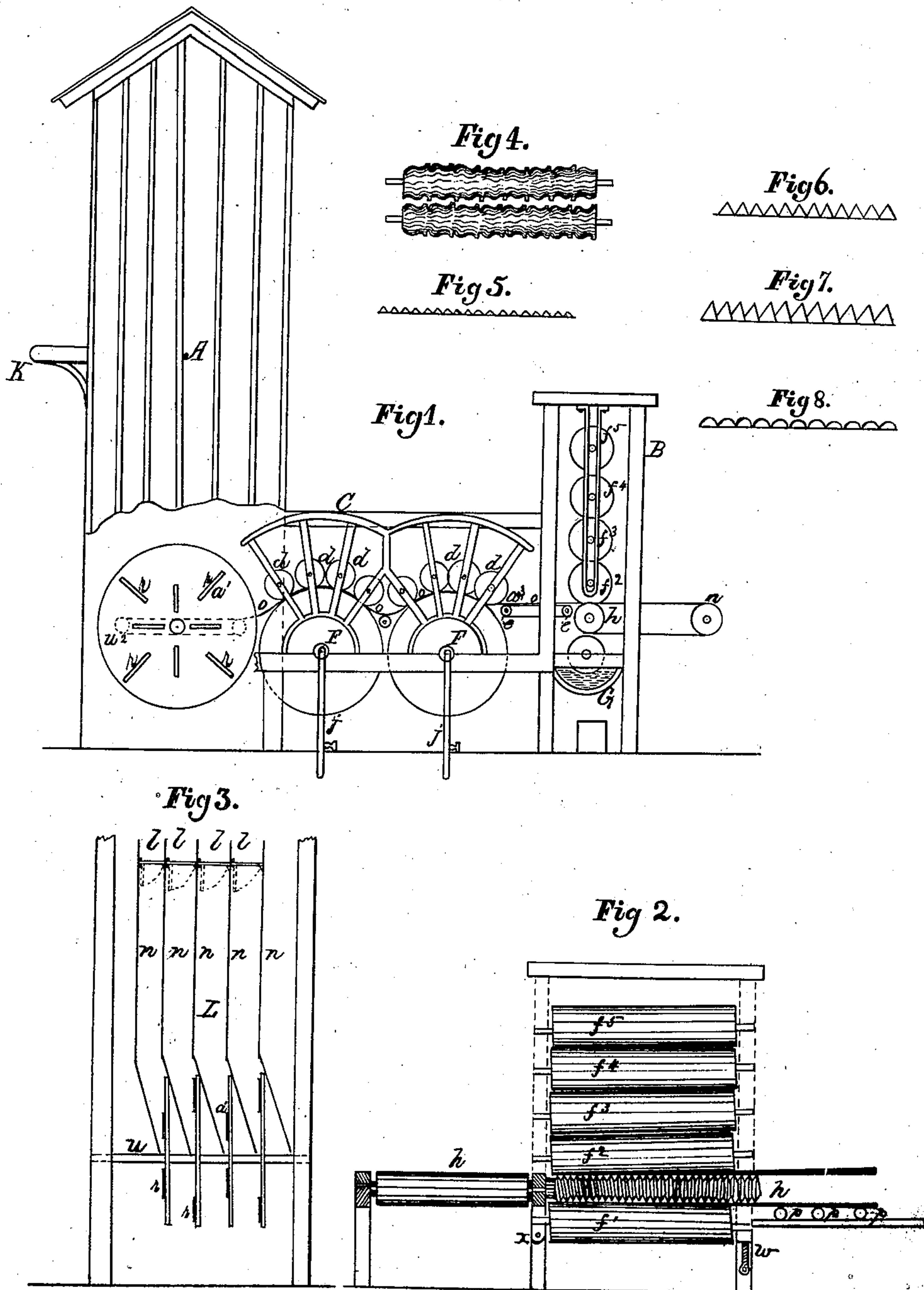


JAMES KENT GRIFFIN.

Manufacture of Articles from Disintegrated Wood.

No. 119,601.

Patented Oct. 3, 1871.



WITNESSES:

Parker H. Sweet, Jr.
P. H. Sweet, Jr.

INVENTOR:

James Kent Griffin.
 By his Atty-
James L. Norris.

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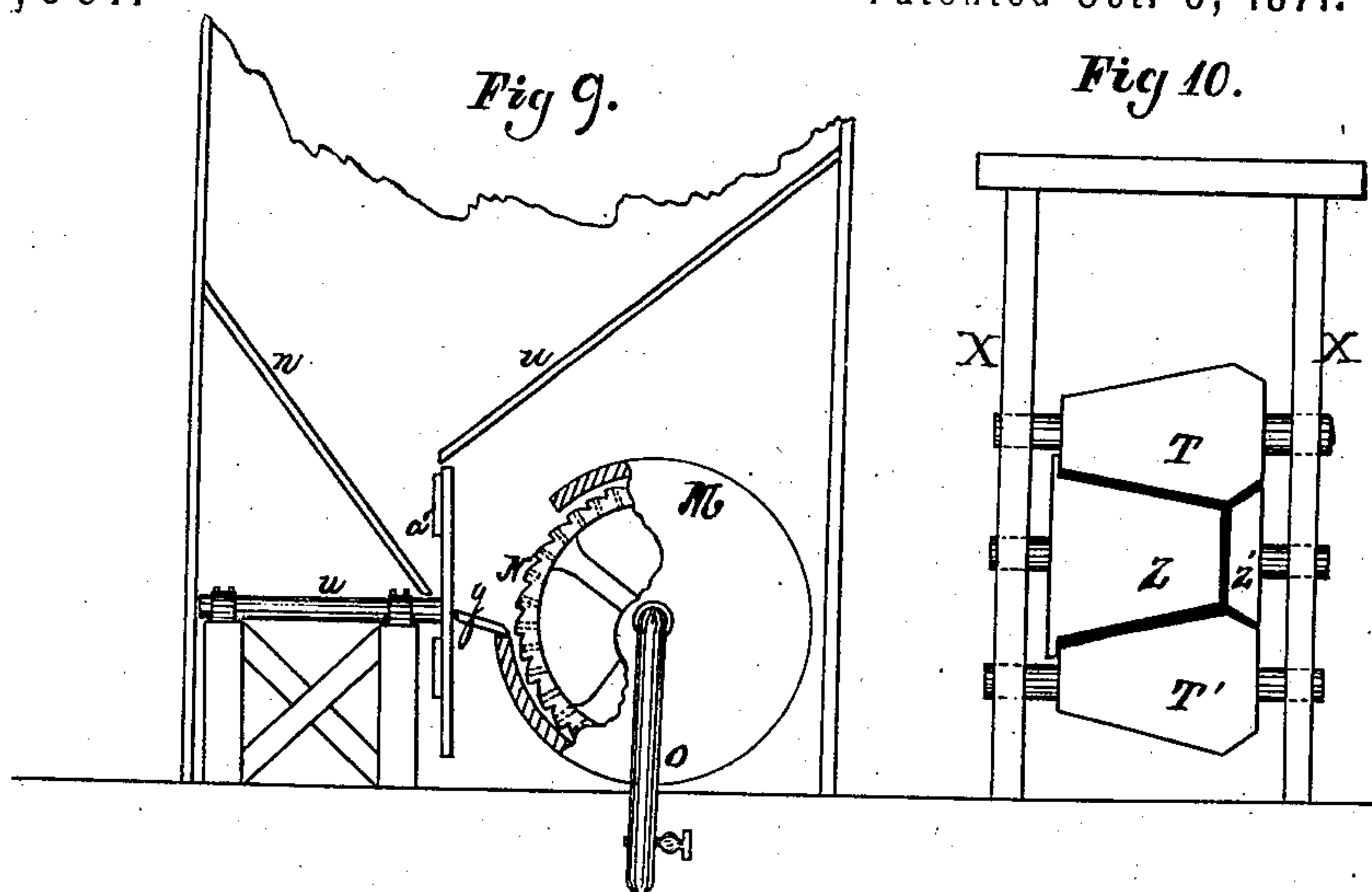


Fig 11.

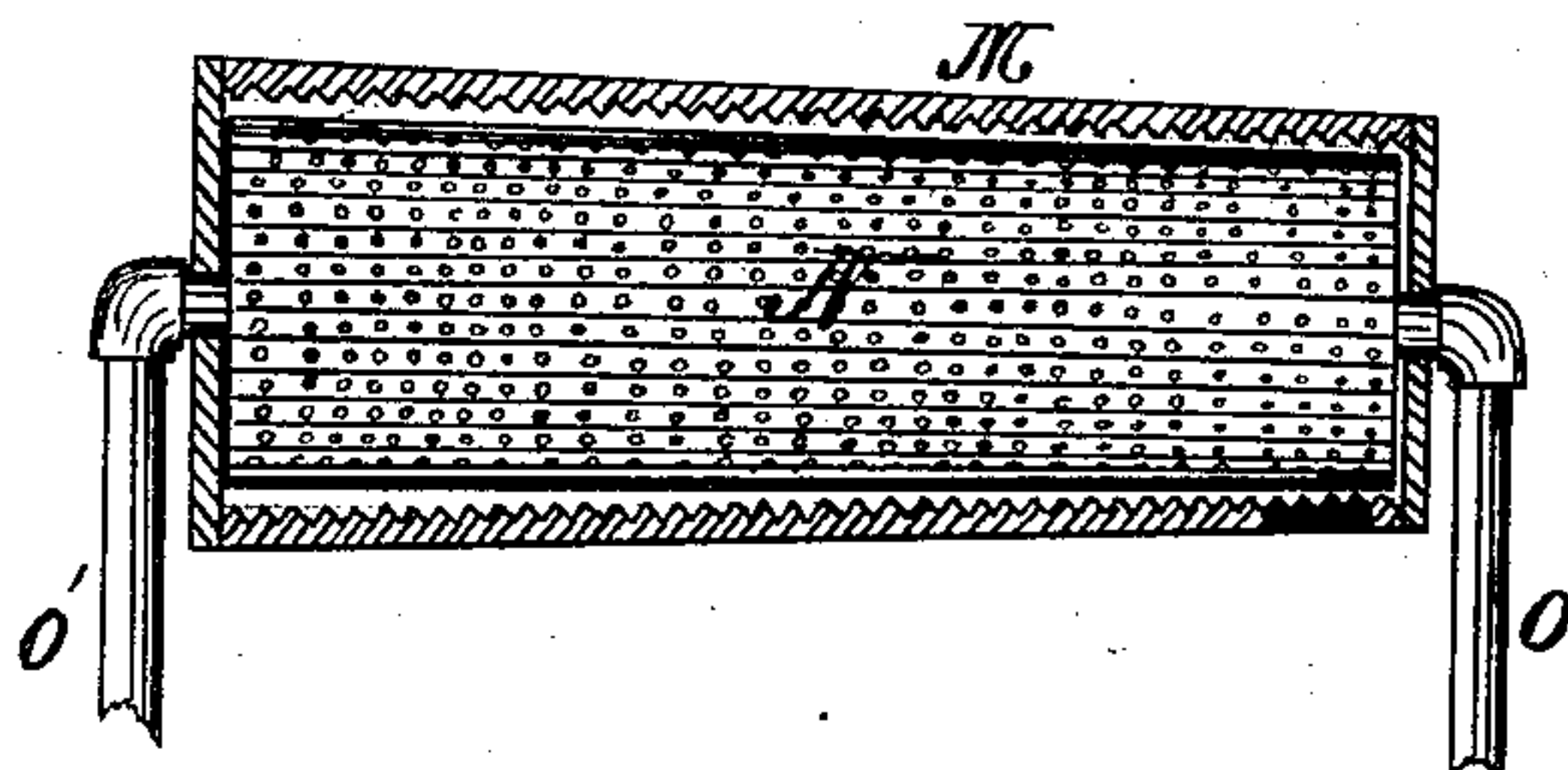
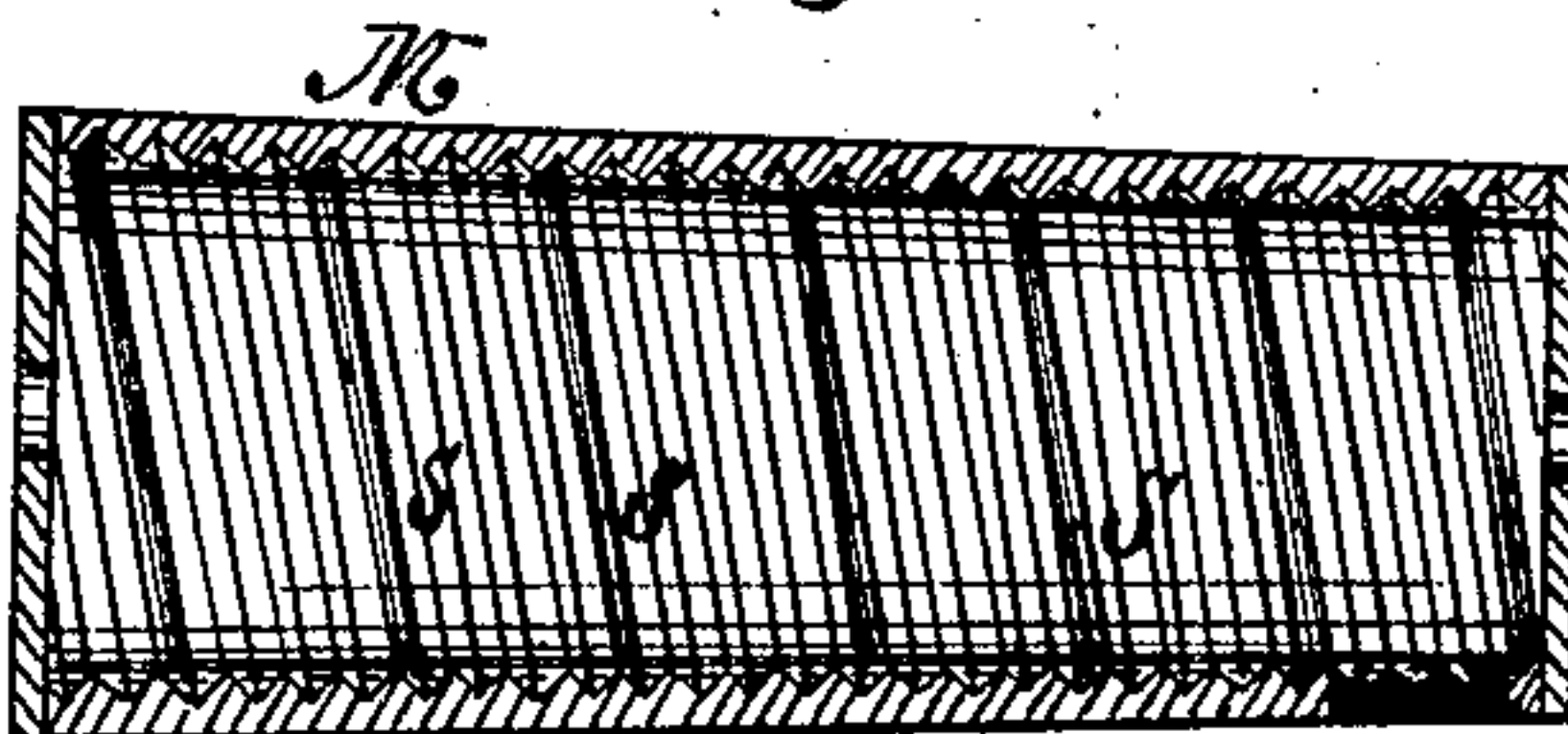


Fig 12.



WITNESSES:

Parley H. Sweet, Jr.
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INVENTOR:

James Kent Griffin.
 By his Attorney
 James L. Norris

UNITED STATES PATENT OFFICE.

JAMES KENT GRIFFIN, OF WATERDOWN, CANADA.

IMPROVEMENT IN THE MANUFACTURE OF PIPES, ROOFING, FLOORING, AND OTHER ARTICLES FROM DISINTEGRATED WOOD.

Specification forming part of Letters Patent No. 119,601, dated October 3, 1871.

To all whom it may concern:

Be it known that I, JAMES KENT GRIFFIN, of Waterdown, county of Wentworth, province of Ontario, in the Dominion of Canada, have invented a new and Improved Process and Machine for Manufacturing Articles from Refuse and other Wood, and Fiber, &c.; and I do hereby declare the following to be a full, clear, and exact description thereof sufficient to enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawing, in which—

Figure 1, Plate No. 1, is a side elevation of my improved machine for manufacturing articles from refuse and other wood, fiber, &c. Fig. 2 is a rear view of the adjustable rollers, pipe-core, &c., in position. Fig. 3 is a longitudinal central section of the revolving cutters and the feeding-chutes. Fig. 4 is a rear view of the corrugated rollers for forming articles of irregular form or surfaces. Fig. 5 is a cross-section of the surface of the rotating heaters. Figs. 6 and 7 are cross-sections of the surface of the small pressing-rollers. Fig. 8 is a cross-section of the surface of the oscillating pressing-rollers. Fig. 9, Plate No. 2, is modification of Fig. 3, plate 1, wherein a single cutter is employed with a rotating disintegrating cylinder, with or without the rotating heaters and pressing-rollers. Fig. 10 is a front view of pressing-rollers and cone for forming irregular-shaped vessels, such as buckets, &c. Fig. 11 is a longitudinal central section of the said rotating disintegrating-cylinder arranged within its case; and Fig. 12 is a longitudinal central section of the case, showing its interior construction.

The first part of my invention relates to a certain novel and useful process in treating refuse or other wood or suitable fibrous matter whereby I am enabled to produce articles of any known form by disintegrating the fiber of the wood, and using it with such compounds as are adapted to the various purposes to which it is applied, and forming the united fiber and compounds by suitable mechanism into the shape or form of article or manufacture required. The second part of my invention consists of a series of chutes arranged within a steam-chest so as to operate in connection with its own separate revolving cutter or knife. The third part of my invention con-

sists in arranging between each revolving plate carrying the cutters, an endless apron whereby the mass of shaved wood is carried or fed to the heating-cylinders, &c. The fourth part of my invention consists in combining with the heating and drying-cylinders pressing and oscillating corrugated rollers to further disintegrate, divide, and reduce the fibrous material. The fifth part of my invention consists of a novel automatic delivering screw-core, by the form and means of which continuous pipes can be made of uniform size. The sixth part of my invention consists of a double automatic delivering-core, whereby a sheet for roofing, flooring, sheathing, &c., can be manufactured of any size and thickness. The seventh part of my invention consists of forming embossed or ornamental surfaces out of the material heretofore mentioned, such as moldings, &c., by the employment of revolving pressing-rollers, geared together, and having irregular, corrugated, embossed, or other ornamental or varied surfaces. The eighth part of my invention consists in arranging within a case a rotating cylinder, said case and cylinder being so formed as to thoroughly disintegrate, divide, season, and reduce the fibrous material between the periphery of the cylinder and the interior surface of the case, and by the spiral ribs of the case cause the disintegrated mass to be automatically delivered through a suitable opening in the case to the forming mechanism. The ninth part of my invention consists in combining in one and the same rotating cylinder the following: A centrifugal drying-cylinder for expelling the sap and water, with or without a hot or cold air-blast; a heating-cylinder, and a disintegrating-cylinder, said cylinder being provided with a series of cutting-edges and perforations, and connected with a steam-pipe for supplying the air and steam to the respective ends of the cylinder.

The wood, such as cord-wood, slabs, refuse wood, or other fibrous matter is first steamed by being placed in the steam-chest A, the door of which will be at the point above the platform marked K. When the wood is sufficiently softened it is removed to the chamber L immediately underneath by opening the trap-doors *l l l l*, and dropping it between the partitions *n n n n*, when it settles against the revolving-cutters *r r*, keyed on the shaft *u*, which shave the wood

to the required degree of thinness as it passes through the orifices $a^1 a^1 a^1 a^1$, when it falls upon the apron u^2 , which runs between the cutters, and is thereby carried to the drying-cylinders F F, which are heated by hot air, steam, or water, by means of the pipes $j j$, or their equivalents. The rotating cylinders F F perform the double function of drying the reduced wood or other fiber under the small iron rollers $d d d d$, which revolve in the guides of the frame C, every alternate one of which oscillates on the heaters E E, and by their varied corrugated surfaces, shown at Figs. 5, 6, 7, and 8, spread, disintegrate, divide, and still further reduce the wood, so that its fiber is sufficiently divided and softened for the purpose of receiving the adhesive and preserving compound in the vat G. As the fiber passes over the apron a^3 , which revolves on the small rollers $e e$, it is coated and filled with the adhesive and preserving compound, and it is then fed to the core h , upon which it is wound and rolled between the pressing-roller f and feeding-roller f' .

It will be observed that the core h is a screw-core, delivering the pipe automatically. The pipe is removed endwise by the extra speed of the revolving pressing-roller f and feeding-roller f' over the speed of the core, or by such other means as may be found convenient.

The degree of pressure required may be regulated either by the number of rollers or otherwise. The thickness of the pipe or sheet is regulated by the bevel or inclination of the pressing-rollers from the core, (see Fig. 2,) so that each sheet of fiber is spread on the revolving core from the inside to the outside through the whole thickness of the said pipe or sheet.

To make a sheet instead of a pipe, an extra core, h' , is used at such a distance from the other as the size of the sheet may require. To make panels, moldings, or anything with irregular surfaces, pressing-rollers with like irregular surfaces are used, as shown at Fig. 4. Moldings of any shape, form, or configuration are thus easily made by their being placed on the frame B, and the softened fiber passed between them. The number of the heaters and rollers may be increased and regulated as found necessary or advisable, and the adhesive and preserving compounds are varied to suit the different applications of the fiber. Softened Grahamite or asphalt or pitch may be used as adhesive compound; but I do not limit myself to these.

It will be observed that the fiber is not manufactured into pulp as for paper, or into solid sheets; but the fiber is used at the point of its greatest strength, and is carried by the corrugated lines on the heaters and rollers in direct or waving but independent lines. It will be seen that the lower pressure-roller f' is placed on a movable pivot, x , and the opposite end is adjusted by the screw w to give it the necessary inclination or bevel.

$p p p$, Fig. 2, are small rollers placed under the pipe as it runs off the screw-core h , to assist in carrying it endwise while being made. The line $o o$, Fig. 1, shows the course of the fiber from

the cutters to the core h . On Plate 2, Fig. 9, is shown a rotating hollow cylinder, N, arranged within a case, M, and having connected at either end a steam-pipe, O, and an air-pipe, O'. This cylinder is perforated with a series of openings, and has its periphery provided with cutting-edges. The interior surface of the case M within which this cylinder rotates is also formed with spiral corrugations, ribs, or cutting-edges, S, the two combined and operating together in such a manner that the refuse wood, slabs, cord-wood, or other fibrous material prepared by means of a single chute and cutting-knife are fed to the cylinder over the platform y , and are disintegrated, divided, seasoned, and reduced therein between the periphery of the rotating cylinder and the interior surface of the case. The essential feature of this last-mentioned arrangement is that I combine in the same rotating cylinder a centrifugal drying-cylinder for expelling the sap and water, a heating-cylinder, and a disintegrating-cylinder, by which means much space, time, power, and heat are saved, and the expense of the machine and its operation reduced. By means of the pipes O O' steam or hot or cold air can be introduced into the rotating cylinder and forced through the same out through the perforations; hence a rapid and thorough disintegrating and drying process is obtained by one and the same combined operation. In Fig. 10 of plate 2 is shown a double core, composed of conical sections Z z working between the pressing-rollers T T'. The design of such is to manufacture irregular-shaped vessels, such as buckets, &c., out of the before-mentioned materials; the bottom of the vessel being first placed between the sections of the core, the rind or rim being afterward formed around it between the irregular pressers or the bottom, can be formed at the same time by supplying the fibrous material, &c., directly to it; while in making uniform round vessels they are cut from the continuous pipe manufactured as aforesaid, and bottomed from sheets of the said material inserted afterward.

The advantages attending the use of my improved art or process as above specified and described are many, a few of which may be enumerated as follows: First, the work of the saw-mill, dry-house, planing-mill, and a large share of the labor of the carpenter and painter, are completed in one operation, making from refuse waste timber or other woody fiber an article far superior to that made from the best of timber. Second, converting the vast quantity of wood and other fibrous material thrown aside as useless into superior building materials and articles hereinbefore mentioned. Third, building materials as manufactured by this process or art are vermin-proof, frost-proof, water-proof, fire-proof, non-conductors of electricity and sound; and houses finished with this material will be more easily heated, healthy, comfortable, and durable in every respect. Fourth, the operation of lathing, plastering, and papering houses may be dispensed with, and their place supplied by sheets manufactured as above described, and the flooring may be laid down in one piece, if necessary,

and the same will effectually resist the action of frost, cold, wind, or dampness. Fifth, in the construction of buildings there will be no open joints, as the material neither expands nor contracts.

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

1. The process of disintegrating, dividing, reducing, and seasoning refuse or other wood or fibrous matter for the purpose of forming the same into various articles of manufacture.

2. Woodphalt, produced by disintegrating, dividing, reducing, and seasoning the fiber of refuse or other wood or fibrous matter, and afterward compressing the same for the purpose of affording ready material for manufacturers.

3. The combination of the steam-chest A, chamber L, chutes *n n*, and cutters, arranged and operating substantially as described.

4. The endless apron *u*² arranged between each of the cutters, as described, in combination with the chutes *n n*, steam-chest A, and the heating-cylinder F, substantially as described.

5. The alternate pressing and oscillating rollers *d d*, in combination with the rotating steam-cylinder F, apron *u*², and cutter *a'*, substantially as and for the purpose set forth.

6. The automatic-delivering screw-core *h* arranged so as to produce continuous pipe, substantially as described.

7. The double automatic-delivering core *h h'* arranged so as to produce a continuous sheet for roofing, flooring, &c., substantially as described.

8. Embossed or ornamental surfaces produced out of the material hereinbefore described, by means of revolving pressing-rollers geared together, and having irregular, corrugated, embossed, ornamental, or varied surfaces.

9. The case M, provided on its inner surface with spiral guides or ribs *s s*, in combination with a rotating cylinder, N, chute *n*, and cutter *a'*, substantially as described.

10. The combination, in one and the same cylinder, of a centrifugal drying-cylinder for expelling the water or sap, a rotating heating-cylinder, and a rotating disintegrating-cylinder, substantially as and for the purpose set forth.

11. The rotating drying, heating, and disintegrating-cylinder formed with a series of perforations, in combination with case M, substantially as described.

12. The pipes O O' and case M, in combination with the rotating centrifugal drying, heating, and disintegrating-cylinders N, operating substantially as described.

13. The double conical-shaped core, composed of the sections Z *z*, arranged and operating in connection with the presser-rollers T T', substantially as described.

To the above I have signed my name this 15th day of September, 1871.

JAMES KENT GRIFFIN.

Witnesses:

JAMES L. NORRIS,
WM. J. PEYTON.

(125)