October 24, 1913.

DRAWING

3,715

A careful search has been made this day for the original drawing or a photolithographic copy of the same, for the purpose of reproducing the said drawing to form a part of this book, but at this time nothing can be found from which a reproduction can be made.

Finis D. Morris,

Chief of Division E.

AWK

UNITED STATES PATENT OFFICE.

E. C. GILMAN, OF CANAAN, NEW HAMPSHIRE.

MACHINE FOR SAWING LATHS AND CLAPBOARDS.

Specification of Letters Patent No. 3,715, dated August 23, 1844.

To all whom it may concern:

Be it known that I, ELIPHALET C. GILMAN, of Canaan, in the county of Grafton, in the State of New Hampshire, have invented a new and useful Machine for Sawing Lath and Clapboards; and I do hereby declare that the following is a full and exact description, and which, together with the accompanying drawing and written references, constitute my specification.

The description is of a small machine, which is in all respects one-fourth part of the dimensions of a machine, for actual use, and all measures expressed in these descriptions refer to the said small machine.

The timber of the principal frame is one inch square, in this machine, and the frame to which the driving shaft is attached is 10½ inches by 7¼ inches at the bottom, and 8 inches high to the top of the girt or cap-pieces (*a*, *a*), which extend 1½ inches beyond the posts (*b*, *b*) toward the attendant of the machine. To the right hand of the attendant and in the same line of the two parts of the frame next to him is a fifth post (*c*) of the same size, and projecting above the upper girt of the frame two inches. This fifth part is connected to the corner of the frame next to the right hand of the attendant, by two girts (*d*, *e*) 11½ inches in length, which makes the front side of the frame to be 23 inches. The driving shaft (*f*) is 7½ inches long and ½ inch in diameter and to it is attached the saw (*g*) and driving pulley (*h*). Thus far the frame and saw are not different from a common circular saw and frame, with the exception of the appendage of the 5th post and the two girts at the right hand of the attendant. The driving shaft is placed across the center of the frame.

To secure a reciprocating or forward and backward motion of the carriage (*i*) on which the stuff to be sawed is placed, is one of the principal objects of the machine, and that result is secured in the following manner: To the extreme end of the driving shaft (*f*) and outside the principal frame, opposite the attendant, is a pulley (*k*) ½ inch in diameter for sawing clapboards and outside that, one (*l*) for sawing lath ⅞ inch in diameter. On the same shaft between the driving pulley (*h*) and the saw (*g*) and next to the driving pulley, is a pulley (*m*) ⅞ inch in diameter designed to reverse the motion of the carriage in sawing lath, and another (*n*) next to the saw ½ inch in diameter, both pulleys are in contact; the last is to reverse the motion of the carriage in sawing clapboards. At the right hand corner of the frame on the side opposite the attendant, and two inches from the inside of the right hand post of the principal frame to the center of the bearings, is placed a second shaft (*o*, see horizontal section) of the same size of the other, on the upper surface of the lower girt (*e*) which brings the center of the shaft 2¾ inches from the bottom of the posts. On this shaft close to the bearings next the attendant, is a wooden pulley (*p*) 1⅛ inches in diameter and two inches long, designed to receive a round belt (*q*) passing several times around it so that it shall secure it from slipping on the pulley. One end of this round belt passes over a loose pulley (*r*) attached to the left end of the gage (*s*) at the back side of the saw, and is connected to a slide (*t*) running in a groove (*u*) in the movable gage, which lies on the table to gage the thickness of the stuff to be sawed. The other end of this round belt is attached to a perpendicular pin or knob (*v*) on which is cut a ratchet (*w*,) into which a dog (*x*) plays secured by a spring (*y*) so that by turning the pin or knob the sound belt can be tightened or loosened as occasion may require. The carriage (*i*) on which the stuff to be sawed is placed, passes by the saw, and this motion is secured by a piece of wood (*z*) attached to the right hand end of the carriage ⅜ in. long by $\frac{3}{16}$ inch wide and projecting by the carriage 1½ inches. This projection passes through a mortise (*a'*) in the slide (*b*) and when the round belt (*q*) draws the slide (*t*) the carriage is carried to and by the saw by means of this piece of wood. The carriage is drawn back by the round belt, which is attached to the pin or knob (*v*) at the right hand end of the carriage. This belt also passes over a loose pulley (*c'*) at the right hand end of the carriage. The reciprocating motion of the carriage is secured in the following manner: On the opposite end of the lower shaft (*o*) and next the bearing, is a gear wheel (*d'*) 3 inches in diameter. Into this gear meshes a pinion gear (*e'*) ⅝ inch in diameter attached to a shaft (*f*,) 3 inches long, one end of which has a bearing on the lower back girt and the other on a projection attached to the back girt. On the outer end of this short shaft is attached a wooden pulley (*g*) of two sizes, the less being 3¼

inches and the greater 3¾. A belt (*h'*) passes over this wooden pulley and onto the pulley (*l*) on the driving shaft, projecting without the frame. The pulleys, on both of these shafts, are proportioned to each other so that a belt of the same size will fit on to each. These outside pulleys are designed to secure the motion of the carriage toward the saw. On the same shaft (*o*) on which the large gear (*d*) is placed, and ¾ inch from it, toward the attendant, is placed a wooden pulley (*k'*) of two sizes in all respects like the other wooden pulley (*g'*) last above described. These pulleys are connected by a belt (*l'*) with pulleys (*m* and *n*) above described situated on the main shaft (*f*). Both the large gear and the wooden pulley on the same shaft run loose on the shaft. Between the gear and the wooden pulley is placed a dog (*m'*) one inch in diameter and ½ inch long. This dog is slipped on to a shaft between the gear and pulley and can be moved to the right or left by means of a lever (*o'*). On the shaft is a single pinion (or stud *p'*) adapted to a groove in the dog, so that the rotary motion of the shaft will carry the dog with it. Spurs (*q'*, *q'*) project from each side of the dog, one toward the gear and one toward the wooden pulley. There are corresponding spurs (*r'*, *r'*) projecting from the gear and from the wooden pulley toward the dog in such manner, that when the lever is moved to the right it shall fasten the dog to the gear, in which case the carriage will be driven forward; if the lever be moved in an opposite direction the gear will be liberated and run loose on the shaft, and the dog will become attached to the wooden pulley (*k'*) and the carriage is drawn back again. Or the dog may be left in such a position as to be disconnected with the gear or pulley, when the carriage will remain stationary. The apparatus for shifting the dog is composed of a double lever (*s'*) nearly at right angles, consisting of two legs (*u'*, *o'*) one of which is 2¾ inches and the other 6 inches long, having the fulcrum at the angle. This lever lies horizontally and is secured by a screw to the bottom girt near the right hand post at the corner opposite the attendant. It is adapted to a groove (*t'*) running around the dog, in such manner, that the motion of the lever to the right or left will move the dog on the shaft. The longer leg (*u'*) of the lever extends ½ in. past the front of the under side of the girt (*e*) extending from the main frame to the 5th post. This girt is raised one inch higher, than the girt in the main frame, for the purpose of securing it to that frame by a joint bolt, with greater ease. On to the end, of the projecting part of the long leg (*u'*) of the double lever, is placed a connecting rod (*v'*) supported to the under and outer edge of the girt, in such manner as to admit of a horizontal longitudinal motion in the same plane with the front of the machine. This connecting rod extends to the right side of the 5th post, (*c*) and passes through the bottom part of an upright lever (*w'*) and is loosely fastened by a pin or bolt in such manner as to admit of motion. Two and a half inches above this joint is a pin (*x'*) passing through the upright lever into the 5th post, which (pin) is the fulcrum of the upright lever.

On the top of the upper girt, is placed a horizontal iron plate (*y'*) two inches long, extending on each side of the 5th post ½ inch, and projecting beyond the girt toward the attendant, ⅛ of an inch. In the center of the upright lever and extending ¾ of an inch above and below the horizontal plate, is inserted a flat plate (*z'*) of iron and projecting about ⅛ of an inch toward the post.

It is now evident that if the upright lever be moved to the right it removes the dog (*m'*) to the right, when it will attach itself to the gear (*d'*) and the carriage will move toward the saw, and when we remove it to the left the dog is removed to the left, and becomes attached to the wooden pulley (*k'*) and the carriage is withdrawn from the saw. We will now remove the upright lever so far to the right that the dog shall connect itself with the gear and mark the point where the iron plate, in the upright lever intersects the horizontal plate lying on the top of the girt, and at that point should be cut a notch (a^2) in the horizontal plate sufficient to receipe the plate in the lever. This notch will hold the upright lever in place and the dog will remain fast to the gear (*d'*) until it is thrown out of the notch by other apparatus to be described. Shift the lever now to the left, until the dog has attached itself to the wooden pulley (*k'*) and note the point as above, and cut a notch (b^2) like the former; and now the motion of the carriage will be from the saw until the lever is thrown out of the notch as before. When this lever is perpendicular the carriage will be stationary, though the saw be in motion. To secure the lever in an upright position a latch or detent (c^2) is attached to the top of the 5th post in such manner that it can fall out from the post at right angles, and drop into a notch (d^2) at the top of the lever, when the lever will remain in that position until the latch be removed. Attached to the upright lever, are two steel springs (f^2 e^2) having their fastenings opposite the fulcrum of the lever. When not compressed these springs recede from the top of the lever 1¼ inches. Besides the motion of the upright lever (*w'*) from right to left, the top of the lever may be moved out and in sufficient to be fastened in the notches (a^2 b^2) and disengaged from them. A small spring (g^2) at the bottom crowds or bears the bottom of the lever out from the post

and by the same force tends to press the top toward the notch. The motion of the lever to the right and left, as well as the motion to disengage it from the notches, is secured in the following manner. A small piece of wood or metal (h^2) $\frac{1}{4}$ inch square and 18 inches long is placed on the upper edge of the upper girt next the attendant passing over the horizontal plate (y') and let into the 5th post (c) $\frac{1}{4}$ inch in such manner as to pass easily to the right and left above the horizontal plate and the upper surface of the girt. At the right hand end of this slide, and attached to it, and projecting toward the upright lever is an irregular piece of brass or other metal (l^2) $3\frac{1}{2}$ inches long of the thickness of the slide. This piece of brass lies upon the horizontal iron plate in which the notches are cut. When the dog is disengaged from the gear and from the wooden pulley, the upright lever will stand in a perpendicular position, parallel with the 5th post. When the dog and the upright lever are in this position the front edge of the brass piece (l^2) which rests on the horizontal plate, falls back of the front edge of the horizontal plate $\frac{1}{8}$ of an inch, so that the perpendicular plate (z') in the upright lever may pass into the notches, in the horizontal plate and the lever become stationary. The center portion of the brass piece, projecting toward the upright lever for the space of $1\frac{1}{2}$ inches is straight. At each end of this straight portion of the brass piece, commences inclined planes (h^a l^2) gradually projecting toward the upright lever, at such an angle that in a distance of $\frac{1}{4}$ of an inch, the inclined plane (operating like a camber upon the upright lever,) shall be sufficient to disengage the latch (c^2) in the upright lever from the notch (d^2) and permit the lateral motion of the lever to the right or left. If now the lever be fastened in the right hand notch (a^2) the motion of the slide (h^2) to the left will bring the inclined plane (l^2) or camber against the perpendicular iron catch (z') in the lever and throw it out of the notch (a^2) and so of the other notch (b^2) when the slide is moved to the right. From the termination of the inclined plane and extending either way to the right and left, the brass is straight for the distance of $\frac{3}{8}$ths of an inch, when the brass is turned toward the lever at right angles, forming a projection (m^2) of $\frac{1}{4}$ an inch. These projections (m^2 m^2) are designed to operate upon the springs (f^2 e^2) which are attached to the upright lever. When the slide moves to the right the square portion (m^2) of the brass piece, at the corner comes in contact with the spring (e^2) on the lever and compresses it one inch toward the lever, before the inclined plane or camber (h^2) disengages the lever from the notch; the force of this spring is then sufficient to throw the lever in an opposite direction and to disengage the dog (m') from the wooden pulley (k') and to attach it to the gear (d') and so vice versa. On the upper side of the slide (h^2) at the left hand end there is placed projection (o^2) one inch long and $\frac{1}{8}$ inch thick, and $12\frac{1}{4}$ inches from the inside of that projection begins another projection (p^2) of the same dimension on the upper side of the slide. A piece of wood (q^2) two feet long $\frac{3}{8}$ inch thick and $1\frac{1}{8}$ wide is placed on the upper girt next the attendant and nearly in contact with the saw. This piece of wood constitutes a portion of the ways on which the carriage passes. The other portion of the ways consists of a piece of wood (r^2) of the same length and thickness $\frac{1}{4}$ inch wide, and is the portion of the ways nearest the attendant, and is removed from the first described portion of the ways $1\frac{1}{8}$ of an inch. The carriage to run upon these ways, and on which the stuff to be sawed is placed is described as follows, viz: in length is $14\frac{1}{2}$ by $2\frac{1}{2}$ inches and $\frac{1}{4}$ inch thick. The head block (s^2) at the left hand end is $2\frac{1}{2}$ inches long, $\frac{1}{2}$ inch wide and $\frac{1}{4}$ inch thick. The right hand head block (t^2) $1\frac{1}{4}$ inches wide, $2\frac{1}{2}$ inches long and $\frac{1}{4}$ inch thick. Attached to the right hand head block and extending to the right hand edge of the carriage is a piece of wood (Z as before described) $\frac{1}{4}$ inch thick and $4\frac{1}{2}$ inches long and $\frac{1}{2}$ inch wide extending across the end of the carriage and $1\frac{3}{4}$ inches beyond and passing through the slide in the gage, by means of which (piece of wood) the carriage is carried toward the saw. At the lower edge of the carriage next the attendant extends a lip (v^2) $\frac{1}{4}$ inch square, from end to end of the carriage. This lip drops below the upper surface of the portion of the carriage ways next the attendant $\frac{1}{4}$ of an inch. Between this lip and the attendant passes a piece of wood (w^2) of the thickness and length of the ways, $\frac{1}{2}$ inch wide and $\frac{1}{4}$ inch from the nether portion of the ways, thus making a groove (c^3) sufficient to admit the lip of the carriage to pass in. The purpose of the lip and groove is to keep the carriage in place. The slide (h^2) to which is attached the piece of brass (i^2) moves in contact with the first described portion of the ways, at the end only, the intermediate portion being cut away to the extent of $\frac{1}{8}$ of an inch to form a groove (c^5) to admit the lip (d^3) of a camber (e^3) projecting from the under side of the carriage to pass between the slide and the first described portion (q^2) of the ways. This camber is $1\frac{1}{2}$ inches long by $\frac{3}{8}$ inch wide. The lip (d^3) of the camber projects $\frac{1}{4}$ inch beyond the main portion of it. This camber is placed $1\frac{1}{2}$ inches from the right hand end of the carriage, extending $1\frac{1}{2}$ inches to the left. It must be placed in such a position that the lip may pass in

the groove (c^5). In this position it will be evident, that when the carriage (i) has moved by the saw (g) till the lip (d^3) of the camber on the under side of the carriage comes in contact with the camber (f^3) at the left hand end of the slide it will carry the slide with it until it brings the inclined plane (l^2) on the brass piece at the right hand end of the slide against the perpendicular latch (z') in the upright lever (w') when the dog (m') is disengaged from the gear (d') and the motion of the carriage is reversed, and moves to the right till the lip (d^3) and the camber (e^3) comes in contact with the camber (or projection p^2) at the right hand end of the slide (h^2) and the inclined plane (k^2) on the brass piece (i^2) again disengages the upright lever (w') from the notch (b^2) and the dog is again attached to the gear (d') and the carriage is again moved to the saw.

The gage (w^3) to regulate the thickness of the stuff to be sawed, is described as follows: The piece (s) passing by the saw is 26 inches long and is composed of two pieces of wood having a longitudinal groove (k^3) passing from end to end $\frac{1}{4}$ inch wide and deep. These two pieces are separated $\frac{1}{4}$ of an inch by pieces of wood $\frac{1}{4}$ of an inch thick, so as to permit the slide (t) to pass in the groove to an extent equal to the motion of the carriage. The length of the slide is 8 inches, and at the left hand end the round belt (q) is attached, which is passed several times around the wooden pulley (p) $1\frac{1}{8}$ inches in diameter on which the large gear (d') is attached.

The gage (s) is fastened to the table back of the saw, by hand screws (r^3 r^3) in the usual way. At the right hand end of the slide is attached a dog (s^3) to hold the stuff in place while sawing lath.

For the purpose of sawing clapboards or other timber beveling or thicker at one edge, than the other, the following apparatus is required: On the top of the gage at a point near the saw is attached an iron (t^3) projecting toward the attendant $\frac{3}{8}$ of an inch, and at the right hand end another similar piece (u^3). At the end of each of these pieces and pointing inward is a spur or central (v^3) on which is suspended the movable gage (w^3) described as follows: Its length is $15\frac{1}{2}$ inches its width $1\frac{1}{4}$ and it is $\frac{1}{4}$ inch thick. It is made with a groove (x^3) to correspond with the groove in the principal gage (s) and to permit the cross-piece (z) at the right hand end of the carriage to pass through the end of the slide (t) which moves in the principal gage. This movable gage is thus suspended at the ends on the spurs or centers. Back of this movable gage at each end above and below is attached to the principal gage a support (z^3) which extends upward so as to prevent the movable gage from being moved over or under the desired point of inclination. At the right hand side, of each of the three girts or supports, which extend from the upper girt toward the attendant are suspended by hinges 3 levers (a^4, b^4, c^4) of the following form. They are each 4 inches long, and $\frac{1}{4}$ of an inch thick; at the top they are 1 inch wide, and at the bottom $\frac{1}{2}$ inch. These three levers are connected at the bottom by a piece of wood (d^4) $\frac{3}{8}$ of an inch square. Upon the tops of these 3 levers the nether portion of the carriage way is placed, a pin (e^4) tightly fastened into the way, passing loosely into the upper ends of the levers. If now these levers are left to hang perpendicularly by the sides of the girts to which they should be secured by the hinges, at their left hand upper ends the upper ends will be in a line with the upper surfaces of the girts, and the nether portion of the carriage way will support the carriage at right angles with the saw, and whatever shall be sawed will be square. If the bottom of the levers are moved to the right the nether part of the carriage way is raised and with it the carriage to any desired point of inclination. This lateral motion of the levers is secured in the following manner, $5\frac{1}{2}$ inches from the left side of the 5th post a stud (f^4) 1 inch wide and $\frac{1}{4}$ of an inch thick is attached to the upper and lower girts in a perpendicular position. A lever (g^4) attached to the bottom of the stud (f^4) on the front side, at the left hand edge and extending upward to the bottom of the carriage is connected by a wire (h^4) to the bottom of the middle lever (b^4). If now the top of the lever (g^4) be moved to the right, it draws with it all the levers, (a^4, b^4, c^4,) they being connected by the bottom piece (d^4) into which all 3 are inserted. On the right hand edge of the stud (f^4) and two inches above the upper surface of the lower girt, A pin (k^4) projects at right angles with the stud toward the attendant. This pin passes through h a lever (l^4) inserted into the piece (d^4) connecting the three levers together, and this lever also passes upward to the bottom of the carriage, and is an antagonist to the lever (g^4) last before described. These levers (g^4 l^4) are thus connected together, in such manner, that the motion of either to the right or left, will operate upon the three levers (a^4 b^4 c^4) connected by the connecting rod (d^4) and will in that manner raise or depress the nether carriage-way and with it the carriage. The tops of the two last described levers (g^4 l^4) are $\frac{1}{4}$ of an inch square and pass up through a flooring (m^4) which is extended between the three girts, a little below their upper surfaces. The floor is cut away sufficient to permit the levers to move to the right or left $1\frac{1}{4}$ inches. This will leave $\frac{1}{4}$

inch of the floor to intervene between the inner surfaces of the levers, the entire space being the distance betwen the opposite edge of the nether carriage way and the movable side (h^2) to which the brass piece (i^2) is attached at the right hand, resting on the horizontal plate (v'). Between the tops of these last described levers (g^4, l^4) is placed a horizontal lever (n^4) 6 inches long, of the following form and description at the right hand end, it is $\frac{3}{8}$ of an inch thick and at the widest place is $\frac{1}{2}$ inch wide, whence it gradually recedes by inclined planes, (o^4 o^4) on both sides to the extent of one inch, at which point the lever is secured by a pin, or pivot (p^4) passing perpendicularly through the lever to the floor (m^4) beneath. This lever retains the same thickness $\frac{1}{4}$ of an inch past the pivot, being at that point $\frac{1}{4}$ of an inch wide and $\frac{3}{8}$ of an inch thick. From this point the lever is reduced to $\frac{1}{8}$ of an inch in thickness, and tapers to a point. This form of the lever will permit the left hand point toward the attendant to move in an horizontal position till it comes in contact with the nether carriage way, or in an opposite direction till it comes in contact with the movable slide (h^2) on which the brass piece (i^2) is attached. This motion is secured by the action of the tops of the levers (g^4 l^4) passing alternately on the inclined plane to the right hand of the pivot. These upright levers moving, the one on the nether and the other on the farther side of this portion of the horizontal lever, secure this lateral motion of the horizontal lever. The purpose of this lateral motion, is to guide a set or pointer (q^4) hereinafter described attached to the bottom of the carriage in such manner, that the backward motion of the set or pointer which is carried by the carriage shall, alternately carry back the top of each of the levers and thus alternately raise and depress the side of the carriage next to the attendant. Thus the motion of the front edge of the carriage up and down will bring the stuff to be sawed in such a position, that the upper and lower edge of the board will be alternately thick or thin.

The set or pointer (q^4) used to drive the top of the levers back is described as follows: Attached to the under side of the carriage in such a position as to be over and at the left of the horizontal lever (n^4), is a piece of wood (q^4) 6 inches long and $\frac{1}{4}$ of an inch square or a little less. A little to the left of the center of the carriage and over the space occupied by the horizontal lever this piece of wood is secured in a mortise (s^4), and fastened by a pin (t^4) loosely fitted in such manner that the right hand end may move to and from the attendant to the extent of $\frac{1}{4}$ of an inch and may drop $\frac{1}{4}$ of an inch from the under surface of the carriage. When the carriage is in motion the right hand end of this set or pointer will move on the floor. The right and left motion of the horizontal lever will guide it alternately to the top of one lever (g^4) or the other (l^4). When the lever next the attendant is driven to the right, the left hand end of the horizontal lever is pointed toward the attendant and the set or pointer returns, being drawn over the thin part of the horizontal lever and on its return, it drives back the other upright lever, and the horizontal one points in a direction from the attendant, in which case the nether portion of the carriage way is elevated. To secure the upright lever next the attendant in place, and also to prevent the carriage, which lies on the nether part of the ways from acting on the 3 upright levers (a^4 b^4 c^4) a spring (u^4) is attached to the floor (m) in such a manner and of such a form, that the antagonist lever next the attendant shall be secured in place till the set or pointer shall return and crowd back the spring and the top of the lever. To guide and conduct the stuff after it has passed the saw until it shall fall off the table, a guard (v^4) should be attached to the gage (s), extending over the center of the saw. This will prevent the stuff from being thrown back to the danger and inconvenience of the attendant. About one inch back of the saw a perpendicular iron plate (w^4) two inches high should be erected in the same plane of the saw to prevent the stuff from coming in contact with the saw after it has passed it.

I claim as my invention—

1. The combination of mechanism which acts in such manner as to connect the dog (m') alternately with the gear (d') and the wooden pulley (k'), as described in these specifications.

2. I also claim as my invention the combination of mechanism for elevating the side of the carriage, next the attendant; in such manner, as to secure the proper degree of bevel for the stuff to be sawed, the same being effected by means of the three levers (a^4 b^4 c^4) suspended by hinges and the two uprights antagonist levers (g^4 l^4) and the connection between them and also the combination between these and the horizontal lever, etc. as described in these specifications.

E. E. GILMAN.

Witnesses:
R. H. EDDY,
JOHN NOBLE.