

(No Model.)

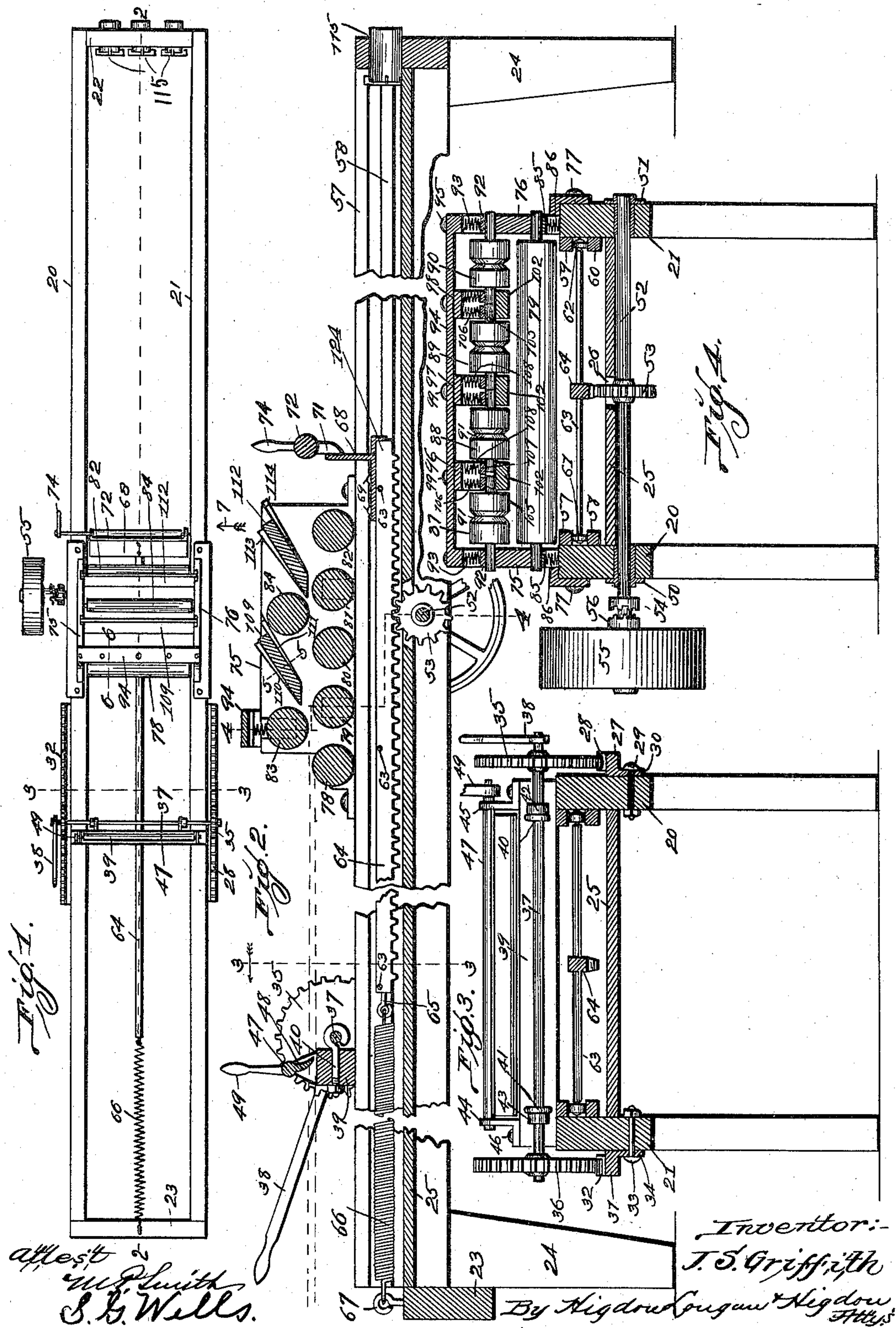
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HOOP POLE SPLITTING AND SHAVING MACHINE.

No. 584,683.

Patented June 15, 1897.



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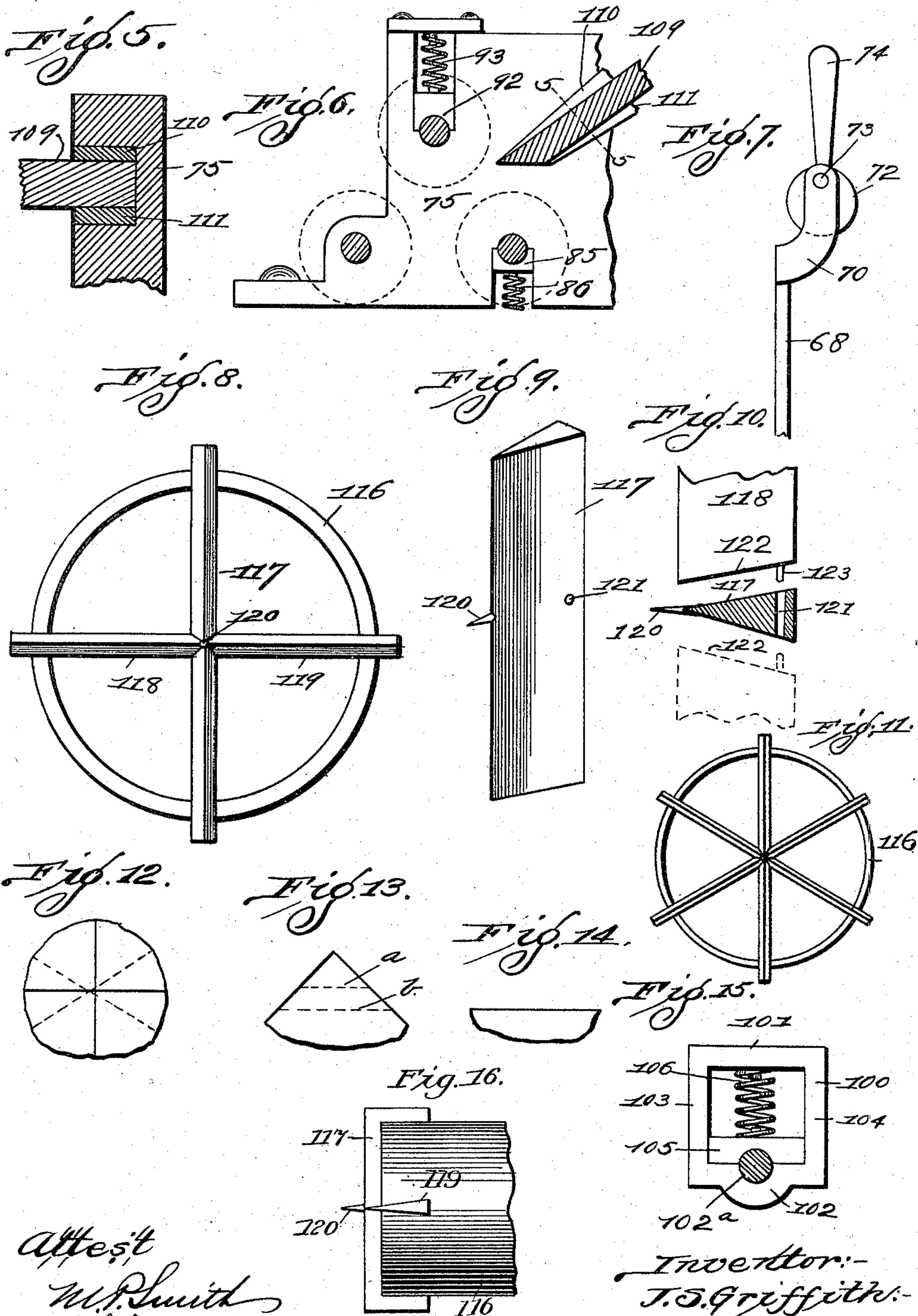
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Attest
M. P. Smith
S. G. Wells.

Inventor:-
J. S. Griffiths.

By Higdon Longan & Higdon
attys.

UNITED STATES PATENT OFFICE.

JOSEPH S. GRIFFITH, OF SIMPSON, ILLINOIS.

HOOP-POLE SPLITTING AND SHAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,683, dated June 15, 1897.

Application filed October 17, 1896. Serial No. 609,176. (No model.)

To all whom it may concern.

Be it known that I, JOSEPH S. GRIFFITH, of the city of Simpson, Johnson county, State of Illinois, have invented certain new and useful Improvements in Hoop-Pole Splitting and Shaving Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to hoop-pole splitting and shaving machines; and it consists in the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a top plan view of my improved hoop-pole splitting and shaving machine. Fig. 2 is a vertical longitudinal sectional view taken approximately on the line 2 2 of Fig. 1, upon an enlarged scale, parts being broken away to economize space. Fig. 3 is a transverse vertical sectional view taken approximately on the indicated line 3 3 of Figs. 1 and 2 and looking in the direction indicated by the arrows. Fig. 4 is a transverse vertical sectional view taken approximately on the line 4 4 of Fig. 2. Fig. 5 is a detail sectional view taken approximately on the indicated line 5 5 of Figs. 2 and 6. Fig. 6 is an enlarged detail view taken approximately on the line 6 6 of Fig. 1. Fig. 7 is a side elevation, upon an enlarged scale, of the part seen looking in the direction indicated by the arrow 7 in Fig. 1. Fig. 8 is an end view of the splitting-knives of which I make use for separating the hoop-pole into four parts. Fig. 9 is a view in perspective of one of the knives shown in Fig. 8. Fig. 10 is a detail view illustrating the construction shown in Fig. 8. Fig. 11 is an end view of the splitting device, similar to the view shown in Fig. 8, for separating the hoop-pole into six parts. Fig. 12 is a transverse sectional view of the hoop-pole and showing in full lines how the hoop-pole is divided by the device shown in Fig. 8 and in dotted lines how the hoop-pole is divided by the device shown in Fig. 11. Fig. 13 is a transverse sectional view of one of the divisions of a hoop-pole, the horizontal lines indicating the shavings which will be taken off by my improved machine. Fig. 14 is a transverse sectional view of the hoop-pole after it has been shaved by my machine. Fig. 15 is

an end view of a bearing-hanger of which I make use. Fig. 16 is a side elevation of the parts shown in Fig. 8.

In the construction of my improved hoop-pole splitting and shaving machine I employ a frame consisting of the side pieces 20 and 21 and the end pieces 22 and 23, framing the ends of said side pieces together, and the frame thus constructed is supported by suitable legs 24. The bottom 25 is inserted in the space between the side and end pieces and has an opening 26 formed approximately in its center. A bar 27 has the teeth 28 projecting from its upper surface, thus forming a toothed rack, and said bar is attached to the outer side of the side piece 21 by means of the bolts 29, which bolts pass through the flange 30 and through said side piece. The flange 30 projects downwardly from the lower surface and the inner edge of the bar 27. A bar 31 has the teeth 32 projecting from its upper surface and is attached to the outer face of the side piece 20 by means of the bolts 33 passing through the flange 34 and through said side piece 20. The bars 27 and 31 are essentially alike in construction and are mounted in horizontal and transverse alinement with each other, thus forming toothed racks, and said toothed racks are near the rear end of the machine.

The spur-gears 35 and 36 are mounted above the racks 27 and 31, respectively, and with their teeth meshing with the teeth 28 and 32 of said racks, and said spur-gears are connected by being rigidly attached to the shaft 37, and said gears are operated and travel back and forth upon the said racks by means of the hand-lever 38, which is rigidly fixed to the end of the shaft 37, outside of the gear 36.

Mounted transversely of the machine and resting upon the upper edges of the side pieces 20 and 21 is a timber 39, which is substantially square in cross-section. The eye-bolts 40 and 41 have the shafts 37 inserted through their eyes, and the screw-threaded ends of said bolts are inserted horizontally through the timber 39 and are held in position by suitable nuts. The collars 42 and 43 are fixed upon the shaft 37, one upon the outside of each of the bolts 40 and 41, and said collars hold the timber 39 from lateral motion relative to the

shaft 37. The timber 39 is slidingly mounted upon the side pieces, and said timber is operated to slide back and forth upon said side pieces by the operation of the handle 38, causing the gears 35 and 36 to travel in the racks. The brackets 44 and 45 are attached to the upper side of the timber 39, one upon each end of said timber, by means of the wood-screws 46. In the upper ends of the brackets 44 and 45 are horizontal and transversely aligned bearings, in which are rotatably mounted the spindles supporting the bar 47.

The bar 47 has an edge 48, which extends forwardly and downwardly from its axis to a point a short distance above the timber 39, and a handle 49 is rigidly fixed to the end of said bar 47, outside of the bearing in the bracket 45, for operating said edge. The bearings 50 and 51 are mounted in horizontal and transverse alinement in the side pieces 20 and 21 a short distance in front of the ends of the racks 27 and 31, and a shaft 52 is mounted in said bearings. Upon the center of the shaft 52 is fixed a spur-gear 53 to be driven by said shaft, and upon the end of the shaft 52, outside of said side piece 20, is a toothed clutch 54, rigidly fixed to said shaft. The spur-gear 53 operates in the opening 26 of the bottom 25. A driving-pulley 55 is loosely mounted upon the end of the shaft 52 and carries upon its hub the clutch 56, the teeth of which intermesh with the teeth upon the clutch 54 and drive said clutch, thus driving the shaft 52. The pulley 55 is mounted for lateral motion upon the shaft 52, and the clutches 54 and 56 may be thrown into and out of engagement with each other by operating the pulley 55 sidewise or in any suitable manner.

Mounted upon and fixed to the inner face of the side piece 20 and near the upper edge thereof and above the bottom 25 are the parallel strips 57 and 58, and upon the inner face of the side piece 21 are the parallel strips 59 and 60, the pulleys 61 operating in the space between the strips 57 and 58 and the pulleys 62 operating in the space between the strips 59 and 60, and said pulleys are connected by the bars 63, upon the ends of which said pulleys are rotatably mounted. A toothed rack 64 is mounted upon the bars 63 in a position parallel with the side pieces 20 and 21 and approximately half-way between said side pieces and with its teeth projecting downwardly and meshing with the teeth upon the spur-gear 53, as required to drive said rack 64 backwardly and forwardly by the rotation of the shaft 52.

Attached to the rear end of the toothed rack 64 is a hook 65, and a retractile coil-spring 66 is attached at its front end to said hook. A hook 67 is fixed to the upper edge of the end piece 23, and the rear end of said spring 66 is attached to said hook 67. The tension of the coil-spring 66 is exerted to draw the toothed rack 64 backwardly.

An angle-bar 68 is mounted transversely

upon the upper side and at the front end of the toothed rack 64 and is secured in position by means of the bolts or rivets 69 in such a way that one web of said bar occupies a vertical position. The ears 70 and 71 are formed integral with the ends of the vertical web of the angle-bar 68 and are turned forwardly and upwardly from the upper edge of said web and have horizontal and transversely-aligned bearings in their upper ends, in which is pivotally mounted the eccentric 72. The eccentric 72 consists of the cylindrical body, the periphery of which is eccentric to its spindle 73, and the handle 74 is fixed to the outer end of the spindle 73, which is above the side piece 20, for operating said eccentric.

A bracket 75 is mounted upon and fixed to the side piece 20 above the shaft 52, and a similar bracket 76 is mounted upon and fixed to the side piece 21 in alinement with said bracket 75. The brackets 75 and 76 are held in position by means of the wood-screws 77. Mounted in bearings in the brackets 75 and 76 and in parallel positions transversely of the machine are the rollers 78, 79, 80, 81, 82, 83, and 84. The rollers 78, 79, 80, 81, and 82 are in the same horizontal plane, and the rollers 83 and 84 are in a plane slightly above the said rollers 78, 79, 80, 81, and 82. The rollers 79 and 81 are mounted in bearings 85, which slide up and down in the brackets, and said bearings are normally held up by the coil-springs 86. The rollers 78, 80, 82, and 84 are mounted in rigid or fixed bearings in said brackets.

The roller 83 consists of the portions 87, 88, 89, and 90, which are essentially alike and are mounted end to end. Each of the portions comprising the roller 83 consists of the cylinder, having an annular V-shaped groove 91 in its center and spindles projecting from its ends. Each of the portions comprising the roller 83 is mounted to operate independently of each of the other portions. The portion which is adjacent the bracket 75 has its outside spindle mounted in the bearing 92, which slides up and down in the bracket 75 and is held normally in position by the expansive coil-spring 93. The portion which is adjacent the bracket 76 has its outer spindle mounted in a bearing similar to the bearing 92, and said bearing is held in position by a coil-spring similar to the coil-spring 93. A bar 94 is mounted transversely of the machine and is attached to the brackets 75 and 76, above the bearings 92, by means of the lag-screws 95.

The bearing-hangers 96, 97, and 98 are attached to said bar 94 by means of the lag-screws 99. The hangers 96, 97, and 98 are essentially alike and consist of the frames 100. (Shown in Fig. 15.)

The horizontal upper portion 101 of the frame fits against the under side of the bar 94 and has screw-threaded apertures to receive the lag-screws 99. The lower portion 102 of the frame has a semicircular recess

102^a in its upper side, which recess forms the lower half of the bearing, and the portions 101 and 102 are connected by the vertical portions 103 and 104. The spindles which
 5 operate in the recess in the upper face of the portion 102 are less than one-half as long as the recess. In other words, the spindle on the inner end of the portion 87 of the roller extends into and operates within one end of
 10 said recess 102^a of the hanger 96, and the spindle on the rear end of the portion 88 of the roller extends into and operates within the end of said recess 102^a, opposite the end in which the other spindle operates. In the
 15 same way the meeting ends of the spindles on the portions 88 and 89 operate in the hanger 97, and the meeting ends of the spindles upon the portions 88 and 89 operate in the recess 102^a of the hanger 97, and the meeting ends
 20 of the spindle upon the portions 89 and 90 operate in the hanger 98. Above the spindle on the inner end of the portion 87 is a plate 105, having a semicircular recess in its lower face and forming the upper half of a
 25 bearing for said spindle, and a coil-spring 106 is interposed between said plate and the horizontal portion 101 of the frame, thus giving a yielding downward pressure to the spindle. A plate 107, similar to the plate 105, is
 30 placed above the spindle on the rear end of the portion 88, and a coil-spring 108, similar to the spring 106, is placed upon said plate. Each of the hangers 96, 97, and 98 is provided with the plates 105 and 107 and the springs
 35 106 and 108, thus forming two yielding bearings in each hanger.

Between the rollers 83 and 84 is mounted a knife 109, with its edge directly back of the lower part of the roller 83. The knife 109 is
 40 mounted with its ends in slots formed upon the inner faces of the brackets 75 and 76 and is held adjustably in position in said slots by means of the wedges 110 and 111. By changing the position of the wedges the edge of the
 45 knife may be raised and lowered and its angle may be changed, as desired.

A knife 112, similar in every respect to the knife 109, is mounted behind the roller 84, and said knife is held adjustably in position by
 50 means of the wedges 113 and 114. The edge of the knife 112 is somewhat lower than the edge of the knife 109.

The hoop-pole splitters 115 are mounted horizontally in the end piece 22 and above the
 55 bottom 25 and in position parallel of the machine. The splitters 115 each consists of a hollow cylinder 116, and said cylinder has dovetailed slots cut in its rear end, in which dovetailed slots are mounted the knives 117,
 60 118, and 119. The knife 117 is somewhat longer than the diameter of the cylinder 116 and extends entirely across the rear end of said cylinder and fits tightly within the dovetailed slots within said rear end. The knives
 65 used in constructing the splitters are driven endwise into the dovetailed slots. In the center of the knife 117 and projecting backwardly

from its edge is a point 120, designed to follow the pith of the hoop-pole. An opening
 70 121 is formed through the knife 117 near its thick edge and directly in front of the point 120. The inner end edges 122 of the knives 118 and 119 are beveled to fit the beveled side
 75 faces of the knife 117, and pins 123 project from said end edges into the opening 121. The knives 118 and 119 only extend to opposite sides of the knife 117, and the inner ends
 80 of said knives 118 and 119 are supported by the pins 123, engaging in the opening 121. The splitting devices thus constructed, and as shown in Fig. 8, will split a hoop-pole into
 85 four pieces. On the same principle the device may be constructed, as shown in Fig. 11, to split a hoop-pole into six pieces, or it may be so constructed as to split a hoop-pole into
 three pieces or into any other desired number of pieces.

In the operation of my improved hoop-pole splitting and shaving machine the hoop-poles are laid upon the bottom 25 in front of the
 90 toothed rack 64 and one hoop-pole is placed in each of the splitters 115, with the point 120 in its heart or pith. Before being placed upon the point 120 it is better to cut the end of the
 95 hoop-poles square off with a saw or in any other suitable way. The bar 124 is attached to the front end of the toothed rack 64 and extends entirely across the bottom 25 and inside of the
 100 side pieces 20 and 21. After the hoop-poles have been placed in position with their front ends in the splitters 115 the operator throws the belt-wheel 55 over until the clutch connects said belt-wheel and the shaft 52, and
 105 then the toothed rack 64 is driven forwardly by the spur-gear 53, thus carrying the bar 124 forwardly against the butt-ends of the hoop-poles and pushing said hoop-poles through the
 110 splitters 115. When the bar 124 has been carried nearly to the knives upon the splitters 115, the belt-wheel 55 is thrown back, thus disconnecting the clutch from the shaft, and the coil-spring 66 withdraws the toothed rack 64 to its
 115 normal position. The hoop-poles which have been thus split into four or six pieces are then carried to the rear end of the machine and are placed under the edge 48 and upon the timber
 120 39, with their front ends resting upon the roller 78. They are then pushed forwardly until their front ends pass under the roller 83. In placing the pieces in position upon the timber 39 the bark side is placed downwardly and the heart edge is placed in the
 125 grooves 91. Then the operator engages the handle 49 and presses it forwardly, thus depressing the edge 48 of the bar 47 into the edge of the hoop-pole. The operator then engages the handle 38 and swings upwardly and forwardly, thus causing the gears 35 and
 130 36 to travel forwardly in the toothed racks 27 and 31 and sliding the timber 39 forwardly upon the side pieces 20 and 21. As the timber slides forwardly the pieces of hoop-poles are pushed between the roller 79 and the knife 109, and a portion of the heart of the

stick is cut away by said knife, approximately as indicated by the line *a* in Fig. 13. The front end of the hoop-pole then passes under the roller 84, over the roller 81, and another shaving is taken from the heart side of the stick, cutting it approximately to the line *b* in Fig. 13. The finished end of the stick then passes over the roller 82 and over the upper edge of the vertical web of the angle-bar 68 and under the eccentric 72. The operator then engages the handle 74, operating the eccentric 72, and presses it forwardly, thus pinching the stick between said eccentric and the upper end of said angle-bar. The operator then throws the machine into gear by moving the belt-wheel 55 upon the shaft 52. The toothed rack 64 is then driven forwardly by the operation of the shaft 52, and the hoops are drawn through the machine by the eccentric 72 engaging the angle-bar 68. After the hoop has been drawn out of the machine the operator throws the machine out of gear, the spring 66 withdraws the toothed rack 64, and the operator swings the lever 38 backwardly and the machine is ready to repeat the operation just described. By placing the hoop-poles in the splitters 115 and by placing the split pieces of said hoop-poles upon the timber 39 both at the same time the machine splits and shaves simultaneously. In shaving the hoops, if the knife strikes a knot the roller 79 or 81, as the case may be, will give, and thus prevent the machine from clogging and breaking the hoops.

I claim—

1. In a hoop-pole splitting and shaving machine, a splitter consisting of a hollow cylinder, knives arranged radially from the center of said cylinder, a point projecting from the axial center of said cylinder and in front of said knives, and means of forcing the hoop-pole through said cylinder, substantially as specified.

2. In a device of the class described, a suitable table, a series of splitters mounted above said table; each of said splitters consisting of a hollow cylinder, knives arranged radially from the center of said cylinder, a point projecting from the axial center of said cylinder and in front of said knives; and a reciprocating bar operating to and from said splitters and above said table, substantially as specified.

3. In a device of the class described, a suitable table, splitters mounted above said table; each of said splitters consisting of a hollow cylinder, knives arranged radially from the center of said cylinder, a point projecting from the axial center of said cylinder and in front of said knives; a bar mounted transversely of said table, a toothed rack mounted above said table and carrying said bar, and a rotating gear meshing with said toothed rack and operating to move said bar to and from said cylinders, substantially as specified.

4. In a device of the class described, a suit-

able table, splitters mounted above said table; each of said splitters consisting of a hollow cylinder, knives arranged radially from the center of said cylinder, a point projecting from the axial center of said cylinder and in front of said knives; a bar mounted transversely of said table, a toothed rack mounted above said table and carrying said bar, a gear meshing with said toothed rack, a shaft carrying said gear, a driving-pulley loosely mounted upon said shaft, clutch mechanism connecting said pulley with said shaft for advancing said bar toward said cylinders, and means of withdrawing said bar from said cylinders, substantially as specified.

5. In a device of the class described, a suitable table, splitters mounted above said table; each of said splitters consisting of a hollow cylinder, knives arranged radially from the center of said cylinder, a point projecting from the axial center of said cylinder and in front of said knives; a bar mounted transversely of said table, a toothed rack mounted above said table and carrying said bar, a gear meshing with said toothed rack, a shaft carrying said gear, a driving-pulley loosely mounted upon said shaft, clutch mechanism connecting said pulley with said shaft for advancing said bar toward said cylinders, and a coil-spring attached to said toothed rack for withdrawing said bar from said cylinders, substantially as specified.

6. In a device of the class described, a splitter consisting of the hollow cylinder 116, the knife 117 mounted in slots in the ends of said cylinder and radially relative to the axial center of said cylinder and the point 120 projecting in front of said knife and at the axial center of said cylinder, substantially as specified.

7. In a device of the class described, a splitter consisting of the hollow cylinder 116, the knife 117 mounted in slots in the end of said cylinder and radially relative to the axial center of said cylinder, the point 120 projecting in front of said knife and at the axial center of said cylinder, and the knives 118 and 119 intersecting said knife 117, substantially as specified.

8. In a device of the class described, grooved guide-rollers yieldingly mounted end to end in a line transversely of the machine, a knife adjustably mounted behind said guide-rollers, a roller yieldingly mounted below the edge of said knife and in a position parallel with said grooved rollers, a roller rigidly mounted behind said knife, a second knife adjustably mounted behind said rigidly-mounted roller, a roller yieldingly mounted below the edge of the last-mentioned knife and means of advancing hoop-sticks between said knives and said yieldingly-mounted rollers; which means consist of a body slidingly mounted transversely of the machine and in front of said rollers, a shaft mounted transversely of said machine and adjacent and connected to said body, spur-gears upon the

ends of said shaft, toothed racks mounted longitudinally of the machine and in position to be engaged by said spur-gears, means of operating said shaft to slide said body to and from said rollers and gripping mechanism carried by said body to engage the hoop-sticks, substantially as specified.

9. In a device of the class described, grooved guide-rollers yieldingly mounted end to end in a line transversely of the machine, a knife adjustably mounted behind said guide-rollers, a roller yieldingly mounted below the edge of said knife and in a position parallel with said grooved rollers, a roller rigidly mounted behind said knife, a second knife adjustably mounted behind said rigidly-mounted roller, a roller yieldingly mounted below the edge of the last-mentioned knife, means

of pulling the hoops from said knives; which means consists of a toothed rack mounted to reciprocate longitudinally of the machine, gears meshing with said toothed rack, a shaft carrying said gears, a driving-pulley loosely mounted upon said shaft, clutch mechanism connecting said pulley with said shaft, a bar extending transversely of the machine and carried by said toothed rack, and gripping mechanism carried by said bar to engage said hoops, substantially as specified.

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

JOSEPH S. GRIFFITH.

Witnesses:

EDWARD E. LONGAN,
MAUD GRIFFIN.