(No Model.) 7 Sheets—Sheet 1.

J. M. SISSONS & W. S. MAYO

FAGOT MAKING MACHINE.

No. 458,321. Patented Aug. 25, 1891.

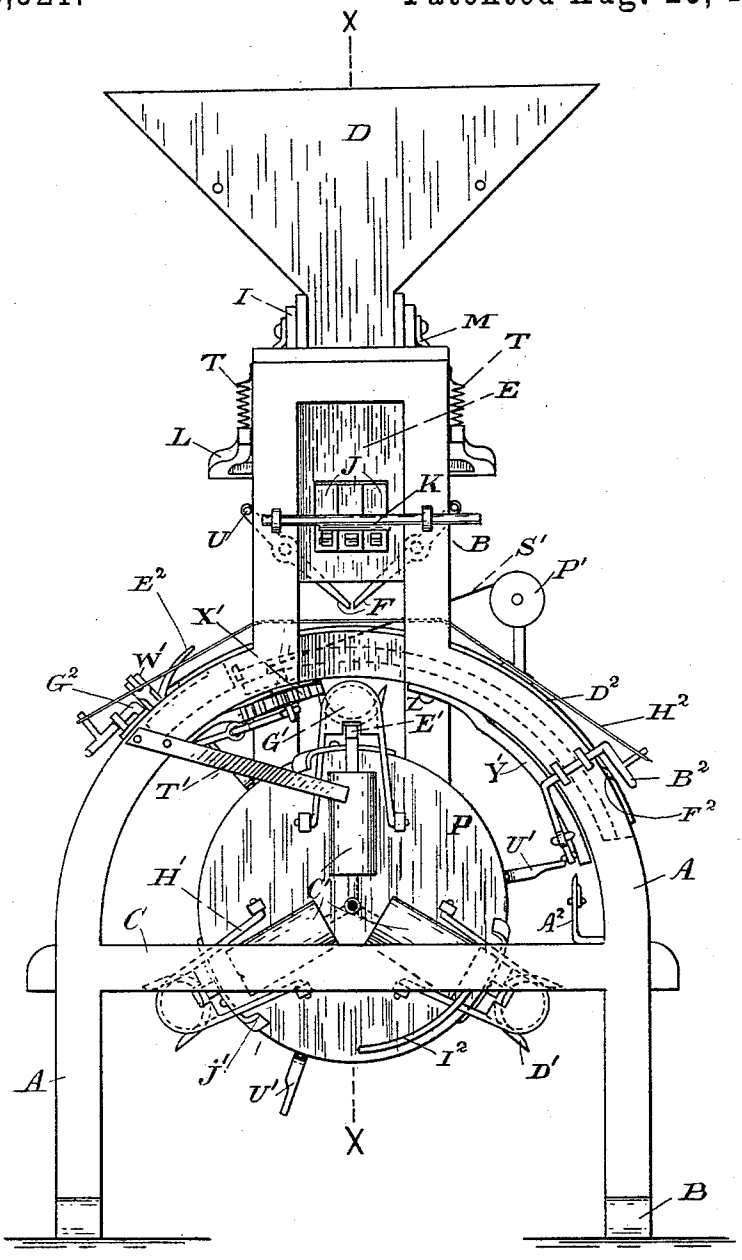


FIG. 1

WITNESSES:

F. S. Elmore

M. A. Kennedy

INVENTORS:

J. M. Sissons

W. S. Mayo

By Chas. T. Dodge atty

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J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

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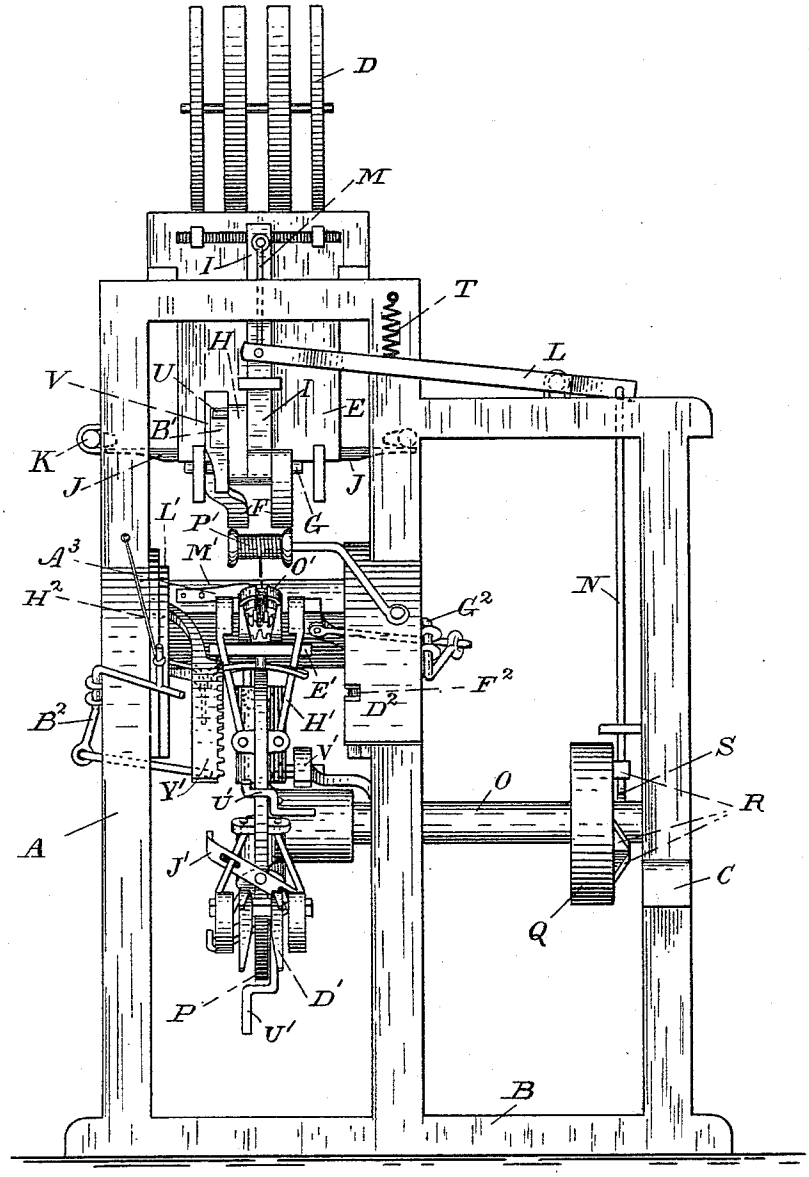


FIG. 2

WITNESSES:

P. S. Elmore

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INVENTORS:

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J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

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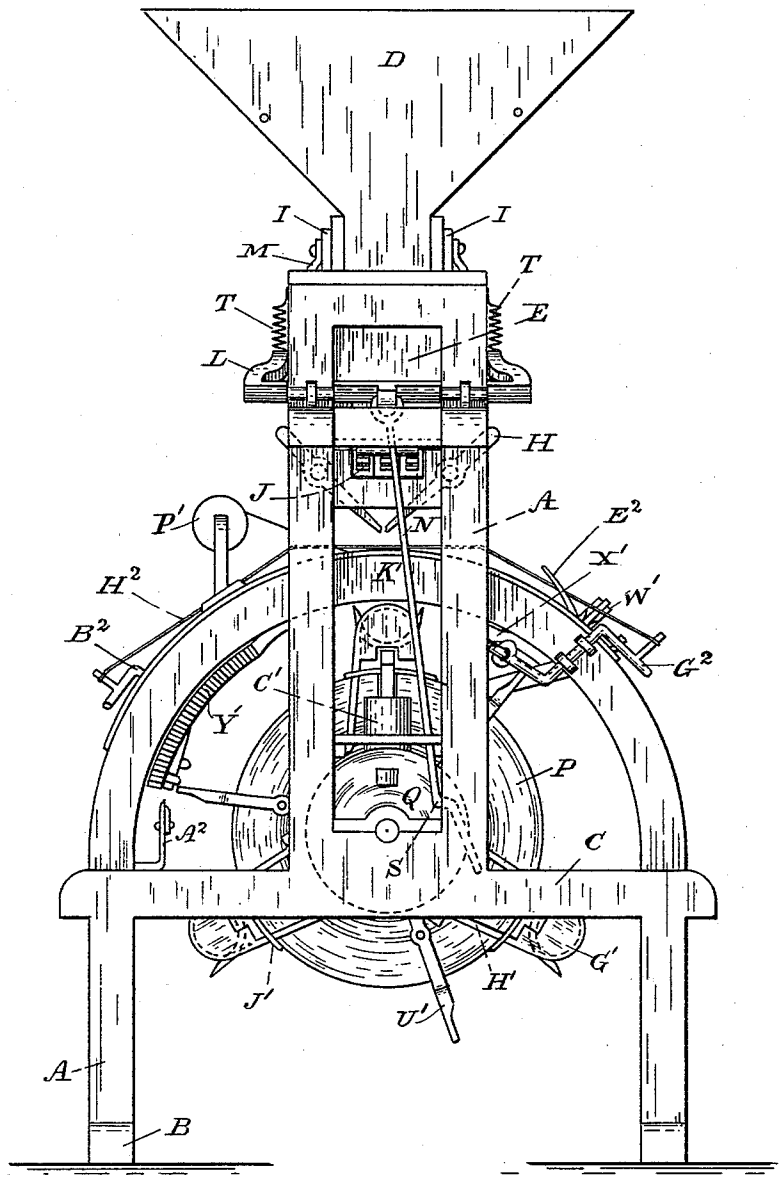


FIG. 3

WITNESSES:

F. S. Elmore

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INVENTORS:

J. M. Sissons

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J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

No. 458,321. Patented Aug. 25, 1891.

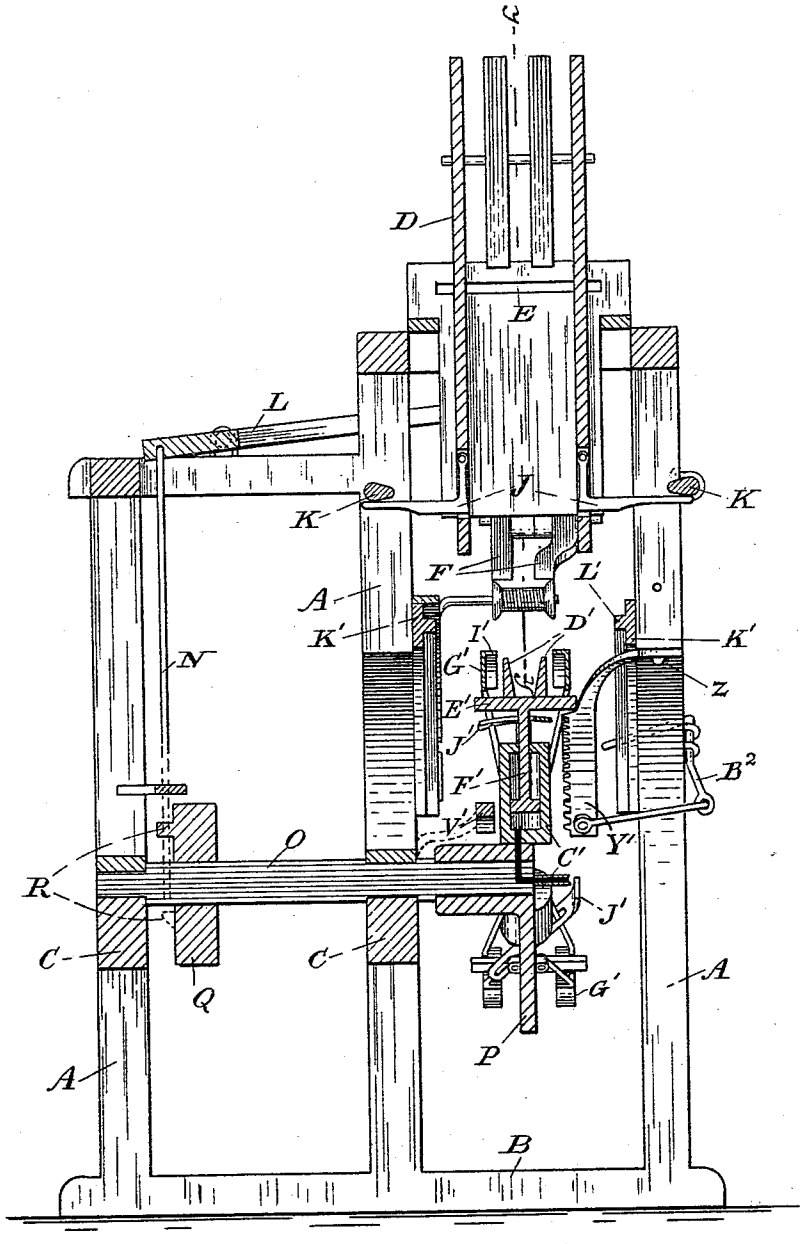


FIG. 4

WITNESSES:

F. S. Elmore

M. A. Kennedy

INVENTORS:

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W. S. Mayo

By Phil. T. Dodge Atty

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(No Model.) 7 Sheets—Sheet 5.

J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

No. 458,321. Patented Aug. 25, 1891.

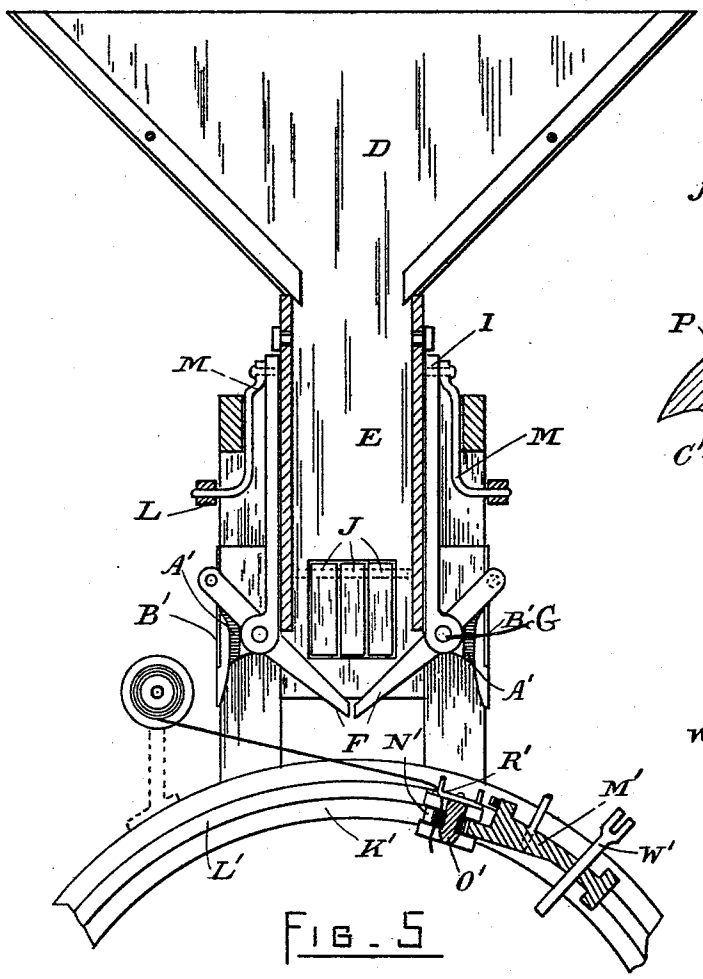


FIG. 5

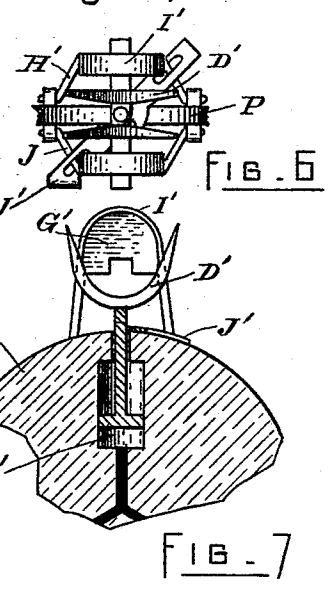


FIG. 6

FIG. 7

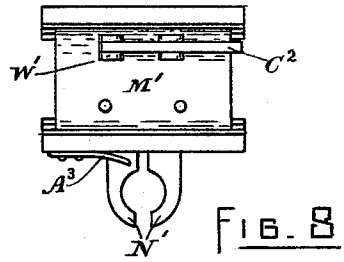


FIG. 8

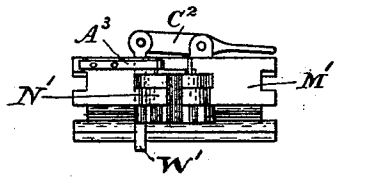


FIG. 9

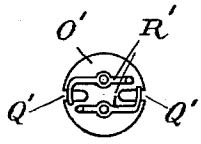


FIG. 10

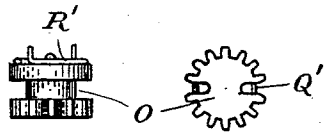


FIG. 11 FIG. 12

WITNESSES:

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J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

No. 458,321. Patented Aug. 25, 1891.

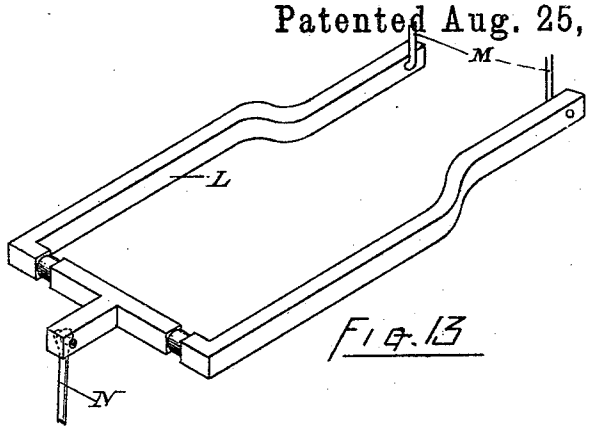


Fig. 13

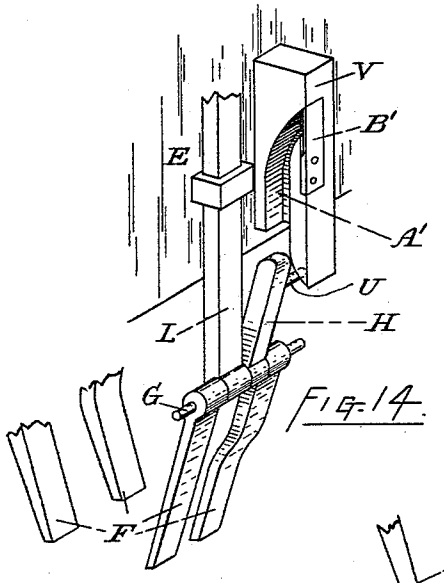


Fig. 14

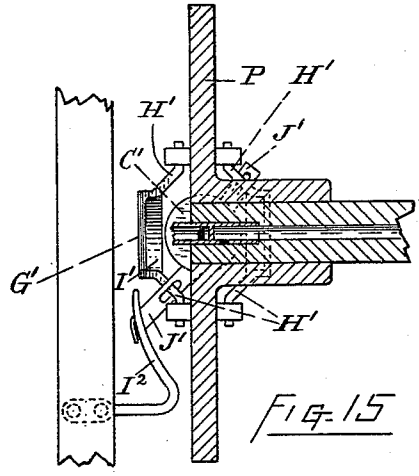


Fig. 15

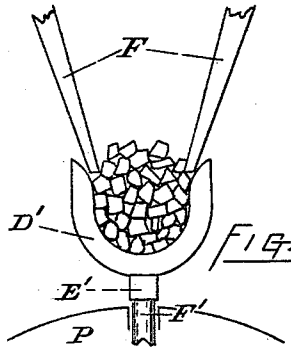


Fig. 16

Witnesses:—
Fabius S. Elmore.
W. R. Kennedy

Inventors:—
J. M. Sissons
W. S. Mayo—
By P. Y. Dodge Atty.

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(No Model.) 7 Sheets—Sheet 7.

J. M. SISSONS & W. S. MAYO.

FAGOT MAKING MACHINE.

No. 458,321. Patented Aug. 25, 1891.

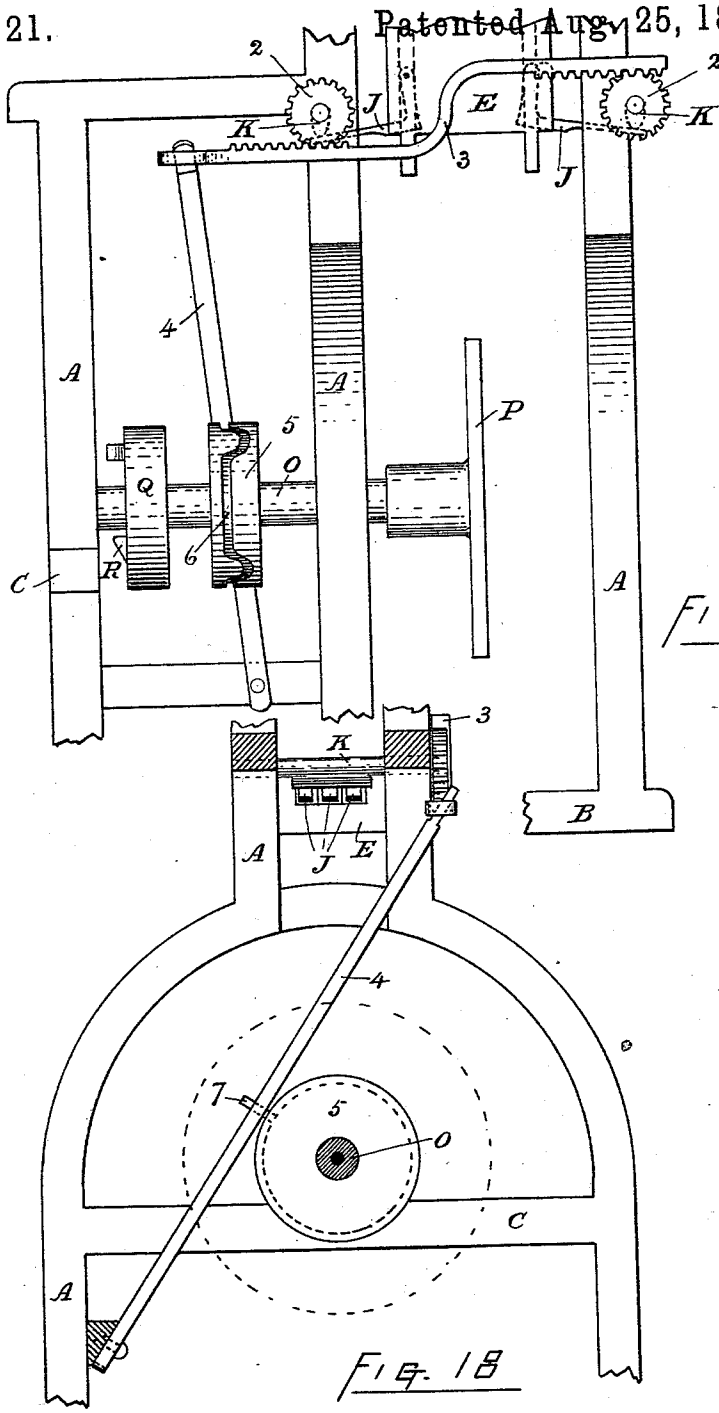


FIG. 17

FIG. 18

Witnesses:
Fabius J. Elmore.
J. G. Jones

Inventors:
J. M. Sissons
W. S. Mayo
By Phil. T. Dodge
Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JONATHAN MARKHAM SISSONS, OF HULL, AND WARREN SPEAR MAYO, OF OTTAWA, CANADA; SAID SISSONS ASSIGNOR TO GEORGE ROBERTSON, OF OTTAWA, CANADA.

FAGOT-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 458,321, dated August 25, 1891.

Application filed June 11, 1890. Serial No. 355,102. (No model.)

To all whom it may concern:

Be it known that we, JONATHAN MARKHAM SISSONS, millwright, of the city of Hull, in the county of Ottawa, Province of Quebec, and WARREN SPEAR MAYO, gentleman, of the city of Ottawa, in the county of Carleton, Province of Ontario, Canada, have invented a new and useful Improvement in Fagot-Making Machines; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to devices which are designed to perform automatically the segregating and binding together of pieces of wood into fagots or bundles convenient for handling in sale or otherwise. It is embodied in the machine which is hereinafter described and which has the following essential features—namely, a strong frame supporting all the working parts, a hopper and tube in the upper part of the frame provided with retaining and releasing arms for carrying and delivering the fagot-sticks into one or more fagot-forming devices carried by a revolving disk fixed on a horizontal shaft centrally under the hopper, a sliding head for carrying the binding-wire around the bundle and provided with mechanism for twisting or tying it, and a shear for severing the wire, all substantially as herein described, and illustrated in the annexed drawings, in which—

Figure 1 is a front view of the machine; Fig. 2, a side view; Fig. 3, a rear view; Fig. 4, a sectional elevation from front to rear on line *x x;* and Fig. 5 a part sectional view of the hopper, trunk, and sliding head on line *y y*. Fig. 6 is an end view, and Fig. 7 a transverse sectional view, of the fagot-former. Fig. 8 is a top view, and Fig. 9 a front view, of the sliding head; and Figs. 10, 11, and 12 are top, side, and lower end views of the twister. The latter seven figures are drawn to a larger scale than the previous ones. Fig. 13 is a detached view of the three-armed lever. Fig. 14 shows the device which controls the position of the arms that carry the sticks from the trunk to the cradle of the fagot-former. Fig. 15 is a section through the disk P, looking downward, showing the device for opening the end-eveners. Fig. 16 shows the arms above mentioned delivering the fagot-sticks into the cradle of the fagot-forming device. Fig. 17 is an elevation of a portion of the machine, showing the connections for operating the lever-actuating rollers. Fig. 18 is an end elevation of the same, looking in the directions indicated by the arrows.

The post A, sills B, and girts C constitute the frame-work of the machine. The sticks which are to be bound into fagots are delivered into the hopper D, in which they lie endwise across from front to rear of the hopper, filling the trunk E or downward continuation of the hopper, in which they are supported by the swinging arms F, which are rigidly attached to the rocking pins G on opposite sides of the trunk. These pins pass through and are carried by the vertical sliding bars I, which are connected with the two forward arms of the three-armed lever L by the rods M. The lever L is fulcrumed on the top of the machine-frame. Its two forward arms are held by the springs T at the height of their movement, except when periodically lowered, as hereinafter explained, to allow the arms F to deliver their load of fagot-sticks to the forming and binding mechanism. When engaged in supporting the fagot-sticks in the trunk, the arms F are held up against the bottom end of the trunk, sloping inward and meeting under its center, (see Fig. 1;) but when in the working of the machine one of the fagot-formers is brought under the trunk E the arms F are lowered with their load of sticks, until having reached a certain point, they are allowed to swing open and drop their load into the cradle of the fagot-former.

The holding and swinging of the arms F is controlled by the following device, viz: The short arms H are rigidly fixed to the rocking pins G and have in their outer ends the laterally-projecting pins U. When the sliding bars I and arms F are at the top of their stroke, the pins U lie against the outer faces of the blocks V, which are secured to the sides of the trunk. The arms F are by this means held to point inward under the hopper-trunk not only while receiving their load of fagot-sticks, but also while descending with them, until the pins U pass over the

lower ends of the blocks V, when the weight of the load upon the arms F will spread them apart, allowing the sticks to drop into the cradle of the fagot-former and at the same time throw the upper end of the arms H inward, so that by the upward movement of the sliding bar, with the arms F and H, the pins U will be drawn up through the grooves A′ in the inner faces of the blocks V. Should the weight of the sticks be found insufficient for opening the arms F, as above stated, a coil spring may be placed on the rocking pin, one of its ends secured to the sliding bar and the other to one of the arms, which will have the desired effect. The grooves A′ are curved to open outward through the faces of the blocks and their upper openings are covered by the springs B′, so that as the pins U are drawn upward they are thrown out upon the faces of the blocks, and the springs B′ close behind them and form a straight surface over which the pins U slide in their downward movement.

A device for preventing more than a sufficient number of sticks to form a fagot descending with the arms F is shown in Fig. 4, and consists in a number of holding-levers J, pivoted at their top ends in the sides of the trunk E. About midway of their length they are bent outward. (See Fig. 4.) An eccentric-roller K, journaled in suitable bearings, lies across the outer ends of these levers and close above them, so that the turning of the eccentric will at regular intervals press down these outer ends and press the angles of the levers against the sticks in the trunk which are opposite them, and thereby prevent them and the mass above them from dropping down when the sticks below them are lowered away into the fagot-former. The eccentric K may be operated by any convenient part of the mechanism.

In Figs. 17 and 18 are shown devices for operating the eccentric-rollers K, which actuate the holding-levers. These consist of a spur gear-wheel 2, carried on the overhanging end of each of the eccentric-rollers, a sliding rack 3, curved so as to overlie one of the wheels 2 and underlie the other, a lever 4, pivoted to the lower part of the machine-frame and its upper end engaging with the rack 3. The throw of the lever 4 is effected by means of a cam-wheel 5, fixed on the shaft O and having a groove 6 formed in its cylindrical surface, and a pin 7, fixed in the lever 4 and projecting into said groove. For each fagot-forming device in the machine there is a lateral deflection of this groove, as shown in Fig. 17, and in the revolution of the cam-wheel 5 as the pin 7 enters their deflections the lever 4 and rack 3 are thrown sidewise, the wheels 2 are turned, and the eccentric-rollers K are operated to hold or release the levers J, as required.

In the lower part of the machine there is a horizontal shaft O, journaled in bearings on two of the girts C. On one end of this shaft there is fixed the large disk P and on the other end the cam-wheel Q, on which are formed the lugs R. As the shaft O revolves, the lugs R come up against a shoulder S on the rod N, which is attached to the rear arm of the lever L. The rear arm is thereby raised and the two forward arms lowered, with the arms F, until the latter fall open and deposit their load of sticks in the cradle, as above mentioned.

The fagot-forming devices, of which there may be one or several in the machine—in the drawings we have shown three—are carried in the revolving disk P. Each of these consists of a steam-cylinder C′, set radially in the revolving disk P, a cradle D′, and a cross-head E′, fixed to the outer end of the piston-rod F′, end-evening plates G′, hinged to the disk P by the rods H′ and having their rims I′ turned inward, and the cross-lever J′, pivoted to the edge of the disk P and engaging with the rods H′ on both sides of the disk (see Fig. 6) in such a way that the swinging of the cross-lever on its pivot will close the plates G inward or move them apart, as required.

We will now describe the mechanism for drawing the wire around the bundle and forming the twist-tie. It will be seen in the drawings that the four posts of the front part of the machine-frame are curved inward and connected in pairs by the facing-pieces K′, forming two semicircular arches. On the inner faces of these arches there are formed the ribs L′, which serve as ways or guides, upon which a sliding head M′ (shown in Figs. 8 and 9) travels from side to side of the machine and carries the binding-wire over the bundle of sticks in the cradle. The branches N′, which project from the front edge of the sliding head, clasp the twister O′ around its grooved middle part loosely, so as to allow it to turn freely between them. A space is left between the outer ends of these branches for the purpose hereinafter explained. The twister O′ is a small cylindrical body having an annular groove cut around its middle and two grooves Q′ cut in it longitudinally from end to end on opposite sides and extending inward to near its axis. The projecting rim left below the annular groove is notched, so as to make it virtually a spur-wheel, the function of which will appear farther on. The object of the twister is the winding together of the two parts of the binding-wire where they are brought to meet around the fagot-bundle. The wire used for binding the fagots is coiled upon the spool P′, while its end is held in one of the grooves Q′ of the twister. When the arms F are in the act of depositing their load of fagot-sticks in the cradle D′, the sliding head M′ is waiting on the opposite side of the machine from the spool, and the wire extending from the spool to the head lies across the cradle, so that the bundle is laid by the arms F directly upon the wire.

The operation of this machine is substantially as follows: The eccentric-roller K is turned by its connection with the driving-power so as to swing the holding-levers J and cause their angles to grip and hold the sticks opposite and above them in the trunk E, when the sticks below them are lowered away. The turning of the shaft O brings one of the cradles D′ directly under the center of the hopper D, and at the same time causes one of the lugs on the cam-wheel Q to lift the rod N, thereby tilting the lever L and lowering the arms F, as above described, causes them to deposit their load of fagot-sticks in the cradle D′ and upon the binding-wire S′. The rotation of the disk then brings the overhanging end of the cross-lever J′ against an arm T′, fixed to the machine-frame, which swings the lever and, pressing the plates G′ closely against the ends of the sticks in the cradle, brings them even. It will then be seen that the rims I′ overhang the ends of the sticks inward. Steam is then admitted below the piston of the cylinder C′, which shoves the cradle outward and compacts the bundle of sticks against the rims I′. The short inner arm of one of the levers U′, which are pivoted on the disk P, then comes against a stationary stop V′, which throws forward the longer outer arm, which, coming against a drop-pin W′ in the sliding head, carries the sliding head, and with it the wire end in the twister, over the bundle in the cradle. It will be easily seen that by this arrangement the sliding head moves much faster than the motion of the disk P and carries the wire end ahead of the bundle in the cradle. Before the sliding head is thus started to carry the wire over the bundle the spur-wheel formed on the lower end of the twister is meshed into the short rack X′, which is pivoted to one side of the machine-frame. This engagement of the twister with the rack gives the twister a half-turn, when the sliding head is moved forward, so that when it is sent over the bundle the groove Q′, which carries the end of the wire, is turned to the rear and the empty groove in the opposite side of the twister will be presented to and receive the wire leading from the spool down under the bundle in the cradle, the space between the ends of the branches N′ allowing the wire to pass between them and into the forward groove Q′. The rotation of the disk P then brings the spur-wheel of the twister into gear with a segmental rack Y′ on the opposite side of the machine from the rack X′ and which is pivoted at Z to the machine-frame. The revolving of the twister through its engagement with this rack now brings the upturned tail of one of the lever-hooks R′ against the outer face of a spring-stop A^3, which throws its hook end in front of the wire and holds it in the groove. The movement of the twister along the rack Y′ causes it to twist together the two portions of the wire leading downward from it to and around the bundle. The sliding head then strikes against an arm of the shears A^2 (not shown in Fig. 2) and causes them to close and sever the wire close outside the twist. The sliding head then strikes an arm of the bent lever B^2, which is fulcrumed on the machine-frame and has its other end connected with the swinging end of the rack Y′. This throws the rack back out of gear with the spur-wheel of the twister. The drop-pin W′ is pivoted to one end of a lever C^2, which is fulcrumed on the sliding head, and when it is moving forward across the machine, carrying the wire over a bundle, the outer end of this lever slides upon the outside of the overhanging edge of a guide-strip D^2, which is secured to the top side of one of the semicircular arches of the frame above mentioned until after the binding-wire has been cut. Then the outer end of this lever C^2 passes under a cap E^2, which causes it to pass down through a gap in the guide-strip, and thereby draws the drop-pin W′ up from the lever U′ and allows the sliding head to be drawn back across the machine by a weight and cord or other suitable means. In the meantime onward rotation of the disk has brought the overhanging end of the cross-lever J′ against an outward inclined rod I^2, fixed to the machine-frame, and the end-eveners are thereby spread apart and the bound fagot allowed to drop from the machine. When near the end of its backward travel, the end of the lever C^2 moves up an incline through a gap F^2 in the guide-strip, thereby lowering the drop-pin to be again caught by one of the levers U′ on the disk. The sliding head then strikes an arm of the bent lever G^2, which is fulcrumed on the machine-frame, and has its other end connected with the swinging end of the rack X′, which is thereby thrown again into gear with the spur-wheel of the twister. The levers B^2 and G^2 are connected together by the wire or cord H^2, so that they move simultaneously either inward or outward.

The vertical sides of the hopper D may be made adjustable at various distances apart, so as to suit different lengths of sticks, and the sloping sides are also made movable, so that they may be vibrated by eccentrics or other suitable device.

Respecting arrangement for the admission of steam to the cylinders and its escape therefrom, we would only here say that perhaps the simplest way would be by making the shaft O hollow and leading the steam in through a pipe, as indicated in Fig. 15, in which a plug is fixed at a short distance from its end. Two openings are made in the side of the pipe, one on each side of the plug registering with similar openings in the cylinder. The openings in the pipe are made at such points in its circumference as will allow of the entrance of the steam on one side of the plug and its escape on the other side at the proper time to suit the working of the machine.

We do not claim, broadly, the use of steam in a cylinder for compressing the bundle,

curved loops for holding against the crushing force, or a revolving disk for twisting or tying the binding-wire on the fagot; but

We do claim as our invention—

1. In a fagot-making machine, the hopper D, trunk E, and holding-levers J, pivoted in the sides of said trunk, the eccentric-rollers K, and means for operating said rollers, substantially as shown and specified.

2. In a fagot-machine, the vertically-sliding bars I, carrying the rocking pins G, the arms F and H, rigidly secured to said rocking pin, and the pins U in the arms H, arranged to move on the faces of and through grooves in the blocks V, which are provided with the springs B′ for controlling the action of the arms F, substantially as shown and specified.

3. In a fagot-machine, the combination of the shaft O, journaled on the frame, the cam-wheel Q thereon, the lugs R on said cam-wheel, the rod N, arranged to be engaged by the said lugs, the lever L, having its rear end pivoted to the rod end, the bars I, the rods M, connecting the bars I to the forward ends of the lever L, the rocking pins G, sustained by the bars I, and the arms F, carried by the rocking pins, substantially as described.

4. In a fagot-machine, the shaft O, having secured on it the disk P, carrying one or more fagot-forming devices, substantially as shown and specified.

5. A fagot-forming device consisting of a steam-cylinder set radially in a revolving disk centered on a horizontal shaft, a cradle secured to the piston-rod of said cylinder for receiving the fagot-sticks from a hopper above it, and end-evening plates hinged to opposite sides of said disk, substantially as shown and specified.

6. The combination, in a fagot-machine, of a hopper and a trunk having the holding-levers J with a fagot-forming mechanism having a steam-cylinder carried in a revolving disk, a cradle on the piston-rod of said cylinder, and end-evening plates hinged to said disk, substantially as shown and specified.

7. The combination of a fagot-forming mechanism composed of a steam-cylinder carried in a revolving disk, a cradle on the piston-rod of said cylinder, and evening-plates hinged to opposite sides of said disk, with a sliding head moving on guides for carrying a binding-wire over the fagot and provided with a twister for securing the wire around the fagot, substantially as herein shown and described.

Signed this 31st day of March, 1890.

JONATHAN MARKHAM SISSONS.
WARREN SPEAR MAYO.

In presence of—

JAMES BRUCE SPENCE,
ROBERT HARVEY BROCK.