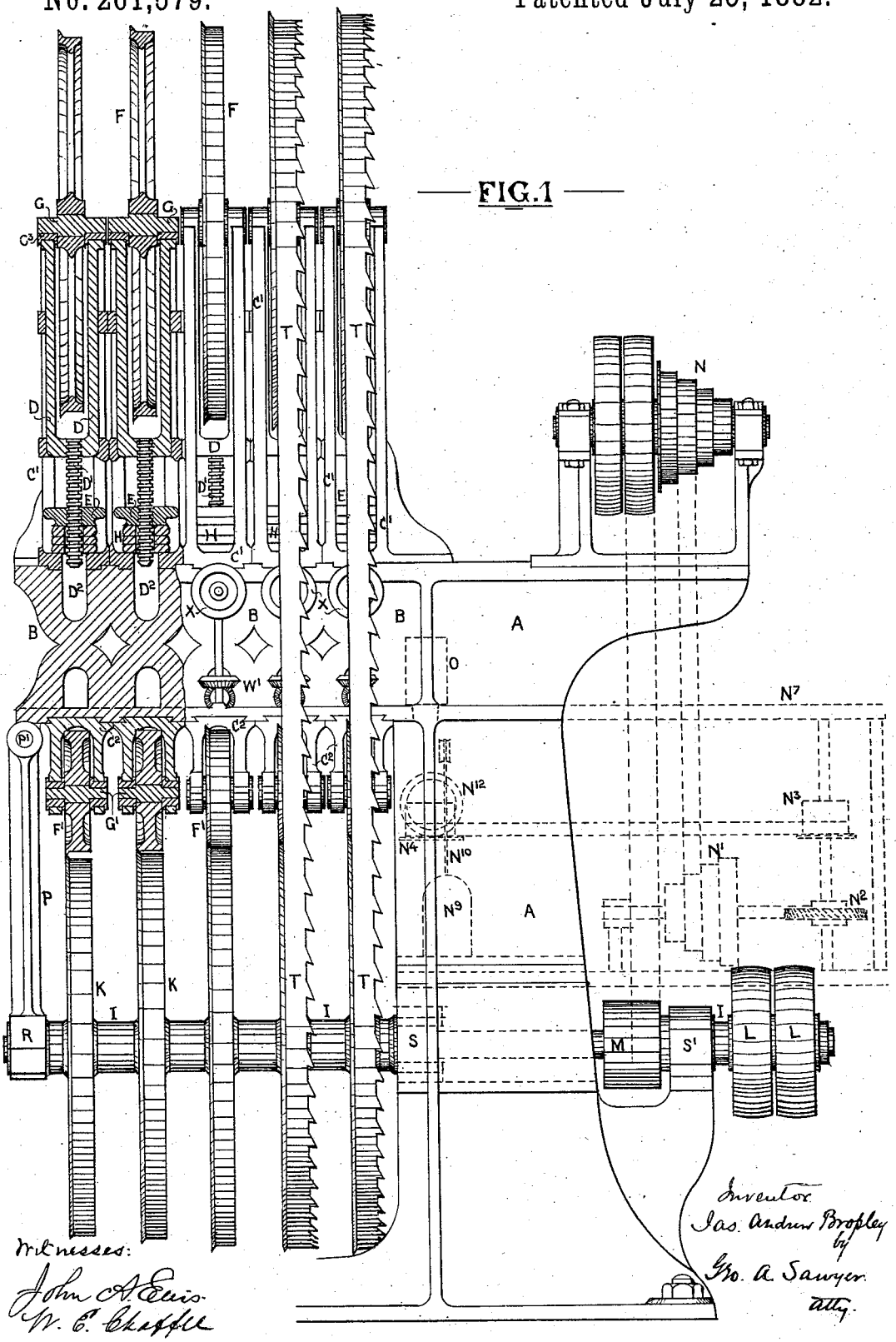
(No Model.) 3 Sheets—Sheet 1.

J. A. BROPHY.

BAND SAWING MACHINE.

No. 261,579. Patented July 25, 1882.

FIG. 1



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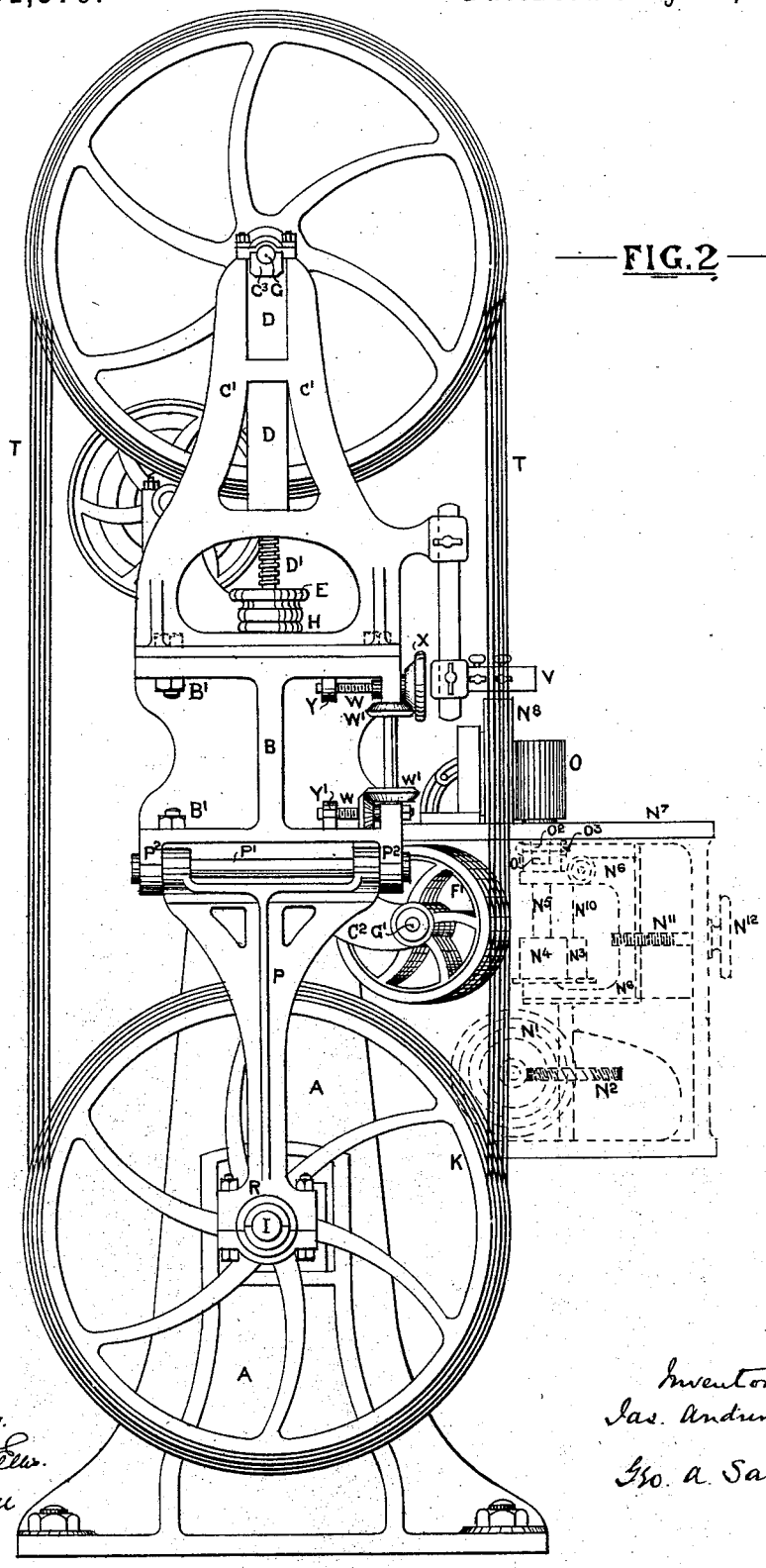
(No Model.) 3 Sheets—Sheet 2.

J. A. BROPHY.

BAND SAWING MACHINE.

No. 261,579. Patented July 25, 1882.

FIG. 2



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(No Model.) 3 Sheets—Sheet 3.

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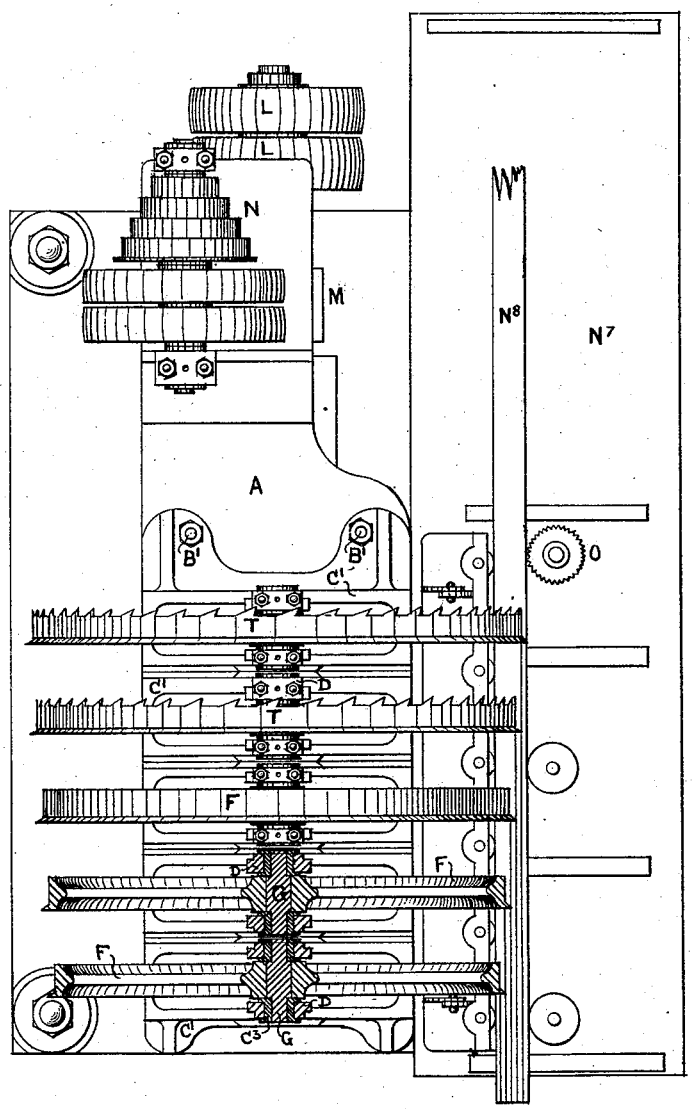
BAND SAWING MACHINE.

No. 261,579. Patented July 25, 1882.

FIG. 3



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UNITED STATES PATENT OFFICE.

JAMES A. BROPHY, OF CHELSEA, COUNTY OF MIDDLESEX, ENGLAND.

BAND SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 261,579, dated July 25, 1882.

Application filed October 11, 1880. (No model.) Patented in England September 22, 1879, No, 3,797.

To all whom it may concern:

Be it known that I, JAMES ANDREW BROPHY, of Chelsea, in the county of Middlesex and Kingdom of Great Britain, have invented certain new and useful Improvements in Band Sawing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings and the letters of reference marked thereon, which form a part of this specification.

This invention consists in certain arrangements of machinery or apparatus whereby a series of endless band-saws—placed contiguous to but entirely separate from and independent of each other as to tightening, changing, lengthening, shortening, or repairing the saws—are so employed as to combine the speed and continuous cutting action of band-saws with the advantage of number and variation of thickness of boards or leaves of timber or other material cut attainable by ordinary reciprocating saw-frames, but with the expenditure of much less motive power.

In the drawings, Figure 1 represents a front elevation, partially in section; Fig. 2, a side elevation, and Fig. 3 a plan of one arrangement of machinery constructed in accordance with my invention.

A is a strong cast-iron standard, with which is cast or to which is firmly bolted, as may be preferred, a strong arm or bracket, B. This bracket is planed parallel on top and bottom surfaces, and grooved transversely to receive on the top side the double guide-brackets C′ and on the bottom side the brackets C^2.

The double guide-brackets C′ are planed and grooved to receive and guide vertically the shackles D, which are adapted to fit into them. The shackles are fitted at their upper ends with gun-metal or other suitable bearings, C^3, adapted to receive the axles G, which are fixed in the saw-pulleys F. The lower ends of these shackles are made solid and provided with screwed spindles or tail-pieces D′, which project downward, passing through the bases of the guide-brackets C′ into the spaces D^2 in the bracket B. The screwed spindles or tail-pieces D′ are provided with wheel-nuts E, resting upon india-rubber or other suitable springs, H, which bear against the bases of the guide-brackets C′. When certain fixed thicknesses only are required the shackles D may all be carried through and adjusted in a second bracket, parallel to the bracket B.

The lower pulleys, K K, which are by preference similar in size to the corresponding pulleys above, are secured by a feather-key or otherwise upon the main shaft I, so as to be driven thereby when the latter is caused to revolve by a driving-belt applied to the fast and loose pulleys L L.

The shaft I is carried in bearings S and S′ in the standard A, the outer end being carried by a bracket, P, with suitable bearings, R, at its lower end. This bracket P is swiveled on a center-pin, P′, to lugs P^2, cast to or fixed upon the bracket B, whereby the said bracket P may be easily swung out of the way when it is required to change the pulleys K.

The saws T are stretched vertically on each pair of pulleys and tightened up by means of the wheel-nuts E. They pass through movable guides V, arranged in the usual manner, so as to form a kind of box with a hard-wood bottom or otherwise, and with ordinary hemp or other suitable saw-packing above for lubrication.

The alteration or adjustment of the thickness of the stuff to be cut is effected in the following way: Each of the brackets C^2 carries a guide-pulley, F′, the fixed axle G′ of which revolves in bearings in the said bracket. Each pair of brackets C′ and C^2, being adapted to slide transversely across the bracket B in the grooves prepared to receive them, is caused to do so simultaneously to the extent required to determine the thickness of stuff to be sawed, by means of the screws W, which take into the lugs Y and Y′, formed on or screwed to the brackets C′ and C^2, respectively. Each pair of these screws is geared together so as to turn simultaneously and to the same extent by means of the bevel-gearing W′, operated by the hand-wheel X. It will now be readily understood that on turning any one of the hand-wheels X in the requisite direction the corresponding pair of brackets C′ and C^2 is drawn out or pushed back, as may be required, and with them the guides V, together with that part of the saw-blade which extends between the saw-pulleys F and the guide-wheels F′.

When the adjustment is satisfactorily completed the brackets C′ and C² may be secured firmly to the bracket B by the tightening bolts and nuts B′.

M is a pulley on the main shaft I, which drives by a strap the cone-pulleys N′, whereby the rate of feed may be regulated to suit various materials, as required.

The cone-pulley N′ carries a worm which gears into the worm-wheel N² on the vertical shaft carrying a strap-pulley, N³, a strap from which drives the pulley N⁴ on the vertical feed-shaft N⁵, which carries at its upper end the grooved or toothed feed-roller O. This shaft is mounted in a movable bracket or head-stock, N⁶, adapted to slide transversely in guides below the table N⁷, being drawn toward the material to be cut, N⁸, by the action of the weight N⁹, exerted through the cord or chain N¹⁰.

When it is required to withdraw the pressure of the feed-roller O from the material to be cut, N⁸, the screw N¹¹, which takes into a nut in the movable head-stock N⁶, is turned by means of the hand-wheel N¹², and draws the said head-stock backward away from the material, raising the weight N⁹. On turning the screw N¹¹ in the opposite direction the head-stock and feed-roller O are drawn by the weight N⁹ toward the material to be cut. The feed-roller O is provided with a tapered stem, O′, adapted to fit into a recess in the head of the upright shaft N⁵, being secured therein by the taper key or cotter O², tightened up by the nut O³. By these means the feed-rollers may be changed to vary the speed of feed and to suit the shape of the material to be cut.

In the drawings the saw-pulleys are shown of various sizes suited to the production of boards or leaves of certain thicknesses, the centers of the upper set of pulleys being in the same vertical plane; but, as explained above, the thicknesses may be regulated more or less by moving out or in one or more of the brackets C′ C² by means of the gearing W and screws W′; or the lower set of saw-pulleys may be of various diameters, approximating more or less to those necessary to produce the required thicknesses of boards or leaves, while the upper set of saw-pulleys may be all of one diameter, but their outer peripheries adjusted to the proper positions for sawing to the required thicknesses by moving the brackets C′ and C² in or out to the required extent.

In some cases the gearing W′ may be dispensed with, and the brackets C′ and C² adjusted separately and independently of each other by the aid of screws alone or otherwise.

The machines may be adapted to work with the saws running horizontally or inclined, so as to flitch heavy timber or other material.

By arranging another bracket on the standard A parallel to and similar to B, with guide-brackets similar to C′ and C², with similar sets of saws and saw-pulleys, and a second main shaft similar to I, a double or any required number of cuts may be run at the same time in the same machine.

An alternative arrangement may also be effected by mounting two cone-drums on the same side of the standard, such cone-drums being formed of separate pulleys of different diameters, which may easily be changed on the drum-shafts to suit the thicknesses of sawing required, the upper set having the usual spring or lever and weight arrangements for general tension, and all driven by belt applied to the lower shaft, as in the arrangement first above described. The band-saws pass over these two sets of pulleys and over another set at the side of the frame, alternately arranged one higher and one lower to allow the saws to be placed quite close behind each other. Each of the pulleys comprising this third set is movable laterally for giving to each saw the required tension.

I am aware that band saws have been mounted upon head-pieces capable of lateral and vertical motion, and also that a means of adjusting the thickness of the lumber sawed by means of action on the saws has been known, and I do not claim such; but

What I do claim is—

1. The combination of the adjustable double guide-brackets C′, carrying the adjustable set of saw-pulleys, with the guide-brackets C², carrying the guide-rollers F′, with the connecting-gearing W′ for the purpose of adjusting the saw-blades into position for regulating the thicknesses of the timber or other material to be cut, substantially as described.

2. The herein-described improved band sawing-machine, having the top vertically and laterally adjustable pulleys, F, and the removable lower pulleys, K, held in place by the swinging bracket P, in combination with the guide-pulleys F′ and the adjusting means X W W′, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

JAMES ANDREW BROPHY.

Witnesses:

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