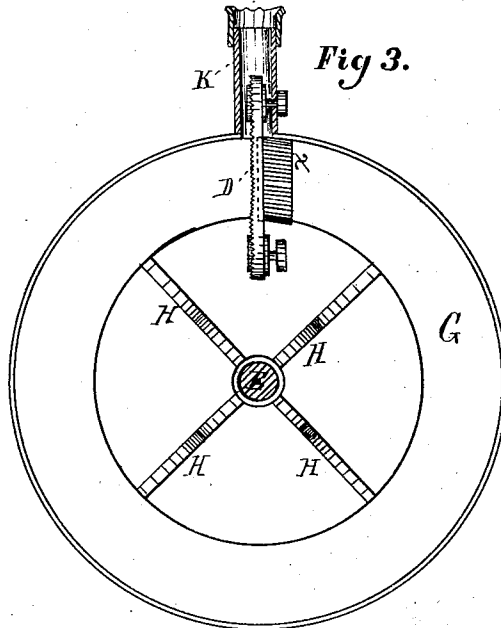
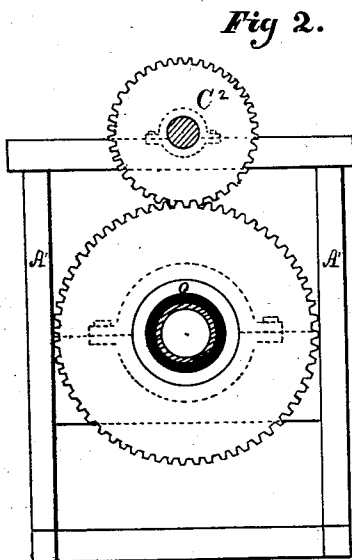
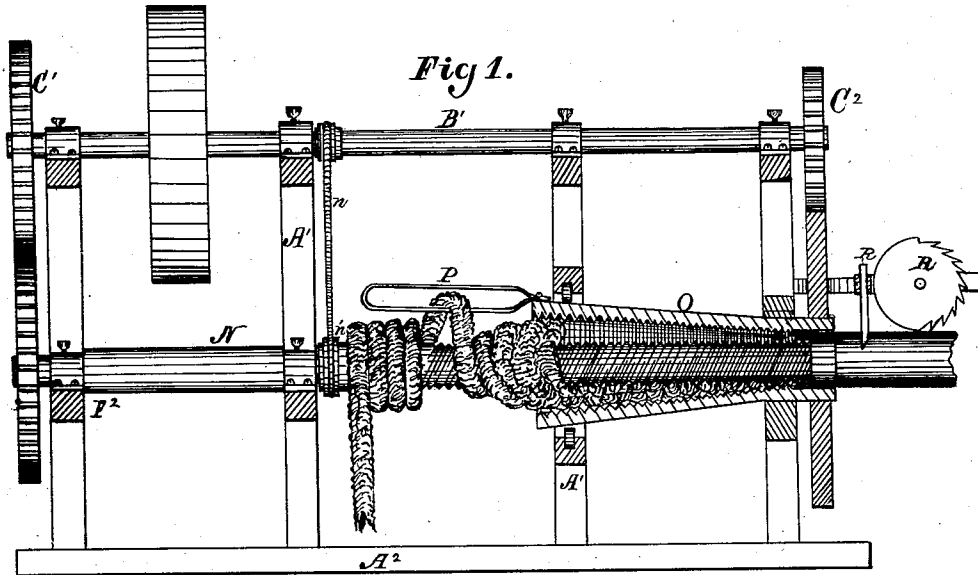


JAMES KENT GRIFFIN.

Process and Apparatus for the Manufacture of Roofing, Flooring, Pipes, etc.  
No. 121,166.

Patented Nov. 21, 1871.



WITNESSES:

*Albert H. Norris.*  
*Parker H. Sweet, Jr.*

INVENTOR:

*James Kent Griffin.*  
*per James L. Norris*  
*his Attorney.*  
*Washington, D.C.*

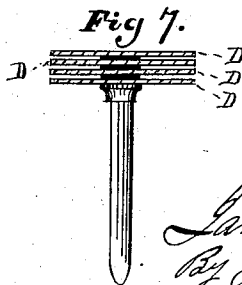
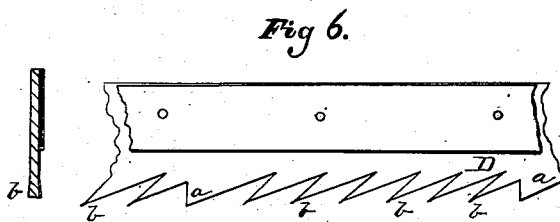
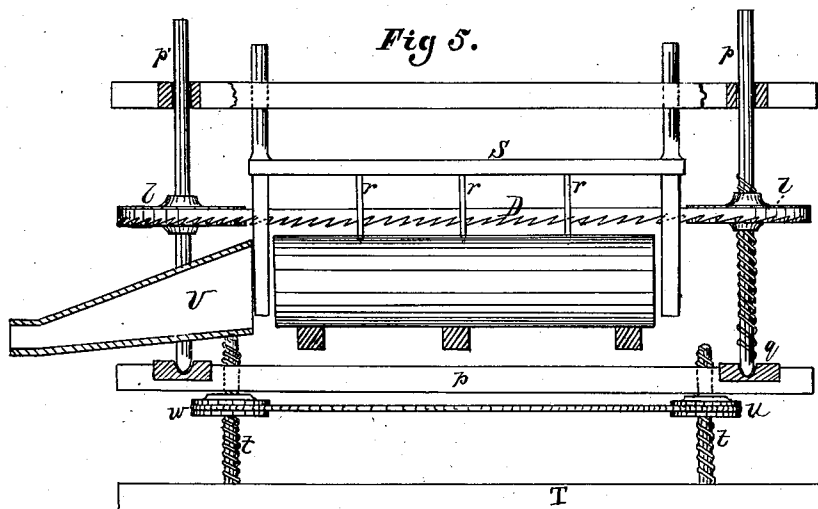
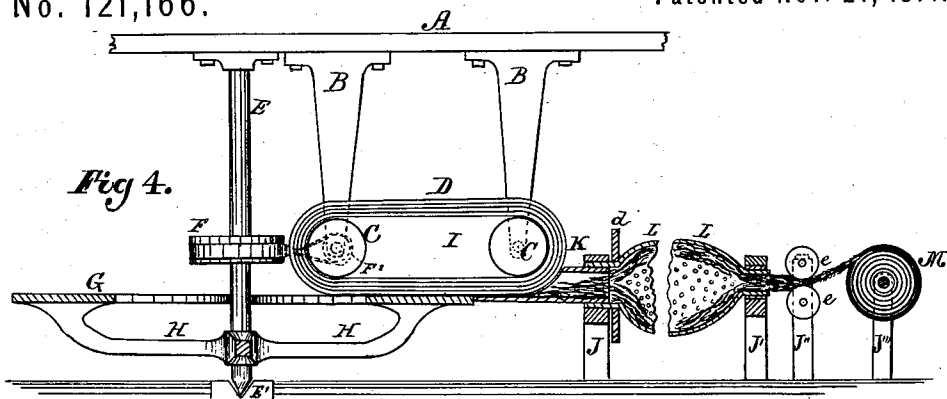
JAMES KENT GRIFFIN.

3 Sheets--Sheet 2.

Process and Apparatus for the Manufacture of Roofing, Flooring, Pipes, etc.

No. 121,166.

Patented Nov. 21, 1871.



WITNESSES:

Barth H. Sweet, Jr.

INVENTOR:

James Kent Griffin.  
By James L. Norris,  
his Attorney.

JAMES KENT GRIFFIN.

Process and Apparatus for the Manufacture of Roofing, Flooring, Pipes, etc.  
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*Fig 8.*

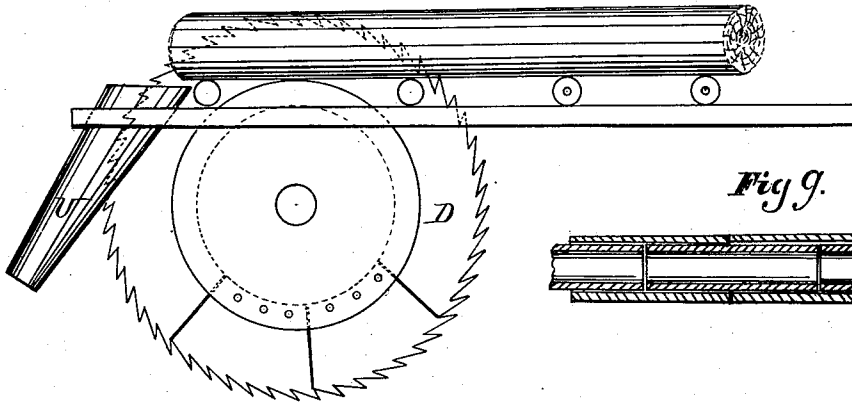


*Fig 9.*

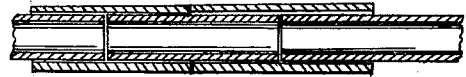


*Fig 10*

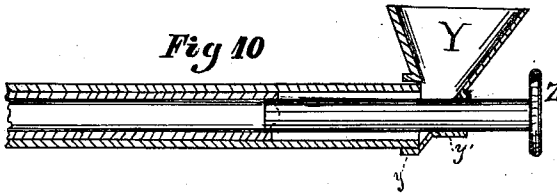
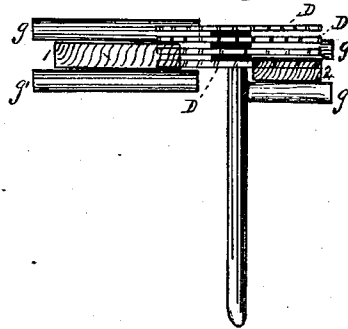


*Fig 11.*



**WITNESSES:**

*Parker H. Sweet, Jr.*  
*Wm. J. Duffon.*

**INVENTOR:**

*James Kent Griffin.*  
*By James E. Norris*  
*att.*  
*Washington, D.C.*

# UNITED STATES PATENT OFFICE.

JAMES KENT GRIFFIN, OF WATERDOWN, CANADA.

## IMPROVEMENT IN PROCESSES AND APPARATUS FOR THE MANUFACTURE OF ROOFING, FLOORING, PIPES, &c.

Specification forming part of Letters Patent No. 121,166, dated November 21, 1871.

*To all whom it may concern:*

Be it known that I, JAMES KENT GRIFFIN, of Waterdown, in the county of Wentworth, in the Province of Ontario, in the Dominion of Canada, have invented a new and useful Improved Process and Machine for Manufacturing Pipes, Roofing, Flooring, and other Articles from Disintegrated Wood, of which the following is a specification:

Figure 1, in Plate 1, is a central longitudinal section of my improved machine, showing the core, revolving funnel, and their operation. Fig. 2 is a front-end view of the same machine. Fig. 3 is a top or plan view of the revolving table and band-saws. Fig. 4, in Plate 2, is a side view of the machine, illustrating the band-saws, centrifugal condensing and drying-cylinder, circular table, &c., and showing their operation. Fig. 5 is a side view, showing the band-saw, the means of its adjustment, and the exit-chute. Fig. 6 is a side view of a section of the band-saw, showing the formation of the teeth and the rubber belt; also a cross-section of the same. Fig. 7 is a transverse section of the series of circular saws mounted on an arbor. Fig. 8, Plate 3, is a side view of the circular saw, exit-chute, and a log in position. Fig. 9 shows the method of uniting pipes together by breaking joints. Fig. 10 is a central section of an improved device for lining pipes. Fig. 11 is a transverse central section of a series of saws arranged for sawing the fiber in sizing lumber.

Letters Patent were granted to me by the United States on the 3d day of October, 1871, No. 119,601, for the manufacture of pipes, roofing, flooring, and other articles from disintegrated wood. The object of this present invention is to improve upon the machine and process for producing disintegrated fiber and for manufacturing articles, &c., as described in said Letters Patent. This invention consists, therefore, first, in mounting one or a series of band-saws upon suitably-supported pulleys, which, acting in combination with a revolving table or platform, will have the effect of forming fiber lengthwise from the wood, which is fed laterally against the teeth of the saws. The second part of my invention consists in the means of causing the saws or series of saws to be fed regularly and uniformly to the wood to be operated on, so that fiber of equal size will be

produced and the operation of producing the same rendered continuous, for a purpose herein-after described. The third part of my invention consists of a centrifugal drying and condensing-cylinder, to which is imparted a rotary motion, so that a twisting movement is communicated to the fiber passed into or through the said cylinder for the purpose of forming pipe, &c. The fourth part of my invention consists of a screw-core operating within a stationary or revolving hollow conical-shaped cylinder, so that wood or other fibrous material supplied to the said core may be gradually compressed between the outer surface of the screw-core and the inner surface of the conical-shaped cylinder and conveyed forward by means of the spiral surfaces of the said cone and cylinder. The fifth part of my invention consists in forming the screw-core hollow, so as to permit of the passage of cold water or a blast or current of air through the same, whereby the heat produced by friction of the material within the conical cylinder is regulated. The sixth part of my invention consists of a loose thimble arranged to revolve uniformly or differentially with the said screw-core, so as to supply the fibrous material to the core and conical cylinder as it may be required. The seventh part of my invention consists in arranging a revolving knife, cutter, or saw in front of the pipe as it issues from the end of a core and cylinder, so as to divide the said pipe. The eighth part of my invention consists in intermixing with the wood or other fibrous material pulverized stone, iron, or other mineral substances, either by mixing them with the fiber in the condenser and drier or otherwise; or by mixing them with the preserving or adhesive compounds in the vat; or by applying them to the surface of the wood-phalt while in a soft or fresh condition and pressing them into or onto the produced article or sheet, so as to give the nature or imitation of other substances or articles, as may be desired. The ninth part of my invention consists in forming embossed, ornamental, or varied surfaces while the article is being produced from the material, with various configurations, figures, designs, letters, moldings, &c., whether the same be raised or depressed upon the surface of one or both the pressing-rollers or plates, between which the material passes properly formed; and

finally, my invention consists of a combination of parts, as will be more fully described hereafter.

In the accompanying drawing, A represents the top framing of the machine, from which depend hangers B B, upon which are hung journaled pulleys C C. Around these pulleys are arranged one or more band-saws, D, having secured upon their sides sheets of rubber, or its equivalent, for the purpose of preventing breakage and heating, and especially increase friction, so as to prevent their lateral or circular displacement. A vertical shaft, E, has one end journaled upon the frame A and its other end bearing in a step, E', and carries upon it a band-pulley, F, and a table or platform, G, the latter being braced or supported by bridges or arms H. This table is arranged so as to revolve below the band-saw or saws, motion being imparted to the same by a belt passing around the pulley F and the pulley F', by which means motion is also communicated to the band-saw or saws. The timber from which the fiber is to be cut may be of any quality and size, and is arranged diametrically upon the revolving table in such a manner that it will be moved or fed laterally up against the teeth of the saw or saws, the portion of the timber equal to the depth of the series of saws next to the table being first reduced or cut up, the weight of the top portion of the wood holding the bottom in a firm and rigid position, thus resisting the action of the saws. The uncut or top portion of the wood, as the table revolves, passes through or between the open space I formed by the said band-saws. The teeth of the saws are formed as shown in Fig. 6—that is, in the usual manner, except that they are “swaged,” as shown in cross-section, instead of “setting” them—and at stated distances apart are produced chisel-shaped teeth *a*, so that, as the fiber is produced or stripped by the teeth *b*, the chisel-shaped teeth cut the same into suitable lengths. L is a centrifugal condensing and drying-cylinder, the ends of which are of a tapering form, and are supported upon standards J J'. The end of this cylinder next to the band-saw or saws connects with a pipe, *c*, through which pipe the produced fiber is conveyed into the cylinder. A pulley, *d*, connects with the cylinder L, so that when motion is imparted to the same the cylinder is caused to revolve, when the fiber entering the cylinder is caught up and spreads by centrifugal force toward the surface of the cylinder, whereby it is twisted and condensed and at the same time dried. This twisting of the fiber into rope is promoted by a pair of holding and drawing and pressing rollers, *e e*, arranged upon the standards J''.

If pulverized stone and mineral substances are fed in with the fiber as it enters the cylinder L the same will be thoroughly intermixed with the fiber composing the rope. After the rope thus produced (with or without the pulverized material) passes between the holding, drawing, and pressing rollers *e e*, the same is flattened and then passes around a roller, M, supported on

standards J''', from which it is removed, rolled up, and ready for baling or use.

In Fig. 1, A<sup>1</sup> represents standards mounted upon a base-piece, A<sup>2</sup>, and support, at or near their upper ends, a horizontally-arranged shaft, B<sup>1</sup>. This shaft B<sup>1</sup> is provided, at or near its ends, with spur-wheels C<sup>1</sup> C<sup>2</sup>, which gear or mesh with similar wheels, D<sup>1</sup> D<sup>2</sup>, the former upon the screw-core and the latter upon a conical-shaped cylinder. Motion is imparted to the shaft B<sup>1</sup> by means of a band-pulley, E<sup>1</sup>. F<sup>2</sup> are cross-pieces, arranged between the standards A<sup>1</sup> A<sup>1</sup>, and are designed to support bearings, within or upon which revolves the screw-core N. The screw-core N may be made solid, as in my former Letters Patent; but I prefer to make it hollow, so that a current or jet of cold air or water may be forced through the same for the purpose of regulating the heat produced by friction or otherwise. O is a hollow conical-shaped pressing-and-forming cylinder, having its interior surface formed with spiral corrugations or ribs. The pressing-and-forming cylinder O is made of a conical shape, so as to compress gradually, as it revolves, the fibrous material to the degree of solidity required. The fibrous rope, previously to being wound upon the screw-core, is passed through a vat containing adhesive preserving compounds, as described in my former Letters Patent. The speed and spiral threads of the said cylinder and core are so regulated in relation to each other as to press uniformly and with equal force in an outward and horizontal direction. Upon the screw-core N is arranged a loose thimble, *o*, for regulating the speed of the fibrous rope, and which thimble may revolve uniformly or differentially with the same, its speed being governed by a belt or rope, *n*, passing around the pulley *m* of the shaft B<sup>1</sup> and the pulley *n'* of the thimble. P is a guide, rigidly secured upon the pressing-and-forming cylinder O for distributing the fibrous rope.

Instead of introducing pulverized stone, iron, mineral, or other substances, such as artificial stone or cement, into the centrifugal cylinder, as before mentioned, I propose either to intermix the pulverized material in the vat with the preserving or adhesive compounds, or apply them directly to the fibrous rope or material as it enters the conical-shaped cylinder.

For the purpose of making sheeting, roofing, flooring, &c., from the pipe thus produced, I have arranged a stationary or revolving knife or cutter, R, in such a manner that as the pipe emanates from the pressing-and-forming cylinders the same will be severed or divided longitudinally, for the purpose of flattening by passing the same between plates or pressing-rollers.

In Fig. 5 is a band-saw, D, or series of same, packed for cutting fiber longitudinally from logs of wood. In this case the saw or saws pass around and are driven by the pulleys *l l*, the said pulleys being arranged upon the arbors *p p'*, which have their support and bearings in the steps *q q* of the bed P'. S is a frame, carrying a series of prongs or guides, *r r*, one on each side

of the saw, adapted to rise and fall, by which means the saws are guided in their start, the log being held in position by suitable contrivances. The saw D is uniformly, automatically, and snugly adjusted, in respect to its cutting the fiber longitudinally, by means either of the saw-pulleys running down upon the arbor *p* as the saw revolves and removes the fiber, or by means of lowering the bed P by means of the pulleys *u u* working upon the screw-standards *t t* attached to the base-piece T. At a suitable point upon this frame is arranged a chute, V, designed to receive and conduct away the fiber for treatment, as hereinbefore mentioned.

Without any departure from my invention I propose to use one or more circular saws; and if a series are used they are packed together one upon the other, with interposed washers, as shown in Figs. 7 and 8. When such class of saws are used they are made to revolve in an opposite direction to the ordinary method of ripping or sawing lumber, by which means they detach the fiber instead of making saw-dust.

In Fig. 11 a series of revolving saws is shown as packed together for the purpose of reducing planks into fiber, the planks being fed laterally to the saws between feeding-rollers *g g*, the plank No. 1 being fed with its edge to the saws, while No. 2 is fed to the under side of the same.

In Fig. 9 is shown a method of joining pipes produced, as above described, by placing one within the other, breaking joints.

In Fig. 10 is a novel method of lining pipes, as above produced, with cement or composition. To line such pipes a funnel or hopper, Y, is employed, which has a side opening, *y*, fitting upon the end of the pipe. A similar opening, *y'*, is produced in the neck of the funnel, through which is introduced a plunger, Z, of a diameter less than the interior of the pipe, so that a space is left, into which the lining, cement, or composition settles. The plunger and funnel are then withdrawn and another section adapted, and the operation continued.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A centrifugal condenser, L, provided with tapering ends or necks, for the purpose of receiving and intermixing wood or other fiber, substantially as set forth.

2. A centrifugal condenser for receiving and intermixing wood or other fiber, in combination

with holding, drawing, and pressing rollers, substantially as set forth.

3. A centrifugal condenser, L, in combination with one or more band-saws, D, and a conductor, K, operating as set forth, for the purpose specified.

4. One or more band-saws, arranged as described, in combination with the revolving table G and centrifugal condenser L, substantially as set forth.

5. Rope produced from wood fiber, as an article of manufacture.

6. The screw-core N, made hollow for the passage of blasts or currents of cold air or water to regulate the heat produced in the manufacture of wood or other fibrous pipe.

7. The loose thimble, arranged upon the screw-core N, for the purpose specified.

8. A hollow conical-shaped pressing-and-forming cylinder, O, having internal spiral corrugations or ribs, substantially as and for the purpose set forth.

9. The combination of the screw-core N and conical-shaped pressing-and-forming cylinder O, arranged and operating substantially as set forth.

10. A stationary or revolving knife, cutter, or saw, R, for dividing pipe produced from wood or other fibrous material, when operating in connection with a core, N, and cylinder O.

11. The funnel Y and plunger Z, constructed and operating as and for the purpose set forth.

12. The rubber packing, or its equivalent, arranged upon the sides of the saws.

13. The gear C<sup>1</sup> for operating the screw-core, in combination with the gear C<sup>2</sup> for operating the pressing-and-forming cylinder.

14. One or more band-saws mounted upon pulleys C C, arranged for cutting fiber lengthwise from logs, substantially as herein shown and described, and for the purpose set forth.

15. Fiber-stone, produced by intermixing the fiber of wood, manufactured as described, with pulverized artificial or natural stone, mineral, or cement with an adhesive compound, or their equivalents, substantially as and for the purposes set forth.

To the above I have signed my name this 13th day of October, A. D. 1871.

JAMES K. GRIFFIN.

Witnesses:

ALBERT H. NORRIS,  
JAMES L. NORRIS.

(126)