and driving the gears upon one or both ends
of the other roll, the connecting-gears being
placed upon shafts mounted in stationary bear-
ings, while the shafts or gudgeons of the feed-
rolls rotate in movable, or relatively movable,
bearings, that permit the rolls to approach or
separate, in accordance with the thickness or
varying thickness of the stock, the boxes of
the upper roll being preferably connected with
weighted levers, by means of which the pres-
sure is brought to bear upon the upper roll,
which pressure may be regulated by move-
ment of the weights. As the rolls are gen-
ernally mounted and arranged the pressure of
the upper roll is equal upon the stock, if the stock
is entered at the center of the rolls; but if it
enters at either side of the center the pres-
sure is unequal, as the rolls only separate at
such side, or separate unequally, the entrance
of the stock causing separation at the point
of entrance, while the weight at the opposite
end of the roll tends to press such end down,
the result being an angular separation, and a
consequent unequal bearing or pressure upon
the respective parts of the lumber. This gives
to the lumber a tendency to feed angularly and
away from the guide, and prevents its proper
presentation to the tonguing and grooving or
reducing cutters. The unequal separation of
the rolls also produces angular strain upon
the gear-teeth, under which strain the teeth
are apt to break.

In my invention I have sought to remedy
these difficulties; and I effect the desired re-
sult by combining with the mechanism that
supports the respective boxes of the upper
or presser-roll, and produces and regulates pres-
sure of the roll, a connecting mechanism, by
which the movement of either box insures a
and consequent uniform pressure of the whole
bearing surface of the roll upon the stock, at
whatever point it may enter the rolls.

In the ordinary arrangement one box may
move to, or nearly to, the extent of its capa-
bility of movement, while the other remains
stationary; but with my invention they must
move as one, unless the mechanism is pur-
posefully arranged for relative movement; and
my invention consists, primarily, in combining
with the presser-roll a link, lever, or connect-
ing mechanism, by which both boxes of the
presser-roll have simultaneous and equal move-
ments, and the roll a consequent uniform press-
ure throughout its length.

The drawing represents a feed-roll mechan-
ism embodying the invention.

Figure 1 is a vertical section on the line x
x of Fig. 2. Fig. 2 shows the mechanism in
elavation. Fig. 3 is a vertical section on the
line x x of Fig. 2. Fig. 4 is a modification.
Fig. 5 is a view of the rock-shaft and weighted
lever.

a denotes the frame; b c, the two feed-rolls.
The journals of the lower roller rotate in boxes
d, which may be adjusted by screws e, and the
journals of the upper roller rotate in vertically
movable boxes h. On the lower roller shaft or
journals are gears g, which mesh into and
drive gears f, said gears f meshing into and
driving gears i, which, in turn, engage with
and drive the gears k of the upper roller, the
intermediate gears i f being fixed on the in-
termediate shafts t, rotating in stationary bear-
ings. Each box h of the upper or presser roll
is supported by pivotal screws or pins j upon
the tops of vertical slide-rods m, sliding in
guide-boxes n, the rods being connected at
foot by a cross-bar, α, and the two bars α o
being connected to levers p p, bearing weights
q q, by the stress of which the presser-roll is
drawn down to increase its pressure, and by
movement or adjustment of which this pressure
may be regulated. This connection is ef-
fected as follows: A shoe, \( v \), mounted upon each lever, has extending up from it rods \( s s \), upon the tops of which is fastened one end of a lever, \( t \), which, extending across the machine, has its opposite end pivoted in the housing-frame. Between the rods is a screw-shaft, \( v v \), working in a nut-thread in the bar \( o \), the upper part of this shaft or screw passing through a slot in the end of the lever, the lever being grooved at the back of this slot, and a collar upon the screw extending into the groove, permitting the screw to turn, but keeping the screw in position vertically, or the lever and screw relatively immovable as to vertical position. By raising the weighted lever, upward movement is imparted to the end of the lever \( t \), and through it to the screw \( v \), bar \( o \), slide-rods \( m m \), and journal-box \( h h \). This movement might be imparted to one box only, if the two levers \( t t \) acted independently one from the other, or if there were no connection between the two boxes; but, to insure equal movement of both boxes, the two levers \( t t \) are pivoted at the center by a pin \( w \), one end of each lever being connected with the mechanism of the box at the same side of the machine, and the other end resting upon or being pivoted to the housing-frame at the opposite side of the machine, the result being that, as either lever \( t \) is moved up or down, it imparts a coincident movement to the opposite lever, insuring the equal movement of both boxes, and of the whole length or every part of the presser-roll journalized in said boxes. By withdrawing the pivot-pin \( w \) each box \( h h \) may act independently of the other; but, when connected, the uniform pressure of the roll over the whole face of the stock is insured. To adjust the extent of downward movement of the presser-roll the screw-shafts \( s \) have at their tops bevel-pinion \( x \), which pinions mesh into bevel-pinions \( y \) on a cross-shaft, \( z \), turning in stationary bearings, rotation of this shaft raising the journal-boxes \( h h \) or letting them fall, and determining the distance of the presser-roll from the bottom roll when the presser-roll is in its lowest position. The supporting mechanism for the opposite boxes may be otherwise connected to produce the uniform movement and pressure of the roll; but I prefer the organization substantially as shown.

In Fig. 4 each screw is shown as connected to a horizontal arm, \( o o \), of a three-armed lever, \( P P \), having two vertical arms, said lever being pivoted to a stationary projection from the frame \( o o \), and each vertical arm of the lever being connected to the arm of the other lever, extending in the opposite direction, so that the two connecting-links cross, such connection insuring the same movements of both screws. The horizontal arms of the three-armed levers might be jointed to the bars \( o o \) or to the rods \( m m \); but, preferably, they are jointed as shown in Fig. 4.

In Fig. 5 the connection is made between the levers \( p p \) by a horizontal rocker-shaft having projecting from its opposite ends arms jointed by links to the weighted levers. In such case, as with an arrangement similar to that is shown in Fig. 5, the levers \( t t \) would be dispensed with, and each elevating screw-shaft \( v v \) would be kept in place by suitable collars upon the shaft above and below a cross-plate that connects the rods. The boxes \( h k \) of the presser-roll are pivoted upon the tops of the slide-rods \( w w \) by screws, which permit the box to move vertically in the vertical plane of the rolls, and the rods fit to and slide in the vertical boxes \( n n \) made in a stationary housing-frame, the connection of the box-supporting rods and their cross-bars with the levers \( t t \) being effected as described. This arrangement insures perfect freedom of vertical movement of the boxes by connections that are strong, simple, and enduring.

The pivotal screws \( j j \), it will be seen, are in the plane of the axis of the presser-roll. This avoids all injurious consequences incident to placing the bearings above the axis of the roll, or to connecting the rods rigidly to the boxes, such as the difficulty or impossibility of preserving parallelism of the roll, strain and wear of the axis, journal, and vertical rods, &c.

I claim—
1. In combination with the presser-roll, supported by or upon independent boxes, the connecting-levers \( t t \), to insure uniform pressure, substantially as described.
2. The combination of rods for guiding and supporting the upper roll-boxes with weighted levers connected by links to a rock-shaft, substantially as and for the purpose described.
3. As a means for connecting each box \( h k \) and its lever \( p p \), the combination of the rods \( m m \), jointed to the box, the bar \( o o \), rods \( s s \), screws \( v v \), and yoke \( r r \).

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Witnesses:

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