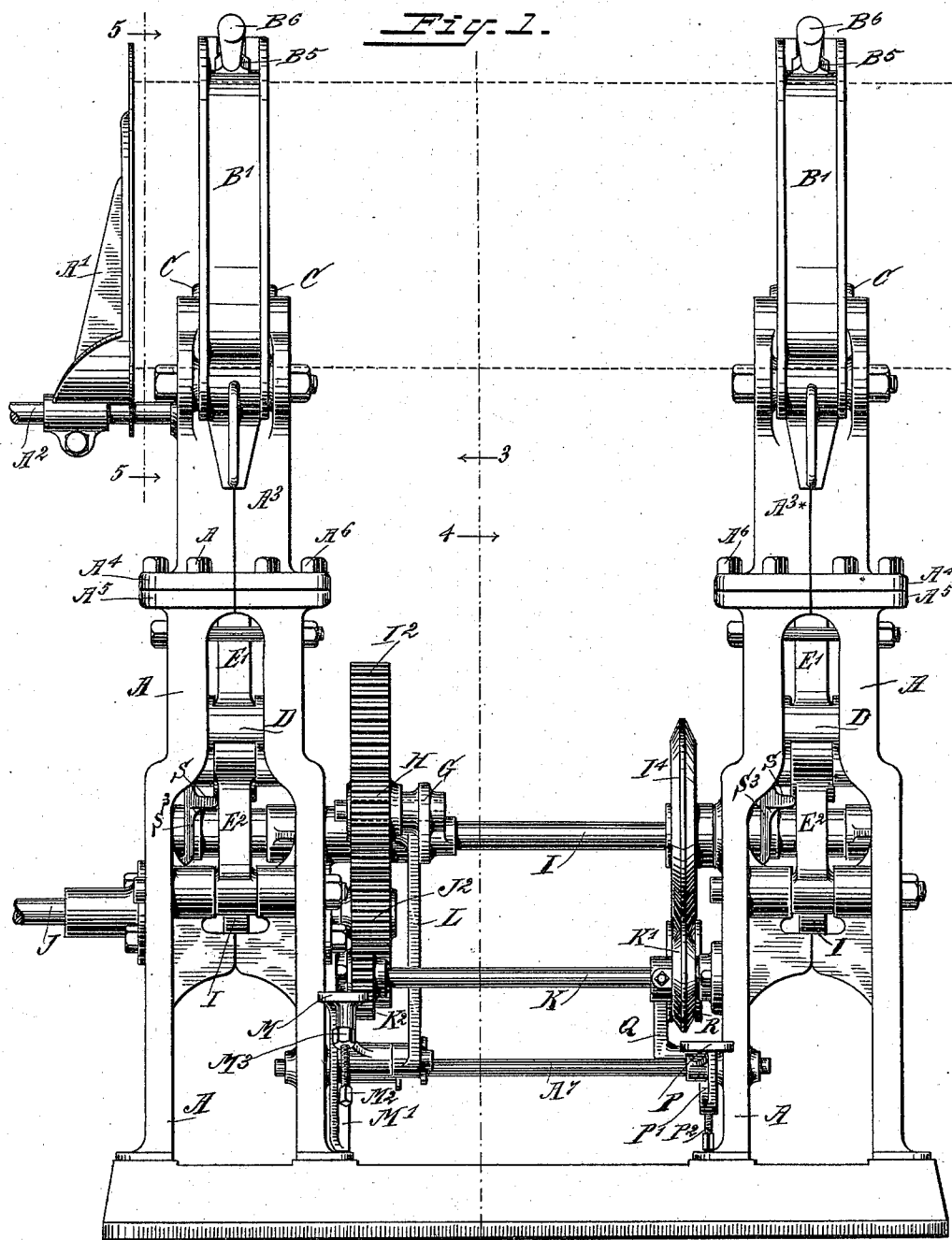


4 Sheets—Sheet 1.

No. 573,971.

Patented Dec. 29, 1896.



Henry F. Hirsch.
M. F. Boyle

Darwin A. Greene.

64 Thomas Drew Stetson
ATTORNEY.

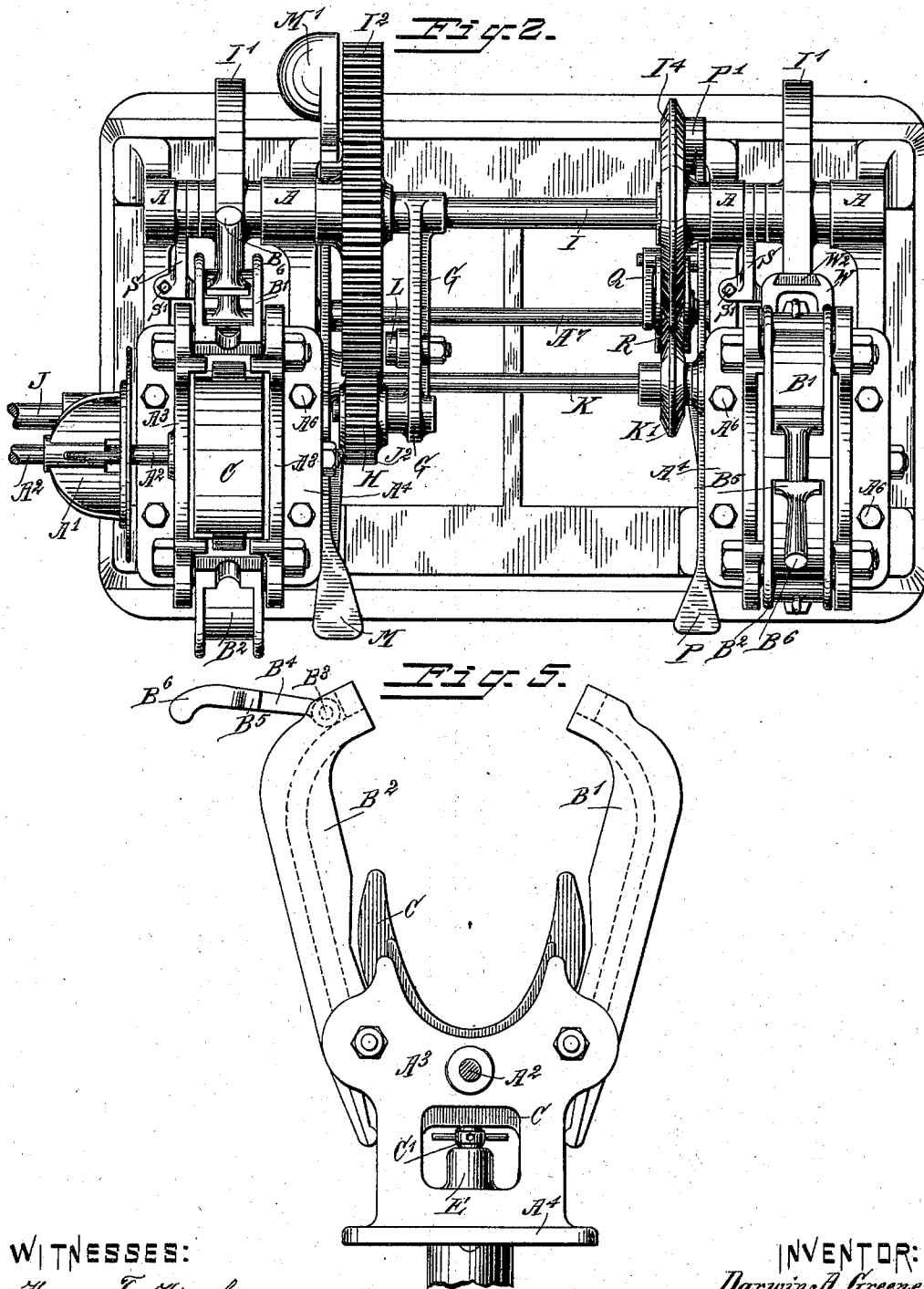
(No Model.)

4 Sheets—Sheet 2.

D. A. GREENE.
WOOD BUNDLING MACHINE.

No. 573,971.

Patented Dec. 29, 1896.



WITNESSES:

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(No Model.)

4 Sheets—Sheet 3.

D. A. GREENE.
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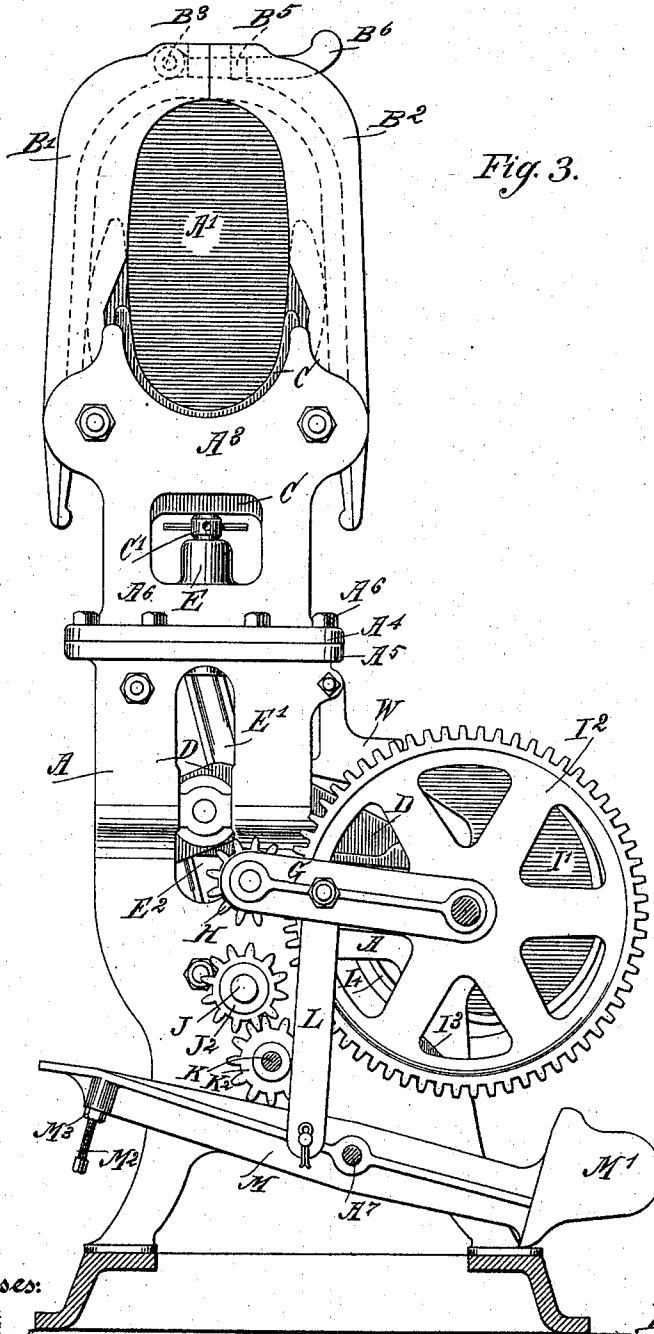


Fig. 3.

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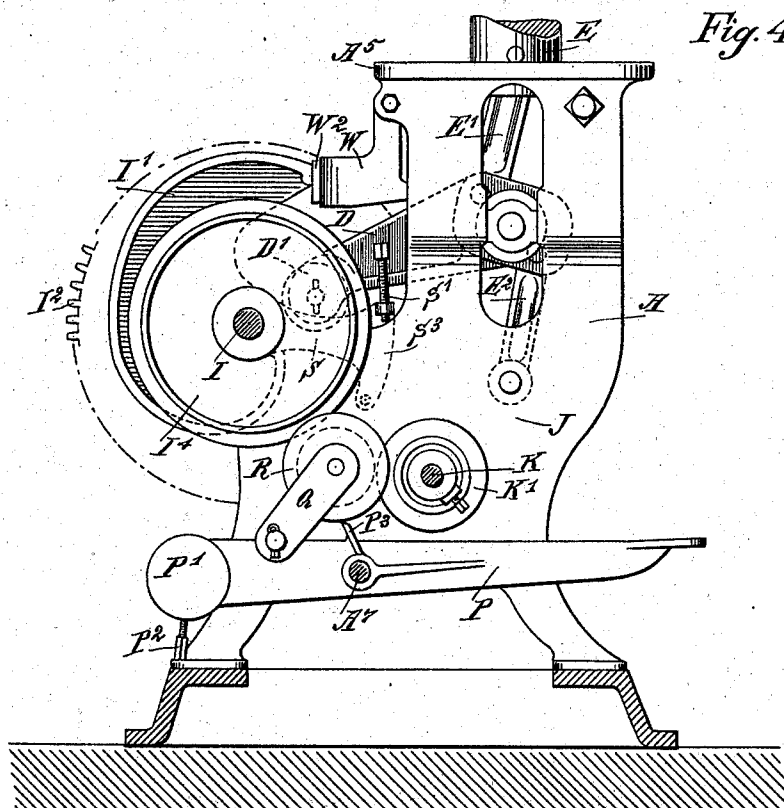
(No Model.)

4 Sheets—Sheet 4.

D. A. GREENE.
WOOD BUNDLING MACHINE.

No. 573,971.

Patented Dec. 29, 1896.



Witnesses:
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UNITED STATES PATENT OFFICE.

DARWIN A. GREENE, OF BROOKLYN, NEW YORK.

WOOD-BUNDLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 573,971, dated December 29, 1896.

Application filed October 11, 1895. Serial No. 565,429. (No model.)

To all whom it may concern:

Be it known that I, DARWIN A. GREENE, a citizen of the United States, residing in Brooklyn, Kings county, in the State of New York, have invented a certain new and useful Improvement in Wood-Bundling Machines, of which the following is a specification.

The machine may be used with advantage in other branches of the arts, but is intended more especially for preliminary bundling of relatively long pieces of wood to be subsequently sawed while in the bundled condition into a number of bundles of short lengths of wood suitable for domestic use in kindling fires. The wood, usually slabs previously divided by splitting-saws or otherwise into sticks of proper thickness and reduced to uniform lengths of about four feet, is placed in my machine and held together and tied by twines or other suitable confining means at two places near the ends. These long bundles produced in my machine are subsequently more powerfully compressed along their whole length, tied at sixteen or other number of uniform distances apart, and divided by gang-saws between these several tyings, thus producing a number of proper short bundles with only the labor of piling once in my machine. The subsequent treatment of the bundles need not be again referred to.

I employ the main working parts of two of the bundling-machines set forth in a patent to me dated June 23, 1896, No. 562,722, but with certain modifications, one of the most important of which is a provision for putting in the wood by a downward movement and for lifting out the long bundle by a vertical motion after it is completed. To effect this the straps which in my previous machine are continuous and immovable, and constitute each a fixed strap or yoke extending across over the bundle, are replaced by two bent jaws, which, when brought together, form at each of the two points required substantially equivalent yokes, but are capable of an easy movement and of being opened to allow each bundle to be removed and the wood to be supplied for the next. The sticks for a bundle may be introduced singly or in a mass by a direct vertical movement from above.

Although my improved machine is in fact a unit, it contains so nearly two machines, which are described in my patent as being

used singly, that I will venture to often refer to the two sides of my machine as two machines, designating them as "left" and "right," respectively. The terms cannot induce confusion in view of this explanation.

Among the modifications made in the two machines is the dispensing with some of the operating-levers and gears, one serving in place of two.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a front view, and Fig. 2 a plan view, showing the machine complete. Fig. 1 shows both yokes closed, the position of the long wood therein being indicated in dotted lines. The gage, which appears on the left side of the machine, is in practice set farther off, so that the ends of the long sticks project farther than is indicated beyond the tying-point. Fig. 2 shows the right side closed, but the yoke on the left side open. Fig. 3 is a vertical section on line 3 3 in Fig. 1, viewed from the left. It shows the parts on the left side of the machine, with the mechanism for effecting the compressing and releasing on that side and the gear which operates the compressing mechanism for both sides. Fig. 4 represents a section on line 4 4 in Fig. 1, seen from the left. It shows the right parts of the machine, with the mechanism for operating more or less plainly indicated, and the friction-gearing for operating the releasing mechanism for both sides. Fig. 3 shows the yoke closed. In Fig. 4 the yoke is omitted. Fig. 5 is a side view of one of the heads. This shows the yoke open.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the fixed framework, certain portions being indicated, when necessary, by super-numerals.

A' is the gage, against which the ends of the several long sticks are set in putting in the wood to produce a bundle.

A² is a bar on which said gage may be adjusted outward and inward.

A³ is the head which is nearest to the gage, and A^{3'} the head of what I have referred to as "the other machine."

Many of the parts are similar on each of the

two machines, and a description of one will suffice for both.

A⁴ and A⁵ are flanges, and A⁶ are bolts which hold these flanges together and secure the heads strongly and firmly to the main framing below. Each yoke is composed of two parts B' B², each part pivoted to the head at its lower end and curved near its upper end, so that the two, when together, form a yoke of the proper contour to mold the upper half of the bundle and of the proper strength to resist the considerable upward force impressed by the cradle C, which latter molds the lower half of the bundle and by its rising and lowering effects the application and the removal of the compressive force. The two halves B' B² of each yoke are tied together by a locking-piece B⁴, which is pivoted at B³ and adapted to engage strongly with a fork on the front half B' by means of a stout collar B⁵. The turning over and back at will is effected by means of the handle B⁶.

The cradle C is guided in vertical ways and is adjusted upward and downward by a right-and-left screw C'.

D is the lever which effects the compression, its center being allowed to move up and down in guides.

E is a block or cross-head, and E' E² are toggles operated by short arms of this lever. The turning of this lever D in one direction straightens the toggles and raises the cross-head or block E, which connects by the right-and-left screw C' with the cradle C, and consequently raises the cradle. The turning of this lever D in the opposite direction, by lowering the free end carrying the roller D', throws the toggles E' E² into an oblique position and lowers the block E and cradle C.

I is a stout shaft carrying a wiper I', which by being partially turned in one direction and the other effects these operations. A large gear I², fixed on this shaft I, receives an alternate rotatory motion in opposite directions through a small gear-wheel II, which is carried on a pin on a lever G, turning loosely on the shaft I. The wheel II is constantly engaged with the gear-wheel I²; but when it is in the elevated position shown in Fig. 3 it is ineffective.

J is the main driving-shaft, mounted in fixed bearings in the framing and rotated by a belt running on a pulley (not shown) which, it will be understood, is fixed on the overhung end at the left. The inner end of this shaft carries a gear-wheel J², which rotates constantly out of contact with the gear-wheel I², but ready to communicate power thereto through the gear-wheel II when the latter is lowered into engagement therewith. The direction of the forces which are transmitted tends to draw the wheel II downward as soon as engaged.

M is a foot-lever turning on the shaft A⁷ and connected to the lever G by a link L. The rear extremity of the foot-lever M carries

a weight M' and the front end is equipped with a broad surface to receive the foot of the attendant and with an inverted screw M², extending downward and adapted to strike by its head on the bed-plate and serve as a stop for the downward movement of the gear-wheel II. It is held by a jam-nut M³. The attendant need not be careful about the extent of his depression of the lever when he desires the cradle to rise and compress the wood, and, on the other hand, he need not concern himself to relax the pressure on the foot-lever when the compressing movement has proceeded far enough. A cam I³ is adjusted on the wheel I² in the right position to touch the rounded top on the lever M at a point near the rear end and depress that end, and consequently raise the treadle vigorously against the pressure of the foot and against the greater downward pressure due to the gears. When the hint is thus received by the attendant, he should relax the pressure of his foot, and the weight M' will complete the turning of the lever, raising the foot-lever into its highest position, and consequently raising the gear-wheel II out of engagement with the driving-gear I² and allowing the work to stop.

The shaft I extends across from the left to the right with bearings in each. It carries in the right-hand machine a similar wiper I', which induces a corresponding action on a similar compressing mechanism to that in the left-hand machine.

When the partial revolution of the shaft I in one direction has presented the most prominent parts of the two wipers I' under the corresponding two levers D and raised the cradles in the two machines so as to compress the wood, the parts remain in that position, holding the wood compressed until the reverse movement of the wiper I' is induced, which return is effected as follows.

A shaft K, mounted in fixed bearings, extends across from the left to the right side of the machine, equipped with a gear-wheel K², which engages with the gear-wheel J² and is similarly revolved with a constant motion, but in the opposite direction to that of the shaft J. This shaft in each of the two machines carries friction-gear which is ready to induce return motion—the turning of the shaft I in the direction to lower the cradles and relax the pressure on the wood. The mechanism is the same in each machine, and, as before, a description of one will suffice for the other.

The shaft K carries a small friction gear-wheel K', which revolves constantly. The shaft I carries a large friction gear-wheel I⁴, which is in the same plane with the wheel K', but out of contact therewith. When it is desired to relax the pressure on the wood by reversing the motion of the shaft I, the attendant operates a foot-lever P, having a counterweight P' and carrying an inclined link Q, on the upper end of which is mounted a fric-

tion gear-wheel R. When the attendant puts his foot on the front end of the lever P and depresses that end, it raises the weighted rear end and raises the link Q, and thereby forces the wheel R into frictional contact with both the wheels K' and I⁴, and immediately motion commences to be transmitted from the constantly-rotating shaft K to the shaft I, turning it in the direction to lower the cradles. This motion proceeds and the cradles are lowered.

When the reverse motion is prolonged, it will bring the point of the wiper I' in contact with a wood face W² on a hinged stop W, and its further motion in that direction is arrested. The capacity of the friction-gears to slip renders it unnecessary to make any provision for automatically throwing the friction-gear out of engagement.

The adjustments for determining the degree of compression effected by each machine and the extent to which the cradle is lowered in each machine may be varied independently. The tightness with which the bundle is compressed in either machine may be varied by turning the right-and-left screw C' in each machine, which intervenes between and connects the cradle with the cross-head or vertically-guided block E below.

S is a piece of metal (see Figs. 1, 2, and 4) centered loosely on the shaft I alongside of the wiper I' in each machine and having a cross-piece, one end of which carries a screw S', which rests on the framing and holds the piece up strongly. The other end of the cross-piece engages under the lever D and when the latter descends supports it. The termination of the descent of the lever D, and consequently of the cradle C, controls the size of the space provided in each machine for the wood. If we want more room for the wood in either machine, the screw S' is turned to let the part S, and consequently the lever D and the cradle C, in that machine descend lower. An arm S³ extends laterally from the lower edge of the piece S and engages under a lip on the frame. (Shown in dotted lines in Fig. 4.) This gives all the freedom required for adjustments and prevents the piece S from ever being raised too high. Without this arm S³ the piece S might be raised by the friction of the shaft I so high that it would not promptly drop. It might even be thrown quite over the shaft, so as to drop on the rear side and derange the action.

P² is a screw tapped into the counterweight P', which lifts the treadle P. This screw P² strikes the foot of the machine. It may be adjusted to regulate the height to which the treadle P will rise.

P³ is a spur cast on the upper side of the lever P in the position represented. It receives the friction gear-wheel R and supports it in about the correct position when not in use. This wheel should have freedom to find its bearings equally between the friction gear-wheels K' and I⁴ when the treadle is depressed

and this part of the apparatus is brought into action.

The fact that the two parts B' B² of the yokes are pivoted at a certain distance apart is important. When these parts are thrown together, gravity holds them together, and when they are thrown apart gravity holds them apart.

It will be noted that the two parts B' B², composing the yoke when closed, form an efficient abutment for the compression, the pivots for such parts being set in the frame in the positions shown below the bundle, but at so widely-separated points that by gravity the parts will be held either open or closed, as required, the piece B⁴, turning on the pivot B³ in the one part, permitting the ready engagement and disengagement of the other part.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention. Additions may be made. An efficient guard should be used to shield the gearing from being injured by wood dropping accidentally into it. Such may be made in the ordinary manner of stout sheet metal and will not require description.

What I claim as my invention is—

1. In a wood-bundler the combination with a cradle C and means for raising and lowering it, of a yoke composed of two parts B', B², extending over such cradle, and adapted to open and close to coöperate with the cradle in clamping the wood, all substantially as herein specified.

2. In a wood-bundler, the combination with a cradle C and means for raising and lowering it, of a yoke composed of two parts B', B², pivoted below and extending over such cradle, to coöperate with the same in clamping the wood, and with a lock-piece B⁴ pivoted at the top of the part B² and designed to engage the part B', to hold said parts together, all arranged for joint operation substantially as herein specified.

3. In a wood-bundler the combination with a cradle C and means for raising and lowering it, of a yoke composed of two parts B', B², extending over such cradle, and adapted to open to allow the wood to be introduced and removed at the top, and to close to form an efficient abutment for the compression, the pivots for such parts being set in the frame in the position below the bundle but at so widely-separated points that gravity can hold the parts either open or closed as required, and with the locking-piece B⁴ turning on the pivot B³ in the one part and having means for taking hold of and releasing its hold on the other part at will, all arranged for joint operation substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

DARWIN A. GREENE.

Witnesses:

J. B. CLAUTICE,
M. F. BOYLE.