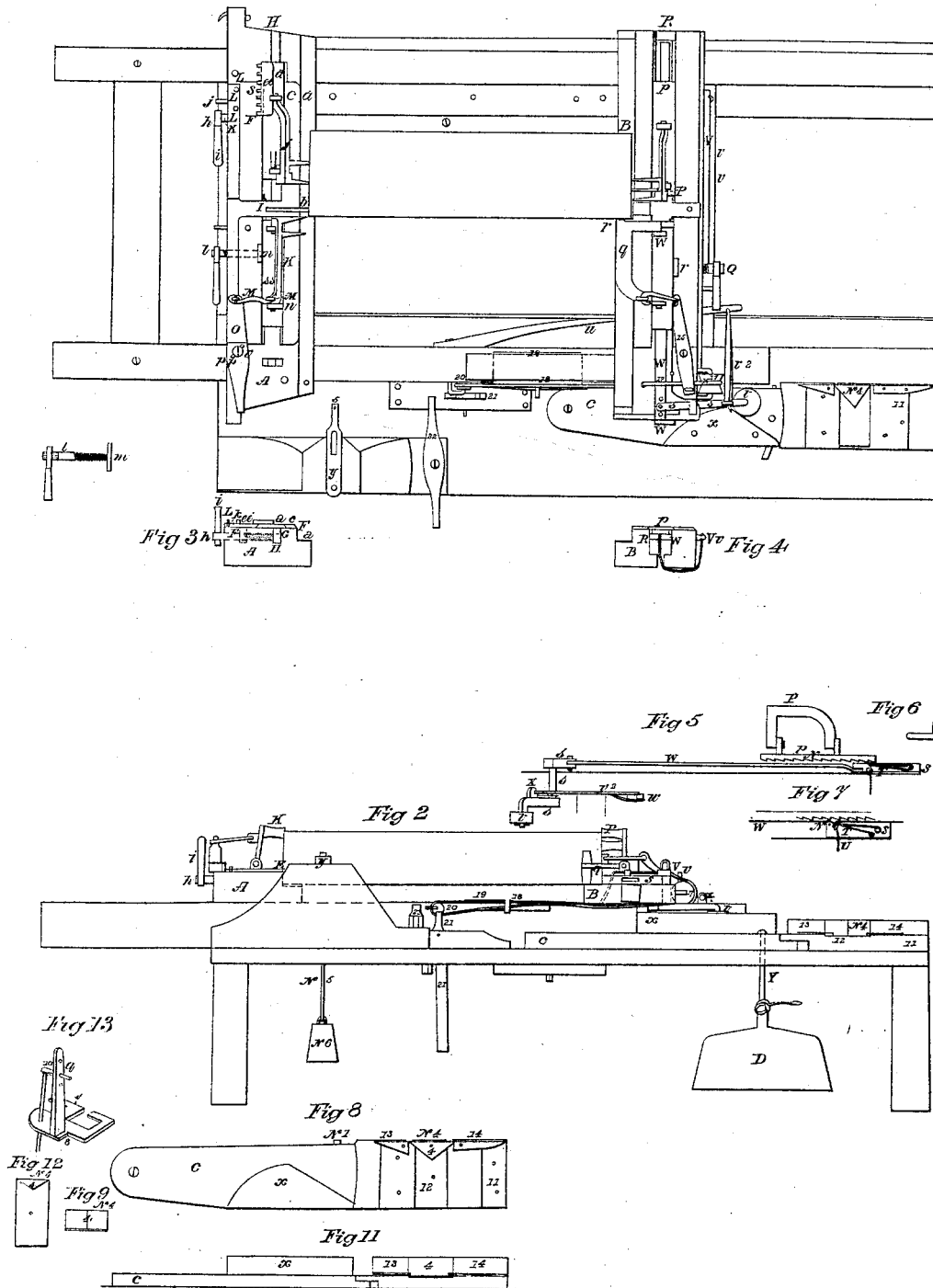


H. Thurber,
Saw-Mill Head-Block.

N^o 755.

Fig 1

Patented May 30, 1838.



UNITED STATES PATENT OFFICE.

HEZEKIAH THURBER, OF PAINTED POST, NEW YORK.

SAWMILL-DOG.

Specification of Letters Patent No. 755, dated May 30, 1838.

To all whom it may concern:

Be it known that I, HEZEKIAH THURBER, of Painted Post, in the county of Steuben and State of New York, have invented an improvement in the construction of sawmill-dogs, head and tail blocks of the sawmill-carriage, and especially in the mode of using the dogs and the means or apparatus by which they are moved, used, and applied; and I do hereby declare that the following is a full and exact description of my invention, reference being had to the annexed drawings.

In order to describe my invention, and explain its operation intelligibly, so that others skilled in the art may be able to make and use it, I describe other parts not claimed herein as my invention, but connected with it in the construction and arrangement of the parts, and in the use and operation of my invention, and after that distinguish and define more particularly what I claim as my invention.

First. I construct the principal frame of the carriage in the common form of saw-mill carriages.

Second. The head block (A, Figures 1 and 2 and 3 in the drawings hereto annexed) movable on the carriage, as in the common construction, so as to be adapted to the length of the log, is about 22 to 24 inches wide, and 9 inches thick. The upper and inner corner or edge of the head-block (a) is rabbeted off 5 inches, by $1\frac{1}{2}$ inches deep, the whole length of the block, to receive the log, and hold it from slipping or moving lengthwise, after it is rolled onto the carriage. The lower or horizontal part of the rabbet is lined with band iron, or other metal plate $\frac{1}{4}$ inch thick 5 inches wide, made fast with screws; and the perpendicular side of the rabbet is also lined in the same manner, to prevent the log wearing the block, and on and against which iron or other metal plates the log easily slides and moves. The band iron or plates here described, and also the other plates and castings hereafter described which are fastened on the top of the head block, are separated at the middle, that is, consist of two parts, a space being left between them at the middle of the head block, 3 inches wide, to give sufficient room and space for the saw when the carriage is giggered back, the saw, in that situation of the carriage, standing back its entire width in the head

block at (b), Fig. 1. A plate or band iron E, Figs. 2 and 3 $\frac{1}{4}$ inch thick, 2 inches wide, $2\frac{1}{2}$ feet long, extending from the end of the head block next the log-way, to the division before described for the reception of the saw, is screwed or riveted on the top of the head block next the rabbet before described, the edge being in the line of and coming in contact with the top of the perpendicular lining of the rabbet. This plate is for the purpose of forming with the casting next described, a horizontal groove for the dog-slide hereafter described. An iron casting (c Figs. 1, 2, 3) $\frac{3}{4}$ inch thick of the same length as the plate of band iron described, placed in the same position to the head block, is fastened to the headblock by bolts or screws passing through it, and through the said iron plate into the head block. One edge of this casting consequently corresponds exactly with the perpendicular line of the before described rabbet. This casting is 2 inches wide at the top by $1\frac{1}{4}$ inches at the bottom, the upper half projecting $\frac{1}{4}$ inch over the lower half on the side from the rabbet, so as to make a horizontal groove the whole length of the casting $\frac{1}{4}$ by $\frac{1}{4}$ inch, in which the slide (d) moves as hereafter described. A slide (d Figs. 1 and 3) to which the dog is attached, is of cast iron 20 inches long $3\frac{1}{2}$ inches wide at the top, 4 inches wide at the bottom, the lower half projecting $\frac{1}{4}$ inch, on each side, so as to fit snugly into the horizontal groove before described on the side next the rabbet, and on the other side into another groove made in precisely the same manner, by a plate F and lasting (e Figs. 1 and 3) of the same dimensions as the one first described, and fitted and fastened in the same manner. The slide, d is of the same thickness as the castings. The slide is cast, with a projection G Fig. 3 on the under side of the slide, one inch, by $\frac{1}{2}$ inch in width, in the middle, and extending the whole length of the slide. This projection of the slide downward fits into and moves in a corresponding groove H cut in the block. The groove H is cut out the same length as the castings on the top of the block before described—that is, from the end of the block to within $1\frac{1}{2}$ inch from the saw. The slide slips out at the end of the block when desired, and can move the other way toward the center of the headblock only to the end of the groove. The groove being

cut nearly through to the saw, the slide may be stopped and held at that end by a strip of iron I Fig. 1 fastened down on the top of the block and near the edge of the groove turned up at the end next the saw; the slide passing over this strip of iron till it comes to the end turned up, is stopped and held by it.

The dog (*f*) which is a half-bail dog, is attached to the slide by means of ears which are raised on the slide toward the inner end thereof, that is, toward the end of the slide next the saw, and which are cast with the slide. The dog is of wrought iron, and moves with the slide, being attached to it as above described.

(*e e*) a plate of cast iron 4 inches wide 1 to 1½ inches thick and the same length with the dog-slide, is riveted on the top of the dog-slide, projecting over the slide on the side toward the head of the head-block, or side from the log when placed on the carriage, about half the width of the said cast iron plate. This plate is cast with cogs or notches (*g*) an inch deep, and one inch wide, on the projecting side of the said plate. The said plate is not flat, but the side or edge in which the cogs or notches are cast is raised so as to make an angle of about 20 degrees with the plane of the slide. The cogs and notches are cast for the purpose of receiving the end of the mill bar, which is used as a lever to move the dog slide, and with it the log when the log is dogged.

A block or plank *k* Figs. 1 and 3 2 inches thick, same length with the castings, and of sufficient width to extend from the castings to the outside of the head block, is pinned on the top of the head block between the castings and the outside of the head block, that is, the side toward the head of the mill. The corner or edge next the castings is worked off to the same thickness with the castings. Two iron pins *L* are set in this upper plank or block 3 inches from the cogs, and at convenient distance apart, and are used as fulcras, against which the mill bar rests in moving the slide as before described. These pins should rise about three inches from the block and are 1½ inches in diameter.

A screw bolt (*h*) 1½ inches diameter at the head passes through the head block horizontally from the outer side of the head block, about midway of the castings before described, or 14 inches from the end of the head block next the log-way. This screw bolt passes in a groove cut horizontally across the head block and of a depth nearly equal to the diameter of the said screw-bolt, and is held down in the groove by the plank or block which is pinned on the top of the head block as before described, which block or plank is also slightly grooved so as to fit snugly over the said screw bolt. A nut is placed vertically between the head block

and the said plank or block which is fastened on it in such position corresponding with the said groove that the screw bolt passes through it and is held by it. The screw is cut on the bolt only in that part which passes through the nut. The end of the said screw bolt as will be perceived from the position in which it is placed, comes in contact with and presses against the lower projection *G* of the dog-slide before described, and the object and design of the said screw bolt is to hold the said slide stationary. The said screw bolt is of sufficient length to reach the said projection of the slide, the head of the said screw bolt at the same time standing out about 2 inches from the outer edge of the head block. The head of the screw bolt is made eight square or round and perforated for a lever-bar.

A lever bar (*i*) of wrought or cast iron 15 inches long 1 inch diameter, with an eye corresponding to the head of the bolt, fits tightly on the head of the said screw bolt. The extreme end or head of the said screw bolt is cut a screw, and receives a nut for the purpose of holding the lever bar fast on the screw bolt as before described. At the distance of about half the length of the said lever bar, on each side of the said screw bolt and in a horizontal line with the said screw bolt, in the outer edge or side of the head block are iron bolts or pins standing out about 3 inches from the headblock on which the lever bar rests when turned down toward one or the other end of the head block as the case may be, that is, according as the screw bolt is turned to press up against the projection in the slit or loosened from it, as the case may be.

The other end of the head block is constructed and described as follows: Iron castings of the same form and dimensions in every respect, except length (which is 16 inches) and in the same position in respect to the saw and the ratchet in the head block, as the castings before described for the other end of the head block, and are placed upon plates for the purpose of forming horizontal grooves as before, are fastened to this end of the head block. These castings are in line with the others. A slide is adapted to the grooves in the same manner as before described, and of the same form, except that there is no projection on the under or lower side, and the length is only 12 inches. A half bail dog which is also called a gage dog (*K*) is attached to this slide in the same manner as before described.

The slide *ss* carrying the gage dog *K* just mentioned is held at any point desired, according to the thickness of plank to be sawed, by means of a screw *l* passing horizontally through the head block in the same manner as the screw bolt (*h*) before de-

scribed and is likewise turned by a lever or handle inserted into the eye in its head, or slipped over it when the eye is in the end of the lever, except that instead of the screw pressing against a downward projection from the slide it presses against a vertical plate *m* placed between the edge of the slide and end of the screw, a mortise being made in the casting forming the groove of the slide to admit said plate to play freely, and said plate extending down into the block.

A wooden lever (*o*) 2 feet long, rests upon the head block. The hand-end of the lever comes out even with the end of the head block. A wooden pin (*oo*) $1\frac{1}{2}$ inches in diameter, fastened perpendicularly in the headblock, one foot from the end of the headblock, and 8 inches from the outer edge or side of the head block, and rising 4 inches from the headblock, is the fulcrum on which the lever moves and to which the lever is held, the pin passing through the lever by an auger hole in it. A $\frac{1}{2}$ inch pin (*pp*) passes through the top of the perpendicular or fulcrum pin to keep the lever from coming off. The lever is so shaped or fashioned that the hand end and center where the fulcrum pin passes through it is about 2 inches thick, and the other end 4 inches. In the top, and as near the end last mentioned as may be a staple is driven (the shanks of the staple standing in a line transverse to the line of the lever, and so that the staple will be open toward the hand end of the lever). A staple is also placed in the bow-leg of the gage dog, about 3 inches above the ear. This staple is connected with the staple in the end of the lever last described by an iron link *M* 8 inches long $\frac{3}{4}$ inches diameter, so that the gage dog is raised and let down by the horizontal motion of the lever. Pins are driven in the head block, one near the hand end of the lever and one near the other end, on the side next the slide and castings, to prevent the lever swinging or moving too far, it being necessary when the dog is raised to throw it a little back of a perpendicular line so that it will be prevented from falling forward again by its own weight, and when let down toward the rabbet it is sufficient that it be let partly down, say 45 degrees.

The tail block (*B*, Figs. 1, 2, 4) is the same length as the head block and projects over the frame of the carriage on the back side of the carriage, that is, the side from the log way, about 10 inches. The tail block is 18 inches wide, is rabbeted down to receive the end of the log in precisely the same manner as the head block, and the rabbet lined with band iron in the same manner. Plates of iron on the top and castings of the same size and pattern forming horizontal grooves for dog-slides, are fas-

tened in the same manner and in the same relative position as on the head block before described.

At the center of the block between the slides an iron plate 3 inches wide is screwed down to prevent the dogs sliding quite together, and so interfering with the saw when it runs through the log.

Slides with dogs attached in the same way as described in the head block and of the same construction move in the horizontal grooves in the same manner with the exception hereafter particularly described. The dog-slide for the first end of the tail block (*p*) that is, the end next to the log-way instead of the projection downward, as in the corresponding slide in the head block, is cast with notches or teeth on the under side (N Figs. 5 and 7) extending the whole length of the slide. These teeth or notches are $\frac{3}{8}$ inches deep and $\frac{3}{8}$ in. apart $2\frac{1}{2}$ in. long, that is, extending $2\frac{1}{2}$ inches across the bottom, or under side of the slide. The teeth or notches are perpendicular on the side toward the first end of the head block, and standing the other way at an angle of 45 degrees. These notches or teeth are designed for a hand *O* to work in, which will be described hereafter. A tooth *P*, Figs. 1, 2, is made in the dog leg next the center of the nail block lower down than the other teeth, to hold a small log when necessary.

The gage dog (*q*) for the other end of the tail block is constructed after the same fashion as the other dogs, except that the tooth next the center of the block is drawn out, or extended back about 8 inches making a *T* Fig. 6 with the leg of the dog, and when the dog is turned down on the rabbet, forms with the tooth a perpendicular gage of 12 inches in length. The slide containing the gage dog of the tail block is held by means of a screw *Q* and plate *u* similar to *l* and *m* before described.

A mortise is cut in the tail block, where the saw comes, at the center of the block (*r*) 3 inches wide $1\frac{1}{2}$ inches deep below the horizontal part of the rabbet, and into the tail block horizontally 5 inches beyond the rabbet. This mortise is filled with a block driven tightly in, and can be driven out when necessary by a pin from the opposite side or edge of the tail block. The saw calf is cut into this block, and when by the uneven motion of the saw the saw-calf becomes inconveniently large a new block is put in.

A groove *R*, Fig. 4, is cut in the tail block, in the line of the dog-slides from the end of the tail block opposite the log way, to within ten inches of the other end. This groove passes under the slides, is $2\frac{1}{2}$ inches wide and $\frac{3}{4}$ in. deep, except the 12 inches of the groove, toward the end of the tail block next the log way, which is mortised out to

the depth of $2\frac{1}{2}$ inches, and width of 3 inches. This last part of the groove is for the purpose of receiving and holding a box spring and hand hereafter described.

5 An iron box (S, Figs. 5, 7,) 8 inches long, $2\frac{1}{4}$ inches deep, $1\frac{1}{2}$ inches across the box (inside) open at the top on upper side; of cast iron $\frac{1}{2}$ in. thick, is made to occupy that part of the groove mortised out as last before described, and movable in it lengthwise the groove. A hand is made of wrought iron $\frac{5}{8}$ in. thick, of length and breadth to move freely up and down in the box. A rivet passes through the box horizontally, near the end of the box, toward the log way, about half way from the top to the bottom of the box, and through a hole in the end of the hand. The rivet holds this end of the hand, admitting a play of the other end up and down, the hand turning on the rivet as a hinge.

A steel spring T, Figs. 5, 7, 6 inches long, 1 inch wide, is riveted to the movable end of the hand, on the under side. The other end of the spring rests on the bottom of the box. This spring causes the end of the hand, to which it is attached, to rise unless drawn down in the manner hereafter described. The end of the hand which is movable as before stated is slightly turned up, and pointed with steel, and works in the teeth or notches before described in the bottom of the slide. The rivet which fastens the spring to the hand as before described, is formed with an eye on the under side of the spring. To this a cord U is fastened, which passes down through a hole in the bottom of the box, and through the tail block, by a mortise or hole cut through the block one inch wide by 6 in. long, so that the cord may move with the box. The other end of the cord is attached to a lever V v as hereafter described, Figs 1, 2 and 4.

An iron bar w, Figs. 1, 4, 5 and 7, $1\frac{1}{2}$ inches wide, $\frac{1}{2}$ in. thick is riveted to the end of the box next the center of the tail-block, and lies, and is movable in, the groove before described, under the dog-slides, extending to the end of the tail block, opposite the log way, being about 5 feet long. The end of the bar passes into the mouth of a crank, S, Figs. 1, 2, 5, and is held by a bolt passing down through the jaws of the crank through a hole in the end of the bar, forming a joint or hinge with the end of the crank. This bar is covered in the groove in which it works by a plate of sheet iron, to prevent the saw dust getting into the groove and impeding the free motion of the bar in the groove. The end or arm of the crank (5) to which the bar is attached in the manner described, is 7 inches long, of wrought or cast iron $1\frac{1}{2}$ inches square, lies horizontally and crosswise of the tail block, resting on it, running back from the before described bar,

toward the end of the carriage. The crank forms an elbow or turn at right angles, passing down through the tail block (outside the carriage frame) perpendicularly. This part of the crank is round, so as to turn easily in the tail block $1\frac{1}{2}$ inches in diameter and about 7 inches long. The crank then makes another turn or elbow at right angles, extending horizontally toward the end of the carriage by an arm parallel with the first described arm and 14 inches long. The end of the crank turns down about three inches, is rounded, and on it a cast iron roller, called a friction-roller (t), 4 inches in diameter $1\frac{1}{2}$ inches thick, turning horizontally on the end of the crank, and held by a washer riveted on the bottom end of the crank. The motion of the crank is horizontal, and being connected with the end of the bar as before described gives motion to the bar, box, and hand in the groove before described.

An eye X, is formed to the crank, near the end and just above the friction roller, on the side toward the carriage frame. The crank is let into its place in the tail block, by a mortise cut into the end of the tail block, and rests against iron boxes at the top and bottom of the tail-block, on the side of the crank from the end of the tail block. After the crank is let in, it is held to its place by a piece of wood $1\frac{1}{2}$ inch thick, 12 inches long, 7 inches wide, fastened by bolts or screws to the end of the tail block, with a projection in the form of a tenant, which fills the mortise by which the crank is let in and presses against the crank.

A wooden spring (u) of tough elastic timber, 2 inches square, 7 feet long, is fastened at one end on the inside of the carriage frame by a bolt passing through it and through the carriage frame at such point between the head and tail block, that the other end of the spring shall extend back 12 inches beyond the tail block, passing under the tail block. The spring is so shaped where it is fastened to the carriage that the other end of the spring stands out about 16 inches from the carriage. This end of the spring is connected by a cord (v^2) to the eye in the end of the crank before described.

A wooden lever (Vv) Figs. 1 and 4, 4 feet long is fastened to the tail block on the side or edge next the end of the carriage by a screw or bolt through the center of the lever into the tail block. This lever is so placed that one end comes out about even with the eye, in the hand spring, before described, and is connected to it by the cord fastened to the eye in the steel spring as before described. The use of this lever is, by bearing down the other end, to draw down the hand and disengage it from the teeth or notches in the bottom of the dog

slide before described. The lever is kept in this position when desired by a hook fastened to the tail block near the other end of the lever, which catches on to the end of the lever.

The dog-ears are $2\frac{1}{2}$ inches high, $\frac{1}{4}$ inch thick, 8 inches apart on each slide. The feet of the dogs are turned or bent the same way and go into the ears from the side next the center of the head block or tail block as the case may be, and are held in by a washer and pin. The dog teeth at the edge or end which enters the log are made half an inch wider than the upper or back part of the tooth, so that when driven into the end of the log the wood closes around the end of the tooth, and holds it faster to the log, as at Fig. 6.

A plank (C) Fig. 1, 10 feet long, 2 inches thick, 13 inches wide, lying on the floor of the mill, on the side of the carriage opposite the log way, 4 inches from the carriage frame parallel with it, is held by a pin passing through one end of the plank into the floor of the mill. The pin which holds the plank at this end is about 2 feet from the fender-post toward the tail block. The plank moves horizontally on this pin as a pivot or hinge. On the other end of this plank which extends from the pin last mentioned toward the tail of the mill, is fastened a piece of plank or timber (x) 2 inches thick, 13 inches wide in the widest part, $3\frac{1}{2}$ feet long on the longest side or edge, and projecting over the end of the plank on which it is fastened one foot. This upper piece of plank or timber is so placed upon the other that the longest side or edge comes out even with the outer edge of the lower plank, that is, the edge from the carriage. The corner of this upper piece of plank toward the fender post, and next the carriage is rounded off from the other corner next the fender post, so as to form part of a circle of 60 inches diameter. The other corner next the carriage is cut off from about midway of said piece of plank or timber, that is, from the point where the circular part next the carriage terminates and in a line which forms an angle of about 30 degrees with the line of the carriage frame. The shape of this piece of plank or timber here described is three sided, the longest side, from the carriage and in a line with the outer edge of the other plank, the circular side toward the fender post and next the carriage. The edge of this upper piece of plank or timber is bound with band iron except the side or edge from the carriage.

A cord Y Fig. 2, through a hole about the middle of this upper piece of plank, passes through the floor and over a pulley which is attached to a nog-beam under the floor. The rope is knotted at the end to prevent its drawing through the plank, and

a weight D attached to the lower end beneath the floor. A pin, No. 1, Fig. 8, in the floor 4 inches from the side of the carriage, prevents the movable end of the plank from coming nearer the carriage than 4 inches, which is its natural position, and where the weight (D) (Fig. 2) will hold it, unless pushed out by the friction roller attached to the crank, in the manner described hereafter. The floor is cut or grooved for the rope, so that the plank to which the rope is fastened, and between which and the floor a part of the rope passes, can swing out from the carriage and back again without wearing the rope. The pulley is placed under the outer edge or side of the carriage, so that the weight, by means of the rope passing over the pulley, draws the plank toward the carriage and against the pin in the floor before described.

A plank, No. 11, Figs. 1, 2 and 8, 3 feet long, 16 inches wide, 2 inches thick, extending from the movable end of the plank last described toward the tail of the mill; space enough being left between it and the movable end of the other plank C for the latter to play, and with the side snug against the outer side of the carriage, is pinned fast to the floor. Twelve inches of the center of this plank is cut out, crosswise the plank, and on the upper side to the depth of one inch, so as to admit a slide 12 Figs. 2, 8, one foot wide and one inch thick. This slide is movable in horizontal grooves formed by fastening strips or plates of band iron on the top of the plank and cross wise the plank, projecting $\frac{1}{4}$ in. over each side over the part halved or cut out as before described. This slide is kept in its place by a pin passing through it and through the plank into the floor. A triangular block, No. 4, 2 inches thick, 11 inches at the base, and the other two sides forming a right angle-triangle (or, the half of a 11-inch square block or plank, cut diagonally,) is pinned fast on this slide last described with the base or longest side next the carriage frame. The other two sides or edges are bound with band iron in a line or plane horizontally, with friction roller *t*, and occasion the motion of the crank bar and hand, in the manner and for the purpose hereafter described. Blocks 13, 14 made in the shape of a wedge 12 inches thick are fastened on the plank, on each side of the triangular block, with the side end toward the triangular block for the purpose of guiding the friction roller and helping it to rise or pass more easily around the said triangular block. See Fig. 8.

Eight and 11 feet from the fender post toward the head of the mill the posts or uprights are set, 3 feet apart, 4 inches square; the feet framed into nog-beams, and a piece of timber 4 inches square and 4 feet long is framed on the top of the uprights. The up-

per side of this cross piece is on the lever with the top of the head block, and is designed to support the lever hereafter described. Three feet back of the center of this piece, that is, on the side from the carriage, another upright is framed into the floor, or into a nog-beam and of the same height as the top of the cross piece.

A wooden lever (*y*, Figs. 1 and 2) 3 inches square and $3\frac{1}{2}$ feet long passes over the cross piece or frame last described movable horizontally on it, and held at one end on the post back of the frame by a bolt or pin passing down through it and into the post. The lever moves horizontally on this pin or bolt as a fulcrum.

A rope or cord No. 5 through a hole through the lever where it passes over the cross piece, through the cross piece, and down through the floor to the mill, knotted at the top to prevent its drawing through, has a weight No. 6 attached at the lower end. A pulley is set in the cross piece on each side of the hole through which the rope passes, on one or the other of which pulleys the rope works, as the lever is moved horizontally from the center of the cross piece toward one end or the other of it. When the force moving the lever is taken off, the weight underneath by means of the rope and pulley, brings it back to its place. The end of the lever reaches over the end of the headblock about 3 inches, so that when the saw is running through the log and the carriage moving toward the head of the mill the hand end of the lever which is fastened to the headblock as before described comes against and in contact with that part of this lever which projects over the head block, the lever on the headblock turns horizontally on its center pin and the gage dog connected as before described to this lever is raised up. This lever moves till it comes against the pins placed in the headblock for that purpose as before described. The other lever with the weight then gives way or moves around till it passes the lever on the head block, and is then brought back to its place by the weight attached to the rope. When the carriage is giggered back the levers work in the same manner, only they come in contact on the other side, and the gage dog is consequently thrown down or forward.

The design and application of the several parts before described will be further explained by describing their operation in the process of sawing. The first thing properly to be done is to set the gage dogs for the purpose of regulating the thickness of the stuff to be sawed. This is done by moving the gage dog in the headblock as the case may be, till the gage, that is the leg and tooth of the gage dog next the saw, stand at a distance from the saw equal to the thickness of the stuff to be sawed, that is, 1 inch or more, or

less, as the case may be. The gage dog in the tail block is set in the same manner. The log is then dogged, with the dogs on the log-way side of the carriage (the gage dogs being thrown back) and the slab taken off from the side of the log next the gage dogs. The saw runs quite through the log and the slab falls down on the ratchet. The dog slides are then slipped back toward the end of the head and tail blocks, and the teeth driven into the log near the side next the log way.

In order to move the slide in the tail block the lever before described at the tail block and connected by a cord to the hand under the slide, is borne down at the other end and held by the hook before described, and consequently the hand which works in the teeth on the under side of the slide is held down, so that the slide may be moved back toward the end of the tail block as above stated.

The log being dogged as last described, the hook is taken off the end of the lever and the hand let up into the notches in the bottom of the slide. The gage dog in the tail block is turned down on the rabbet, the perpendicular gage before described necessarily standing at a distance from the log where the saw has run through in taking off the slab equal to the thickness of the board next to be sawed.

The end of the crank on which the friction roller is, is then pushed out till it stands 7 or 8 inches from the side of the carriage, straining the spring, which is connected by a cord as before described to the eye in the end of the crank, also moving the box and hand in the tail block black from the center toward the end of the tail block the hand working over the notches or teeth, as the slide moves. The wooden spring being strained as before described, exerts a force or tendency to draw the box and hand connected with the crank as before described, toward the center of the tail block, which is prevented by the hand catching in the teeth on the bottom of the slide—the power of the spring not being great enough to move the slide and dog which is fast in the log. The carriage is next giggered back; and giggering back the gage dog in the head block is thrown forward by the action of the lever on the head block and the lever on the frame near it, as before described. The friction roller strikes against the circular edge of the piece of plank before described to which the weight is hung. The end of the crank on which the friction roller turns is consequently crowded or pressed toward the carriage. The other end of the crank consequently moves in the opposite direction and with it the box, hand, slide, dog and log, till the log comes in contact with and presses against the perpendicular gage before described, which stops it and prevents its moving farther. The plank against which the

friction roller is bearing then gives way moving on the pin which holds the other end of the plank as before described, and swings back from the carriage till the friction roller passes it, and is then brought to its place again by means of the weight, cord and pulley before described. The friction roller next strikes against the side or edge of the triangular block before described which bears the end of the crank from the carriage and consequently moves the box connected with the other end, and the hand under the slide in the opposite direction, the hand working in the teeth or notches of the slide till the friction roller has passed around or over the said triangular block; by which operation the hand gets a new hold in the teeth of the slide farther back from the center of the tail block, so as to draw the log up to the gage as before, when the carriage is gigged back again. The carriage being gigged back, the slide in the head block, and with it that end of the log is moved or slid up till the log comes in contact with and presses against the gage dog, this done by the sawyer with a mill bar, using it as a lever in the cogged or notched plate, which is fastened on the slide as before described, and in the manner before described. The gate is then hoisted and the saw runs through the log in the same manner as before leaving no stubshot. The board is raised over the gage dog in the tail block, (the other gage dog being thrown back by the levers as before described) and falls down on the rabbet or is removed. The carriage is gigged back again, all the parts working as before till the log is sawed up.

In sawing thick stuff, the triangular block, which is fastened to the slide in the manner before described, is moved and fastened farther out from the carriage, so as to give the end of the crank a farther motion or sweep, in passing over or around the point of the said triangular block, and consequently to move the hand farther in the teeth or notches of the slide, giving it a longer hold, which is necessary, as the log in being set to the perpendicular gage at each time requires to be moved farther to come in contact with it according to the thickness of the board taken out.

When the carriage is moving toward the head of the mill, that is when the saw is running through the log, the friction roller comes in contact with the slant side or edge of the other block or piece of plank through which the rope passes over the pulley as before described, bears it out, the plank turning on the pin in the other end till the roller has passed the block. The weight below by means of the cord and pulley then draws it back to its place parallel with the carriage.

In the foregoing description the carriage

is supposed to move toward the head of the mill, while the saw is running through the log. If constructed to move the other way, the several parts of the apparatus herein described must of course be adapted and placed in reference to the moving of the carriage in that direction.

In sawing very large logs and to prevent them canting over on one side a rest and support of the following construction is used at the end of the log on the tail block. It consists of a horizontal plate 7, Fig. 13, shaped so as to fit the sides of the ears of the tail block slide, with a right-angled piece taken out of one corner so as to leave a space 8 to admit the end of the log therein; from which plate rises a perpendicular standard 9 perforated with apertures to admit a horizontal dog 10 driven into the side of the log toward the log way. This standard is placed directly over the rabbet in the tail block.

The gage dog *g* of the tail block is also thrown back out of the way when a cut has been made in order to remove the board and is brought down into its place again when the log is to be pushed up against it in the following manner: A vibrating lever, 15 Fig. 1, similar to lever *O* of the head block is attached to the gage dog by a link also in a similar manner. To the end of the lever is attached a strap 16 which is passed over a pulley 17 and under the rail block and fastened to a slide 18. From the same end of the lever there extends another strap 19 down through an opening in the tail block onward horizontally to a pulley 20 at the side of the carriage over which it extends to the before mentioned slide where it is made fast.

The slide 18 for moving the lever and gage dog (*g*) is moved by coming in contact with a spring or weighted stop 21 and by means of a lever 22. The spring or weighted stop passes vertically through the floor of the mill and turns on a pin passing through ears erected thereon. The lever vibrates horizontally on a pin inserted into a block raised upon the floor.

When the carriage has advanced as far as it is intended to go the mill gate is closed in the usual manner. In letting down the gate a wedge fastened on the side of the gate staff comes in contact with the lever 22, presses one end back while the other end carries back the slide which draws the strap 19 and this vibrates the lever 15 which throws back the gage dog *g*.

In gigging back the carriage the slide comes in contact with the weighted or spring stop 21 and meeting with a resistance thereby causes the slide to be moved back again, thus vibrating the lever in the opposite direction and returning the gage dog to its former position.

The invention claimed and desired to be secured by Letters Patent, consists in—

1. The method of fastening the slides of the dogs and gage dogs as before described.
- 5 2. The combination and arrangement of the crank, the bar attached to it, box, hand and spring, teeth in the bottom of the slide, lever on the back of the tail block to hold the hand down, the wooden spring fastened to the carriage and attached by the cord to the end of the crank, the blocks against which the friction roller works and the parts to which they are attached fastened to the floor and the weight as before described.
- 10 3. The use of two, or double slides in each block, that is, the head block and tail block, instead of one, or a single slide; and the
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manner described herein of preventing the slides and dogs coming quite together, thereby preventing the possibility of the saw coming in contact with the dogs. 20

4. The teeth or cogs *g* on the edge of the plate *e* fastened to the dog slide as before described. 25

5. The additional plate, standard, and dog for supporting larger logs as before described.

6. The combination of the parts of the apparatus for moving the gage dog of the tail block as before described. 30

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Witnesses:

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