No. 834,958. PATENTED NOV. 6, 1906.

T. S. WILKIN.

GANG SAW MECHANISM.

APPLICATION FILED JAN. 7, 1904.

Fig. 1.

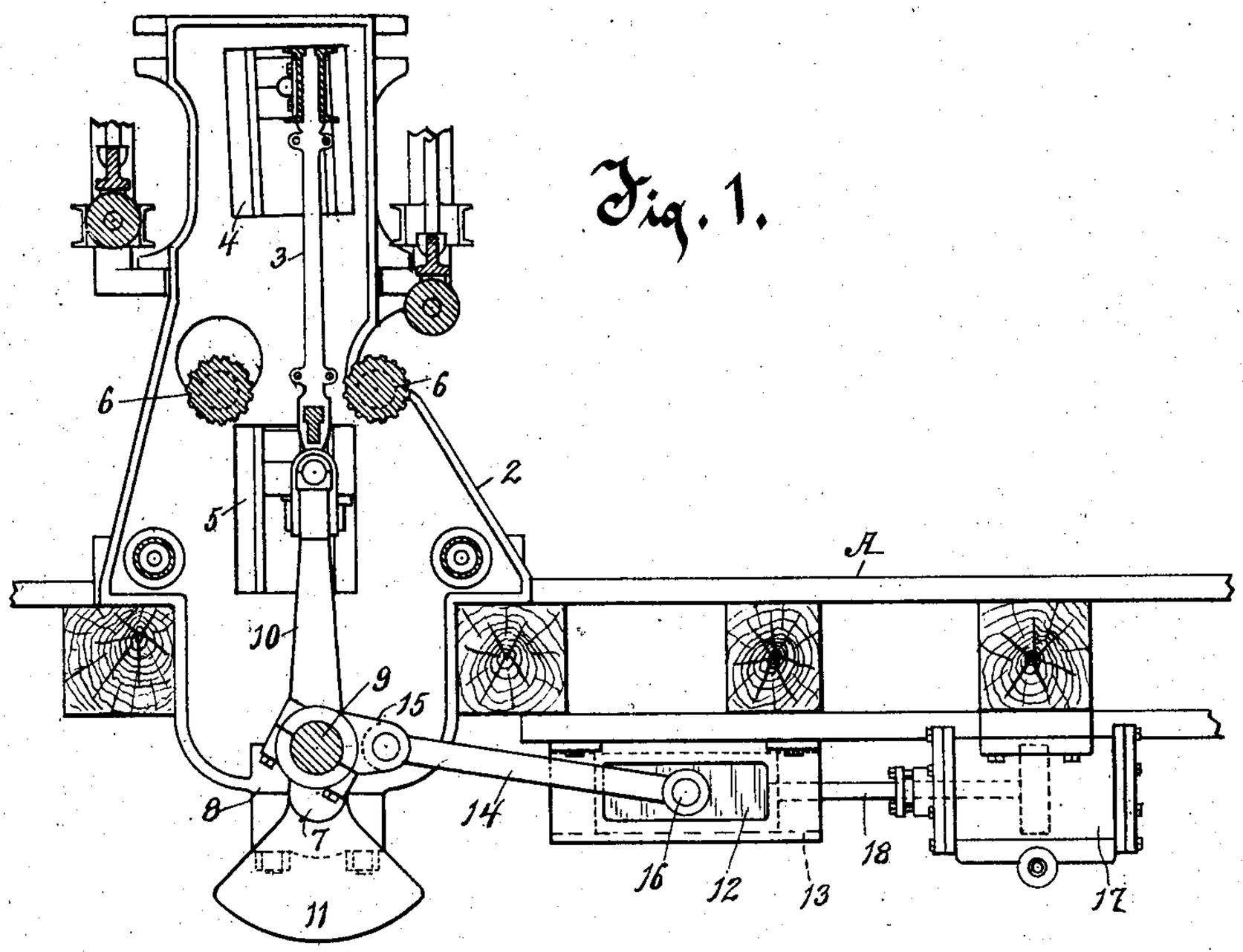
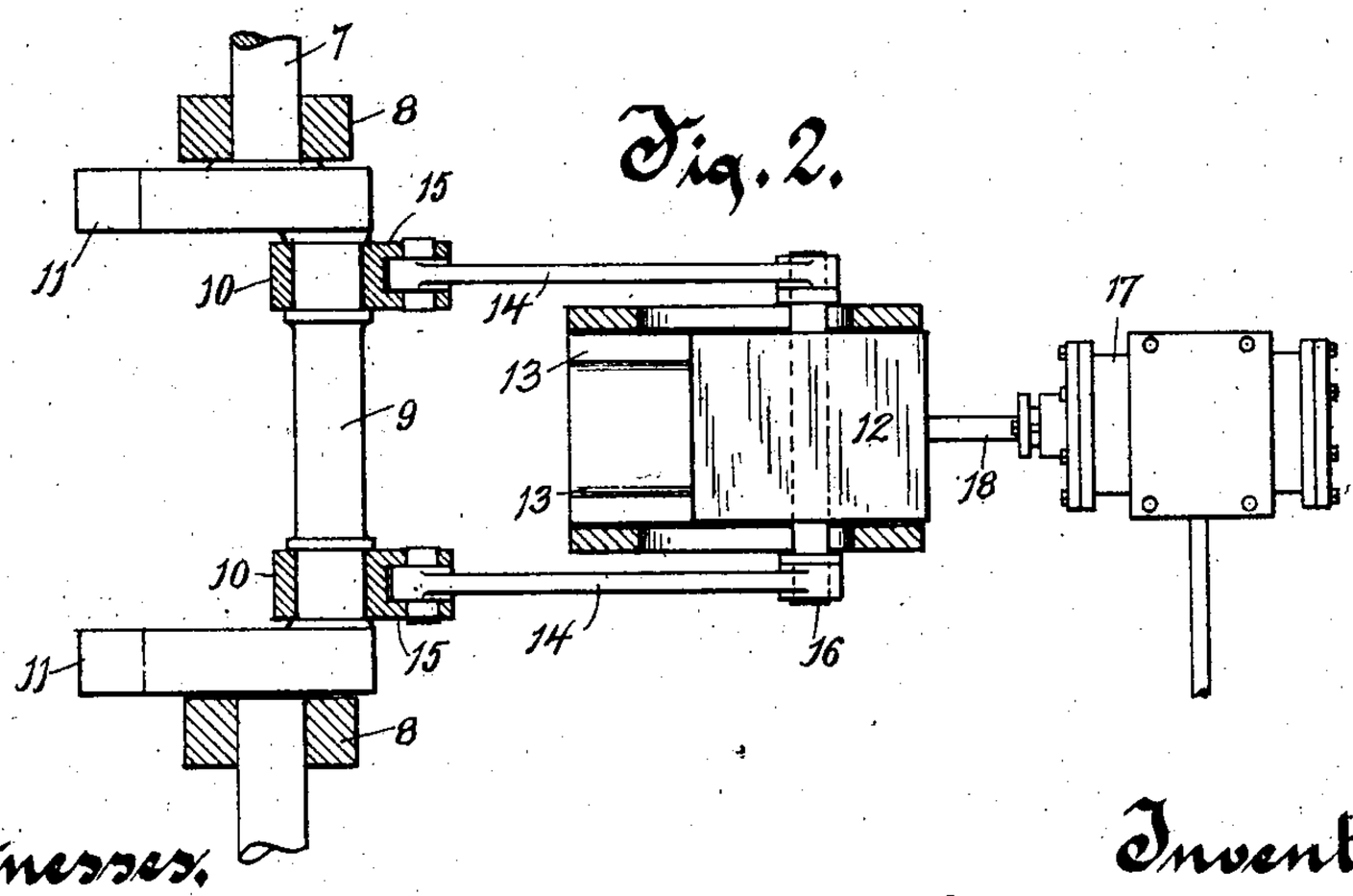


Fig. 2.



Witnesses.

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THEODORE S. WILKIN, OF MILWAUKEE, WISCONSIN.

GANG-SAW MECHANISM.

No. 834,958. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed January 7, 1904. Serial No. 188,015.

To all whom it may concern:

Be it known that I, THEODORE S. WILKIN, residing in Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Gang-Saw Mechanism, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The object of my present invention is to provide improved and more satisfactory means than has heretofore been employed in gang-saw mills to balance the gang-saw sash, including the saws therein and thereto-attached devices forming the load carried by the cranked shaft commonly employed for reciprocating the gang. By my improved construction the load on the cranked shaft, consisting of the gang-saw sash, its load, and the related parts, is so completely and adequately balanced in all its positions and at all times that shock or undue vibration of the mechanism is entirely obviated and a steady, even, and regular movement is secured in the use thereof.

My invention consists of the novel means and the parts thereof in combination, as hereinafter described and claimed, or the equivalents thereof.

In the drawings, Figure 1 represents a gang-saw-sash construction, partly in section, with which my improved means for balancing the same are shown and as thereto connected. Fig. 2 is a horizontal section of mechanism shown in Fig. 1 below the floor of the mill and exhibiting my improved construction.

The gang frame and sash as ordinarily constructed and operated require an essentially strong independent foundation to support them, because of the vibration and shock of the largely-unbalanced weight of the gang-sash and connected parts.

My improved construction is adapted to regulate and completely balance the momentum, vibration, and shock of the gang, and thereby to obviate the strain of the vibration and shock. This adapts the mechanism to be employed in a mill having an ordinarily strong frame and construction, as the gang frame and sash can be mounted thereon, thus obviating the necessity for an especially strong independent foundation as usually required to endure the vibration and shock of the unbalanced weight of the gang.

In the drawings, A represents the floor of a sawmill. The gang-frame 2, on which the gang-saw sash and related parts are mounted, may be supported on the mill-frame. A vertically-reciprocable gang-saw sash 3 is mounted to reciprocate up and down in sets of ways 4 and 5, which ways are on the gang-frame. The upper set of ways 4 are disposed slightly oblique to the perpendicular, so as to carry the top of the sash slightly forwardly on its down movement and rearwardly on its up movement. Material-supporting rolls 6 6 are mounted in the gang-frame in such position with reference to the path of the gang-saws as to properly support the material thereon and permit of its being suitably fed to the gang-saws. The gang-saw sash is reciprocated in the ways 4 and 5 by a driven cranked shaft 7, having bearings 8 8 in the gang-frame, the intermediate wrist 9 of the crank of the shaft being connected to the gang-saw sash by one or more pitmen 10 10. Constructions substantially like what has thus far been described are in common use.

As the gang-saw sash, with its saws and the pitmen 10 10, is supported on the wrist 9 of the cranked shaft 7, this weight, which may be called the "gang-saw" weight, is constantly shifting its position with reference to the longitudinal axis of the shaft 7, and as this weight is carried eccentrically on the shaft it produces a constantly-varying unbalanced strain, which being unbalanced would result in constant shocks, varying strains, and irregular movement of the mechanism. To overcome this, there is first provided one or more counterbalancing-weights 11 11, secured to the shaft 7 of such weight and projecting so far from the axis of the shaft and in the opposite direction to the gang-saw weight as is necessary to balance the gang-saw weight, and especially when the gang-saw weight is at or near the upper or lower limit of its travel. These weights 11 are advisably in sector form, as shown in the drawings; but this is not essential either as to form or satisfactory operation; but when in use as the shaft 7 is rotated, carrying the gang-saw weight up and down and swinging the counterbalancing-weights 11 around with it, the counterbalancing-weights have a constant momentum and centrifugal force as the weights approach the horizontal plane of the axis of the shaft and while passing that plane and beginning to recede therefrom that

is not balanced or met by the gang-saw weight on the opposite side of the axis of the shaft, because the gang-saw sash travels constantly substantially vertically in ways in the vertical plane of the axis of the shaft, and when the connection of the pitmen 10 to the crank by reason of their eccentric connection to the crank depart from the vertical plane of its axis the full weight of the gang-saw load is not thrown on the cranked shaft in such manner as to counterbalance the weight and centrifugal momentum of the weights 11, traveling constantly in the same circle about the axis of the shaft. To balance and thereby overcome this unequal side strain or unbalanced effort of the balancing-weights, I provide a lateral or secondary counterbalance which advisably may consist of a weight 12 in the form of a block of metal supported and slidable laterally in ways 13 therefor and connected by one or more rods 14, pivoted to the weight and conveniently to the lower portions or wrist-pin heads of the pitmen 10. The means for connecting such weight 12 to the wrist of the crank 7 is not important; but it is convenient to pivot the ends of the rods 14 in bosses 15, formed on the heads of the pitmen, and to pivot the rods on a pin 16, passing through the weight 12.

The ways 13 may be supported in any suitable manner, but may be conveniently constructed to be secured to the floor of the mill. The connection of the rods 14 to the wrist 9 of the shaft 7 should be substantially opposite the axis of the wrist and at a right angle to the radial plane of the center of the weights 11 from the wrist. This connection of the rods 14 to the wrist 9 of the shaft 7 is made in the construction shown in the drawings by connecting the rods directly to the lower ends of the pitmen 10, which are pivoted on the wrist 9. The construction is such that the weight or load 12 is put on the shaft 7 at a right angle radially to the counterweights 11, so that the counterbalancing effect of tnis secondary counterbalance 12 will be exerted chiefly on the mechanism in opposition to the centrifugal effort of the weights 11 when the weights 11 are at or near to the horizontal plane of the axis of the shaft. By this means the gang-saw weight and the weight and centrifugal momentum of the counterbalancing-weights 11 are completely counterbalanced, and a regular even motion is obtained practically free from vibration and shock.

The shaft 7 may be rotated by any convenient means, as by a band-pulley on the shaft with a band running thereon from a source of power or by a reciprocating piston connected to a crank on the shaft, and as the crank may be rotated by the method last suggested I have shown a form of construction that may be employed to rotate the shaft—a steam-cylinder 17, supported in horizonal position at the rear of the ways 13, the stem 18 of the piston of the cylinder being connected to the reciprocating block or weight 12, the block being thus made to serve as a cross-head. By this means through the connecting-rods 14 the shaft 7 can be rotated, and the gang-saws thereby reciprocated, the secondary counterbalance being made to serve as a means through which to drive the gang-saws, thus obviating other or independent means.

What I claim as my invention is—

1. In a sawmill, a vertically-reciprocating gang-saw and sash, a cranked shaft, a pitman connecting the gang-saw sash to the crank of said shaft, a counterweight on the cranked shaft projecting radially therefrom opposite to the pitman connection to the crank, and a secondary counterbalance connected to the cranked shaft at a right angle to the radius of the first-enumerated counterweight and adapted to balance the centrifugal momentum of the counterweight as it passes the horizontal plane of the shaft.

2. In a gang-saw mill, a vertically-reciprocating gang-saw sash and related parts, a cranked shaft, a pitman connecting the gang-saw sash to the crank of said shaft, a counterweight on the cranked shaft opposite to the connection of the pitman to the crank of said shaft and adapted to balance the gang-saws and connected parts, and a secondary counterbalance connected eccentrically to said shaft in a radial line therefrom at a right angle to the radius of the counterweight thereon.

3. In a sawmill, a vertically-reciprocating gang-saw and sash, a cranked shaft, a pitman connecting the gang-saw sash to the crank of said shaft, a counterweight on the cranked shaft opposite to the connection of the pitman to the crank of said shaft and adapted to balance the gang-saw and connected parts and a secondary counterbalance comprising a weight, horizontally-disposed ways in which the weight is reciprocable, and a rod connecting the weight to the cranked shaft eccentrically in a radius to its axis at a right angle to a diametrical plane through the axis of the shaft the connection of the pitman to the shaft and the oppositely-disposed counterbalance.

4. In a gang-saw mill, a vertically-reciprocating gang-saw and sash, a cranked shaft, a pitman connecting the gang-saw sash to the crank of said shaft, a counterweight on the cranked shaft opposite to the connection of the pitman to the crank of said shaft and adapted to balance the gang-saw and sash, a secondary counterbalance consisting of a weight reciprocable horizontally in a suitable support therefor, a rod connecting the weight to the cranked shaft eccentrically in a radius to its axis at a right angle to a diametrical plane through the axis of the shaft the con-

nection of the pitman to the shaft and the oppositely-disposed counterbalance, and a horizontally-disposed steam-cylinder provided with a reciprocating piston and its stem connected to and adapted to reciprocate said secondary weight and its thereto-connected load.

5. In a gang-saw mill, the combination of a saw frame or sash and two counterbalancing devices operating in intersecting planes or paths, the first serving to counterbalance the saw frame or sash, and the second serving to counterbalance the first.

6. In a gang-saw mill, the combination of a saw frame or sash, a counterbalancing mechanism therefor, and a second counterbalancing device connected with and serving to neutralize the effect of the first counterbalancing mechanism in a path intersecting the path of movement of the saw frame or sash.

7. In combination with the main framework, sash and actuating mechanism of a gang-saw mill, a shaft provided with counterbalance-weights set to reach the downward limit of their throw as the sash reaches its highest point, and vice versa; a second counterweight movable back and forth in a given plane at substantially right angles to the plane of movement of the saw frame or sash, and connections between the first and second counterweights, whereby the latter is brought to its medial position when the first is at its highest and lowest points, and is moved inward toward the first when said first counterweight is on the same side of its carrying-shaft as the second counterweight and is moved outward therefrom as the first counterweight passes to the opposite side of its shaft.

In testimony whereof I affix my signature in presence of two witnesses.

THEODORE S. WILKIN

Witnesses:

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