(No Model.)

E. BENJAMIN.

BAND SAW MILL.

No. 334,735. Patented Jan. 26, 1886.

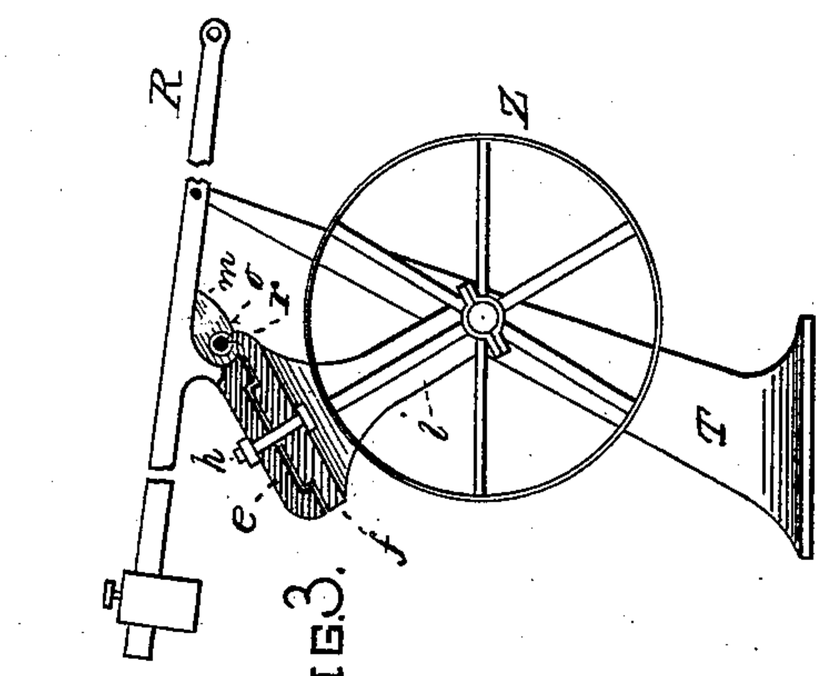

FIG. 3.

FIG. 4.

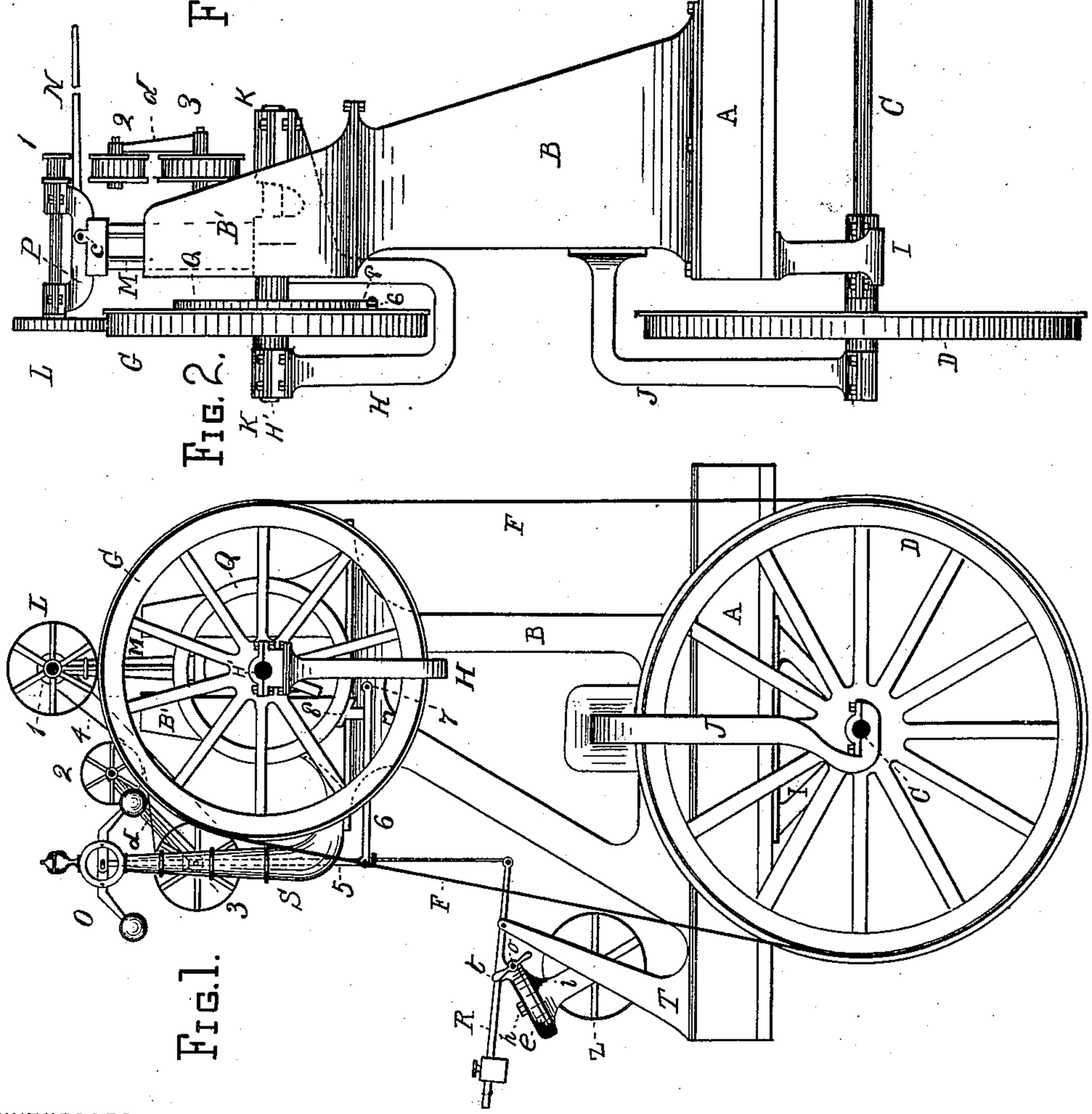

FIG. 2.

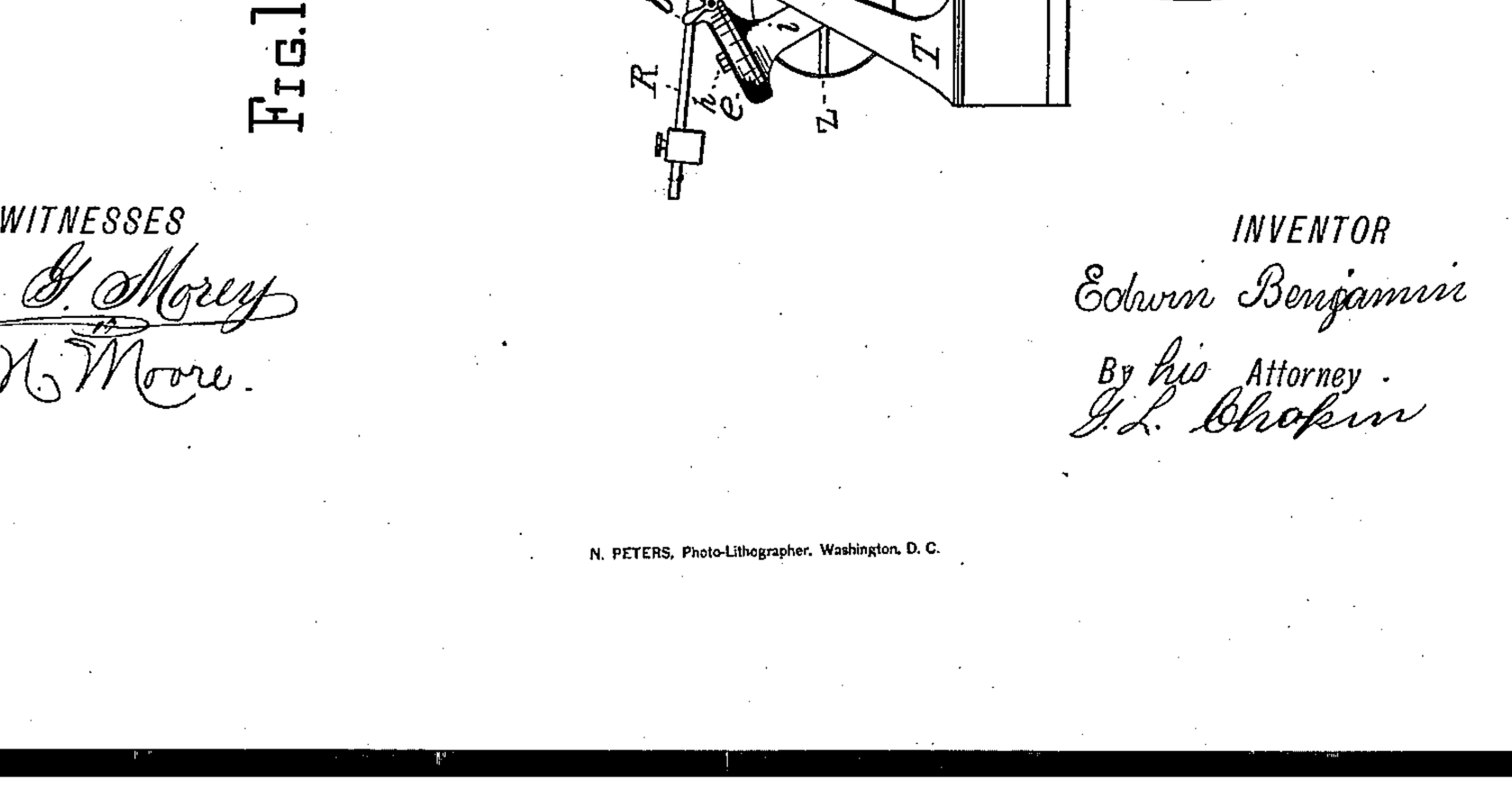

FIG. 1.

WITNESSES

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BAND-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 334,735, dated January 26, 1886.

Application filed March 13, 1885. Serial No. 158,752. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BENJAMIN, a citizen of the United States, and a resident of South Evanston, county of Cook, and State of Illinois, have invented new and useful Improvements in Band-Sawing Machines, of which the following is a specification, reference being had to the accompanying drawings, illustrating the invention, in which—

Figure 1 is an end elevation of a band-sawing machine embodying my invention; Fig. 2, a side elevation of Fig. 1; Fig. 3, an enlarged view of the saw-tension devices removed from the other parts; Fig. 4, an enlarged section of the rim of one of the band-wheels, showing the position of the wool felt and rubber for driving the band-saw.

The purpose of this invention is to provide more certain means for driving, tightening, and keeping band-saws from buckling.

The nature of the invention will be fully comprehended by the following detailed description.

A represents the base portion of the frame, and B B′ standards projecting up therefrom, the three parts supporting the mechanism, as follows:

C is a drive-shaft, which is hung under base A by hangers I J, and to it is attached drive-pulley W, and on the other end of the shaft is attached the lower pulley, D, which drives the band-saw F. The saw passes around this wheel D and over an upper "driven wheel," G, whose shaft H′ has bearings in boxes K, which are attached to a vertically-adjustable arm-support, H M, fitted to slide in the standard B′, the arm H M being adjusted by ordinary means now used for that purpose. The diameter of the driven wheel D, as compared with wheel G, is about in the proportion of eleven to eight—that is, that the wheel G shall not have such a momentum as to break the band-saw F in case its motion is suddenly retarded by any of the causes which often arise in cutting lumber; and to further attain this end the wheel G is made as light as possible and possess the requisite strength. This is an essential feature in the construction, and overcomes a serious objection to band-sawing. The wheels D G are so hung that the cutting portion of the saw is vertical, the same as where both band-wheels are of a like size. These wheels have had their peripheries covered with wood, rubber, leather, and cement composition, to furnish such a bearing-surface as to drive the saw and not take the set out of the saw-teeth.

So far nothing has been found which will not pack and get so hard as to take out the set of the teeth, or soon wear out, so as to serve a useful purpose but for a short time.

I have found by experiment that wool felt properly secured to the wheels by cement will serve the purpose much better than any article heretofore used, and also found that the wheel first covered with rubber and then with a band of wool felt for large machines serves still better the purpose, being very durable, and sufficiently flexible for the heaviest work.

At Fig. 4 is shown one of the wheel-rims in section, covered, first, with rubber, *b*, and then with a band of wool felt, *a*, the rubber being first cemented to the wheel, and the felt then cemented to the rubber. I use both the felt and rubber on large wheels, but in all instances use the wool felt. A wheel, L, is made to run on the saw F directly on the top of wheel G, and it is hung to a frame, P, which is pivoted to the support M at *c*, so as to have a tilting movement, by which the wheel is raised above the saw F. The purpose of this wheel is to operate a ball-governor, O.

The mechanism for connecting these parts consists of pulley 1 on the end of the shaft of the wheel L, pulley 3, hung to the governor-support S, and tightening-pulley 2, supported by a bracket, *d*, projecting out from the shaft of wheel 3. A belt, 4, is to be put over pulleys 1 and 3, and tightened by pulley 2, the wheel 3 being the ordinary motive power for driving the governor O.

To the vertically-reciprocating rod 5, to the governor O, is connected a brake-lever, 6, which is pivoted at 7 to the standard B, and provided with an ordinary brake-shoe, 8, to impinge on wheel Q, attached to the spokes of wheel G. This construction is such that by any retarding of the movement of the saw F by any additional labor it is to perform, the governor will put the brake to the wheel Q, and consequently retard the inclined portion of the saw to the same extent that the cutting part is retarded. The rod extends down and is jointed to a weighted lever, R, pivoted to a

standard, T, on the frame A. The lever is attached to a disk, *e*, which is flanged to a circular seat, *f*, and held together so as to turn by means of a connecting-bolt, *h*. A depending standard, *i*, from seat *f* is provided with a box carrying the shaft of a wheel, Z, and this wheel is made to engage the flat side of the inclined portion of the saw F, as an additional means to prevent the saw from buckling by putting the saw in greater tension. The further purpose of this wheel Z is to keep the saw on the pulleys, which is done by means as follows: On the disk *e* is formed a lug, *m*, in which is made a screw-eye to receive a screw-rod, *o*. An upwardly-projecting dod, *r*, on seat *f* engages the screw *o*, so that by turning the screw the face of the wheel Z is presented angularly to the flat side of the saw, and consequently keeps it up to the flanges on wheels D G. The screw is turned by means of any ordinary hand-lever, *t*, attached to one end thereof.

I claim as my invention—

1. In band-sawing machines, the friction-wheel L, hung to travel on the saw F on wheel G, and to be tilted from it by means of the tilting frame P, in combination with brake 6 8 and governor and rod O 5, whereby the brake is applied to retard the wheel G with a force graduated to correspond to the retarding movement of wheel L, to prevent the vertical portion of the saw from buckling, as specified.

2. The governor O, with its reciprocating rod 5, in combination with the lever R, which is hung to have an oscillating movement and bring the wheel Z, connected with lever R by means of the hanger *i* and disk *e*, to the inclined side of the saw F, and prevent any slack on the straight part of the saw, as specified.

3. The wheels D, G, and L, band pulleys or wheels 1 2 3, and governor O, with its reciprocating rod 5, in combination with the oscillating lever R, supporting the disk *e*, and the depending hanger *i*, arranged to turn on the disk and be held by means of a lug and screw, *r o*, to bring the inclined portion of the saw by means of the rotating wheel Z obliquely to the band-face of the wheels D G, and hold the saw to their flanges, substantially as specified and shown.

4. The wheels D G, faced with a band of wool felt, *a*, in combination with the saw F, as and for the purpose specified.

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Witnesses:
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