

(No Model.)

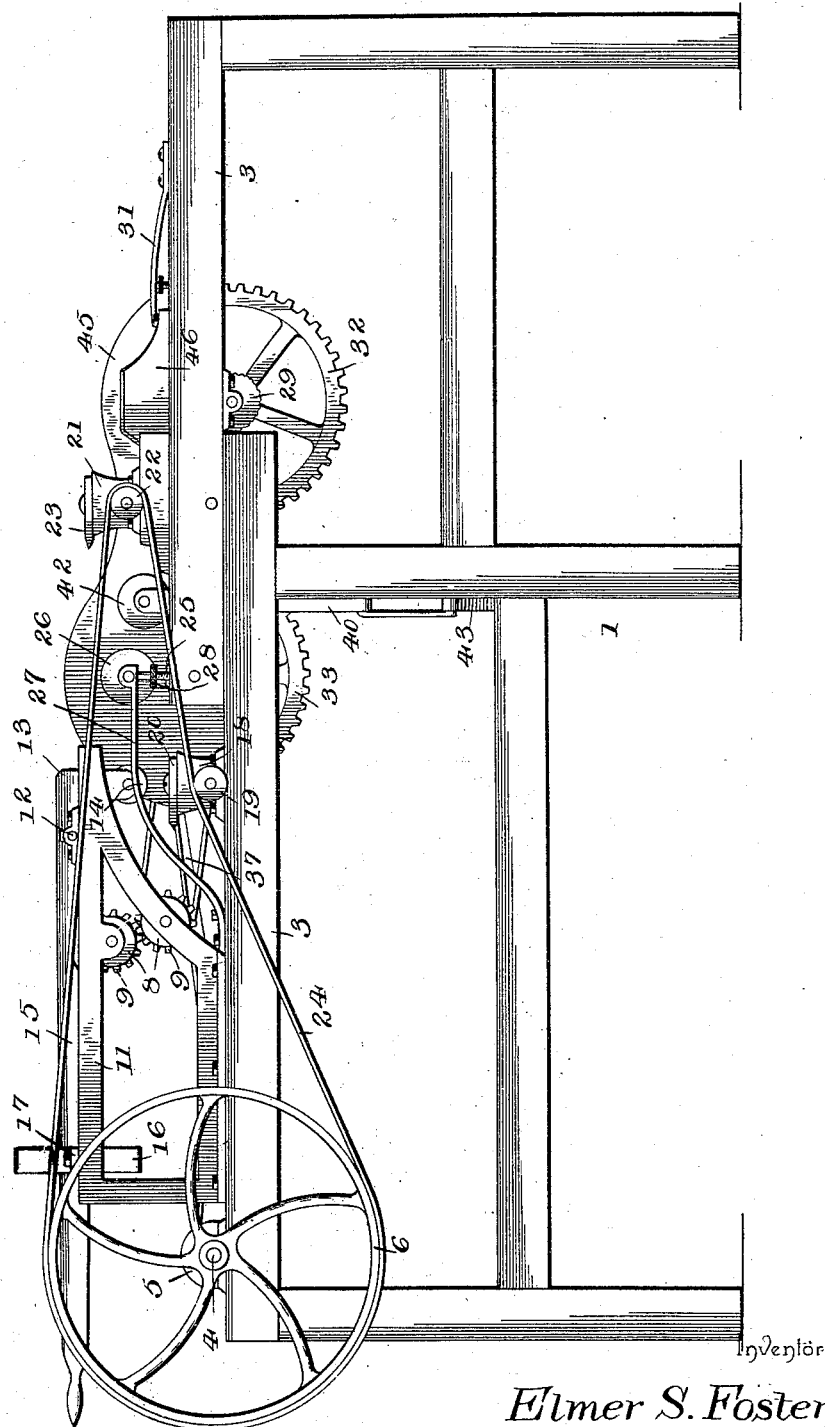
3 Sheets—Sheet 1.

E. S. FOSTER.
HOOP MAKING MACHINE.

No. 553,282.

Patented Jan. 21, 1896.

Fig. 1.



Witnesses

Chas. A. Ford,
R. M. Smith,

By his Attorneys.

Elmer S. Foster,

Cash & Co.

(No Model.)

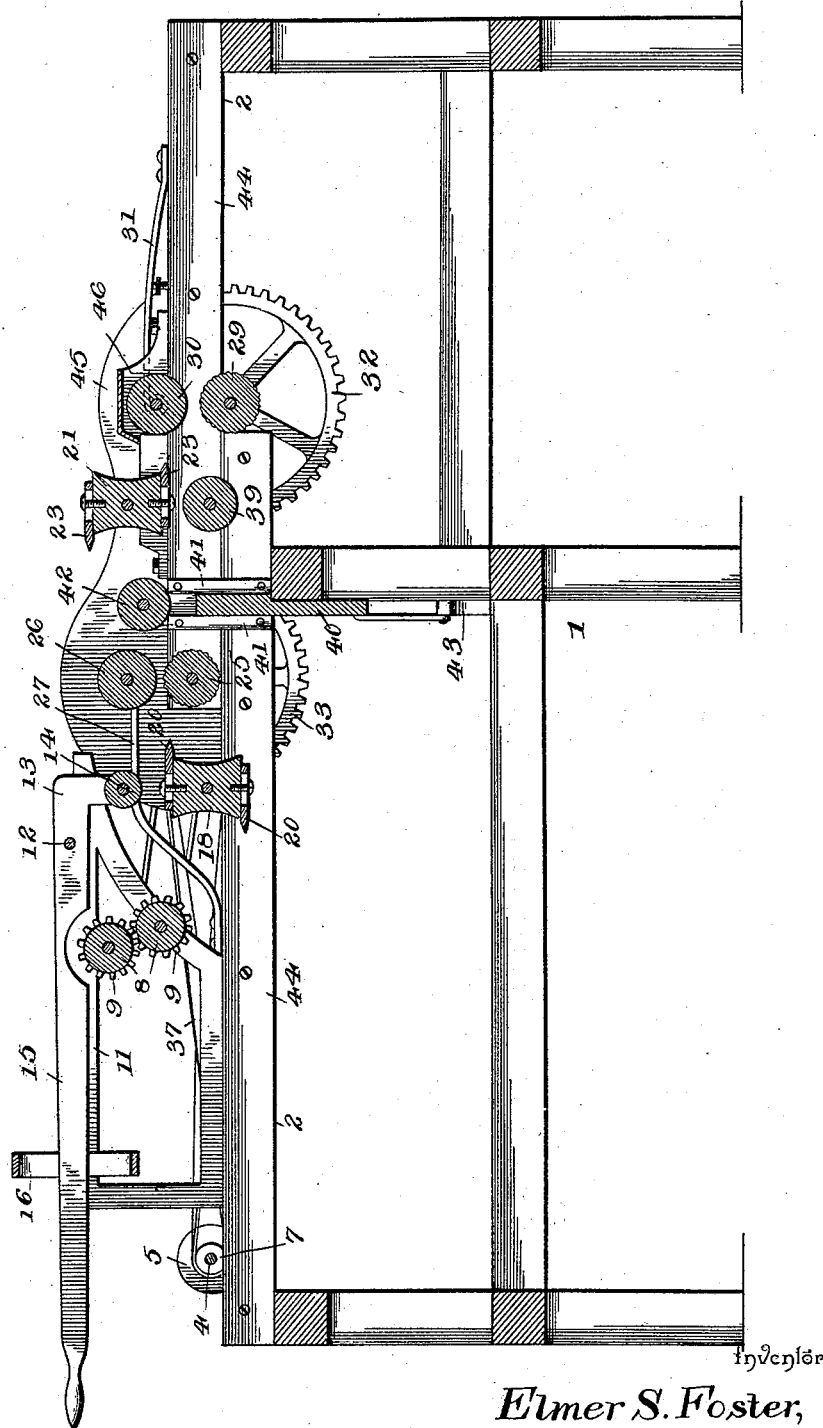
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Fig. 2.



Elmer S. Foster,

Witnesses

Chas. A. Ford.
R. M. Smith

By his Attorneys.

C. A. Snow & Co.

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Fig. 3.

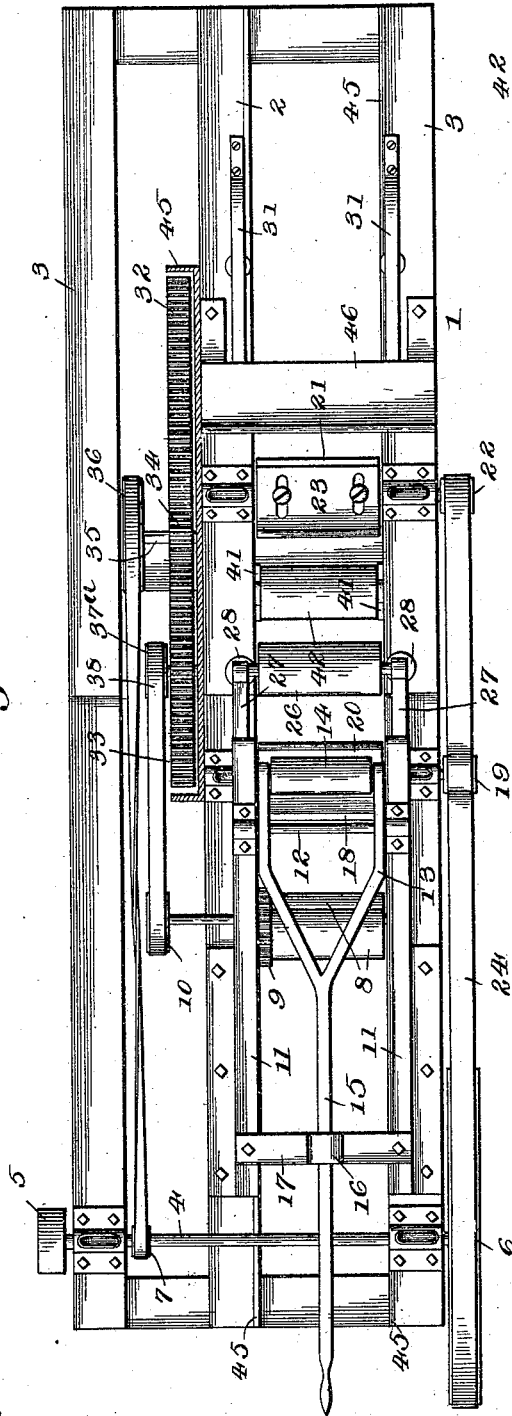


Fig. 4.

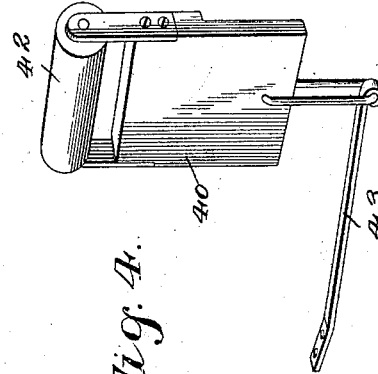
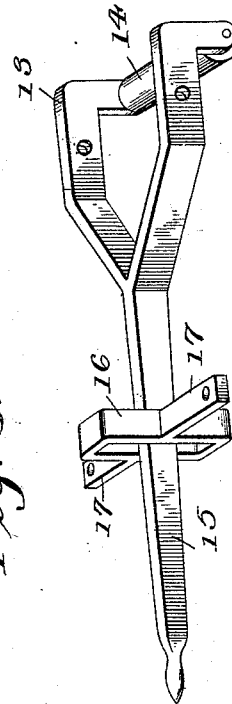


Fig. 5.



Witnesses.

Chas. A. Ford.
R. M. Smith.

By his Attorneys.

Calnow & Co.

Inventor
Elmer S. Foster,

UNITED STATES PATENT OFFICE.

ELMER S. FOSTER, OF NEW MIDDLETOWN, INDIANA.

HOOP-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 553,282, dated January 21, 1896.

Application filed May 8, 1895. Serial No. 548,588. (No model.)

To all whom it may concern:

Be it known that I, ELMER S. FOSTER, a citizen of the United States, residing at New Middletown, in the county of Harrison and State of Indiana, have invented a new and useful Hoop-Making Machine, of which the following is a specification.

This invention relates to an improvement in hoop-making machines, being designed especially for the manufacture of hoops from riven wood for use in connection with tobacco-hogsheads.

The object of the present invention is to provide a reliable and efficient machine for operating upon and dressing strips of riven wood in such manner as to shape said strips into proper form, for adapting them to be utilized as hoops designed particularly to be used for binding together the staves of tobacco-hogsheads and other articles of a similar nature.

The invention consists in certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a hoop-making machine constructed in accordance with the present invention. Fig. 2 is a vertical longitudinal section taken through the machine in line with the several feed-rolls, planer-blocks, &c. Fig. 3 is a plan view of the complete machine, with parts broken away to better illustrate the general construction and arrangement of the parts. Fig. 4 is a detail view of the sliding frame in which the self-acting spring-actuated roll is mounted, showing also the spring which actuates said roll. Fig. 5 is a detail view of the pivoted guiding frame and lever, showing also the vertically-elongated guide through which said lever operates.

Similar numerals of reference designate corresponding parts in the several figures of the drawings.

Referring to the drawings, 1 designates the main frame of the improved hoop-making machine, said frame being formed preferably of hard wood and composed of a series of upright posts or standards connected by suitable longitudinal and transverse bars or timbers firmly held together by means of tie-bolts, as shown. The upper portion of the

frame thus constructed is provided with three longitudinally-extending frame timbers or bars extending the entire length of the machine and serving as an elevated bed or table, upon which is mounted the mechanism which will now be described. The central longitudinal bar or timber 2 is arranged in such relation to the side bars 3 that a sufficient space is left upon one side for the various feed-rolls, planer-blocks, &c., while the space on the opposite side of said central bar or timber is adapted to be occupied by the several gear-wheels, pinions, and pulleys through which and suitable belting motion is communicated to the various operative parts of the machine.

The main driving-shaft of the machine (indicated at 4) is mounted in bearings at the rear end of the frame and is provided at one end with a band-pulley 5, through which it receives motion from any suitable motor by means of an interposed belt. The main driving-shaft has upon its opposite end a large band-pulley 6, from which a belt extends around the pulleys on the shafts of the planer-blocks. The main driving-shaft is provided with another small pulley 7, from which a belt extends forward and drives the several smooth and fluted feed-rolls.

The pair of feed-rolls through which the material is fed from the machine is located near the rear end of the machine and provided with smooth cylindrical surfaces, as shown. These feed-rolls (designated by the numeral 8,) are mounted upon transverse shafts and provided at their adjacent ends with spur-gears 9, which are always in mesh and thereby drive said rolls in opposite directions, adapting them to engage both the upper and lower surface of the material fed thereto and to pass the same onward out of the machine. The lower one of these feed-rolls 8 is keyed to its shaft and said shaft is extended upon one side of the frame in which it is journaled where it is provided with a band-pulley 10, through which it receives motion. In order to support the feed-rolls 8 at the proper elevation, so as to bring them into horizontal line with the other feed-rolls of the machine, an oppositely-disposed pair of bearing-blocks 11 is mounted upon the longitudinal timbers 2 and 3, extending upwardly therefrom and extending sufficiently toward the front of the machine to receive the shafts of said feed-rolls 8.

The upwardly-extending bearing-blocks 11 are further provided with bearings for the reception of a transverse shaft 12, upon which is pivotally mounted a forked or bifurcated frame 13, carrying at its front end a guiding-roll 14 revolubly mounted between the oppositely-disposed arms of said forked frame and located immediately above or in vertical line with the lower and rear planer-block. Extending rearwardly from said pivoted guide-roller frame is an operating-lever 15, arranged within convenient reach of the machine attendant. In order to support said operating-lever and guide the movements thereof, a vertically elongated or slotted frame 16 is provided, said frame having laterally-projecting arms or extensions 17, by means of which it is attached to the upper edges of the bearing-blocks 11.

18 designates the rear and lower planer-block, which is keyed to a transverse shaft mounted in bearings upon the longitudinal frame-bars 2 and 3 and provided at one end outside of the frame and in line with the large pulley 6 with a band-pulley 18, by means of which the planer-block is driven. The planer-block 18 is provided upon opposite sides with the usual planing-knives, as indicated at 20, said knives being slotted and adjustable by means of set-screws in the usual manner. A similar planer-block 21 is located in front of the block 18 and in a higher plane, being also keyed to a transverse shaft, upon one end of which is mounted a pulley 22 by which said planer-block is driven. The planer-block 21 is also provided with slotted and adjustable planing-knives 23. A suitable guiding-belt 24 extends around the large driving-pulley 6, thence over the pulley 19 on the shaft of the lower planer-block, after which it passes over and around the pulley 22 on the shaft of the upper planer-block, 21. Motion is thus imparted to the upper and lower planer-blocks and said motion is necessarily rapid owing to the relative sizes of the pulleys described.

Located intermediate the planer-blocks just described is a pair of feed-rolls, the lower one of which is provided with longitudinal corrugations and is mounted upon a transverse shaft journaled in the machine-frame. This fluted or corrugated roll 25 is located in about the same horizontal plane with the lower feed-roll, 8, above described. Located immediately above said feed-roll 25 is a smooth feed-roll 26 which is pivotally mounted in the free ends of an oppositely-disposed pair of spring-arms 27, secured to the longitudinal bars 2 and 3 upon the upper faces thereof. The tension of said spring-arms is exerted to force said smooth feed-roll 26 toward the fluted or corrugated roll and the distance between the two rolls may be regulated by means of set-screws 28, arranged with their upper ends beneath said spring-arms and engaging threaded sockets in the machine-frame. The fluted and smooth feed-rolls just described constitute the main

feed-rolls of the machine, being adapted to grasp the strips of riven wood after they have been acted upon by the upper planer-block and to force the same onward over the lower planer-block.

29 and 30 represent a pair of feed-rolls mounted in bearings near the front end of the machine. The lower one of these feed-rolls, 29, is fluted or corrugated and the upper one is smooth and journaled in the free ends of an oppositely-disposed pair of spring-arms 31, as shown, whereby the upper smooth feed-roll, 30, is normally held in contact with the upper faces or edges of the strips of wood for assisting in feeding the same to the operation of the knives.

The shaft upon which the lower fluted feed-roll 29 is keyed is extended through its bearing in and beneath the longitudinal frame-bar 2 and is provided outside of said longitudinal bar with a spur gear-wheel 32. The shaft to which the lower feed-roll 25 is keyed is also extended in a similar manner beyond its bearing in the central longitudinal frame-bar and is provided with a spur gear-wheel 33 in line longitudinally with the gear 32. A gear-pinion 34 is mounted upon a short transverse shaft 35 intermediate the gears 32 and 33, said intermediate pinion 34 intermeshing with and communicating motion to both of said spur gear-wheels 32 and 33. Mounted upon the same shaft with the spur-pinion 34 and keyed thereto is a band-pulley 36, from which a suitable belt 37 extends to and passes around the pulley 7 on the main driving-shaft 4 of the machine. Motion is thus communicated directly from the main driving-shaft to the shafts of the feed-rolls through the pinion 34 and gears 32 and 33, mounted on the shafts of said feed-rolls.

The rear spur gear-wheel, 33, has a pulley 37^a fixedly connected therewith or keyed to the shaft on which said gear-wheel is mounted, and from said pulley a band 38 extends to and passes around the pulley 10 on the shaft of the lower feed-roll, 8, at the front end of the machine. Motion is thus communicated from the main fluted feed-roll 25 to the rear pair of feed-rolls, 8. Mounted upon the shaft of the spur-pinion 34 is a guiding and supporting roll 39, located immediately beneath the upper and front planer-block 21, by means of which the strips of wood passing through the machine are upheld at just the point where they are acted upon by the upper planer-block.

40 designates a sliding block or frame the width of which is approximately equal to the distance between the longitudinal frame-bars 2 and 3, between which the feed-rolls are mounted. Said block 40 is adapted to slide vertically between two oppositely-disposed pairs of cleats or strips 41 attached to the inner adjacent faces of said longitudinal frame-bars. At the upper end said sliding block is provided with an oppositely-disposed pair of upwardly-extending arms, which are secured

at their lower ends to said blocks and adapted to receive between their upper ends an idler-roll 42, mounted loosely and adapted to revolve freely thereon. The lower end of said sliding block is provided with a pendent link or similar connection, which is connected to the inner free end of a spring-arm 43 secured to the frame of the machine at any convenient point. By means of the construction just described the roller 42 is held by spring-pressure against the upper faces or edges of the strips of wood just as they pass from the upper planer-block, thereby serving to direct said strips properly to the action of the rear planer-block.

In order to prevent the strips of wood from wearing away, the inner faces of the longitudinal frame-bars 2 and 3, between which they travel, are preferably lined or faced with metal plates or straps 44, which may be renewed from time to time whenever necessary. A suitable guard or fender 45 extends over and upon the inside of the gear-wheels 32 and 33 and the pinion 34, for the purpose of preventing the dust and shavings from getting into and between the teeth of the wheels, thereby clogging the same and rendering the machine inoperative. Said guard or fender is preferably made from sheet metal and is held in place by means of a thumb-screw passing through a perforation therein and engaging the frame of the machine. An additional guard or fender 46 is secured to the machine-frame just above the upper front feed-roll 30 and close up to but in front of the upper planer-block 21, the object of such arrangement being to catch the shavings and prevent their too-forcible ejection from the machine.

The operation of the machine will be understood from the foregoing description, and it is therefore not necessary to enter into a detailed description of such operation. It may be stated, however, that the strips of wood or material to be operated upon are first inserted between the forward pair of feed-rolls, being thereby carried inward and subjected to the action of the upper planer-block. The material is then operated upon by the vertically-movable spring-actuated idler-roll 42, by means of which said material is properly directed between the main feed-rolls 25 and 26 and thence to the action of the lower rear planer-block, against which the material is forced with any desired pressure by vibrating the frame 15 and depressing the roller 14, whereby the material is properly pointed and its thickness regulated. The material having now been operated upon on both sides is fed from the machine by means of the feed-rolls 8 and 9, located in rear of the lower planer-block.

The machine above described, while being designed especially for preparing riven wood for the purpose of making hoops for use in connection with tobacco-hogsheads, is also adapted to be used for planing or dressing

narrow strips or boards upon both sides in a single passage through the machine, for any purpose whatever.

The machine will be found reliable and efficient in operation, durable and labor-saving in practice and thoroughly efficient and practicable for the purpose for which it is designed.

Various changes in the form, proportion and minor details of construction and arrangement may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a hoop machine, a horizontal frame comprising several sets of longitudinal timbers arranged in parallelism and forming separate longitudinal spaces in which the operative parts of the machine may be mounted, the timbers of each set being arranged in different vertical planes and overlapping each other at their contiguous ends, in combination with a pair of horizontally disposed planer blocks, one mounted in bearings upon the lower longitudinal bars of each set, and another planer block mounted in bearings upon the other bars of each set, whereby said planer blocks are located in different horizontal planes and spaced apart longitudinally, a positively driven fluted feed roll mounted in bearings in the machine frame and located intermediate the planer blocks, another feed roll superposed above the aforesaid feed roll, a pair of spring arms secured rigidly at one end to the machine frame and having the superposed feed roll journaled in their free ends, and adjustable set screws having a threaded connection with the machine frame and underlying and upholding said spring arms, whereby the distance between said feed rolls may be regulated, as specified.

2. In a hoop machine, a horizontal frame comprising longitudinal timbers arranged in parallelism, in combination with a horizontally disposed planer head journaled in bearings upon and operating between said timbers, a bifurcated frame pivoted at a point intermediate its ends on the machine frame, a roller loosely journaled between the forked arms of said frame and upheld normally above and at a distance from the planer head, a lever forming a rigid extension of said bifurcated frame, and a vertically slotted cruciform guide bracket embracing said lever and having its lateral arms secured to the spaced longitudinal bars of the machine frame, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ELMER S. FOSTER.

Witnesses:

OTTO CUNNINGHAM,
JAMES A. WATSON.