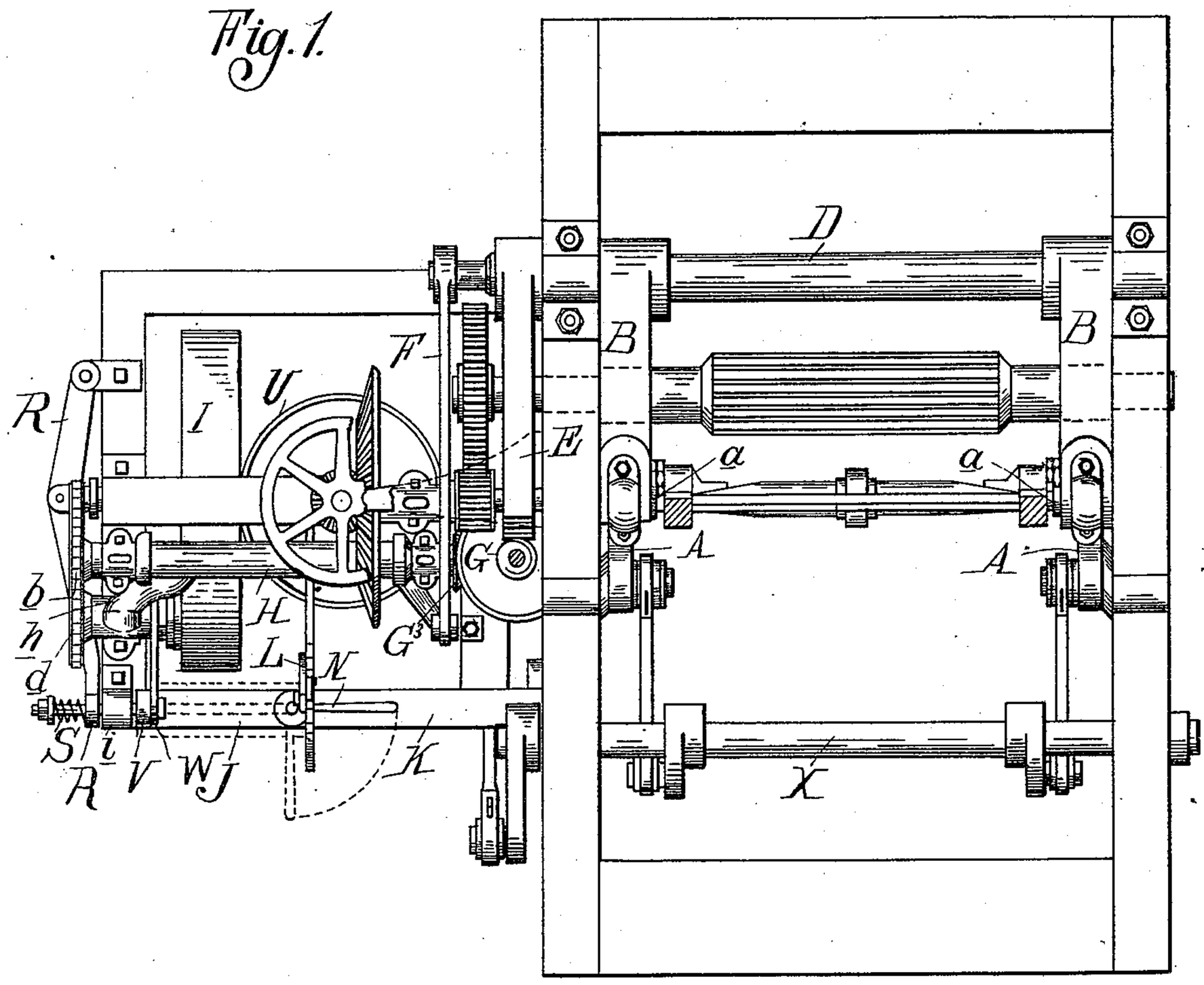
(No Model.) 5 Sheets—Sheet 1.

D. CRANE.

GANG SAW MILL.

No. 562,217. Patented June 16, 1896.

Fig. 1.



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(No Model.)

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Fig. 2.

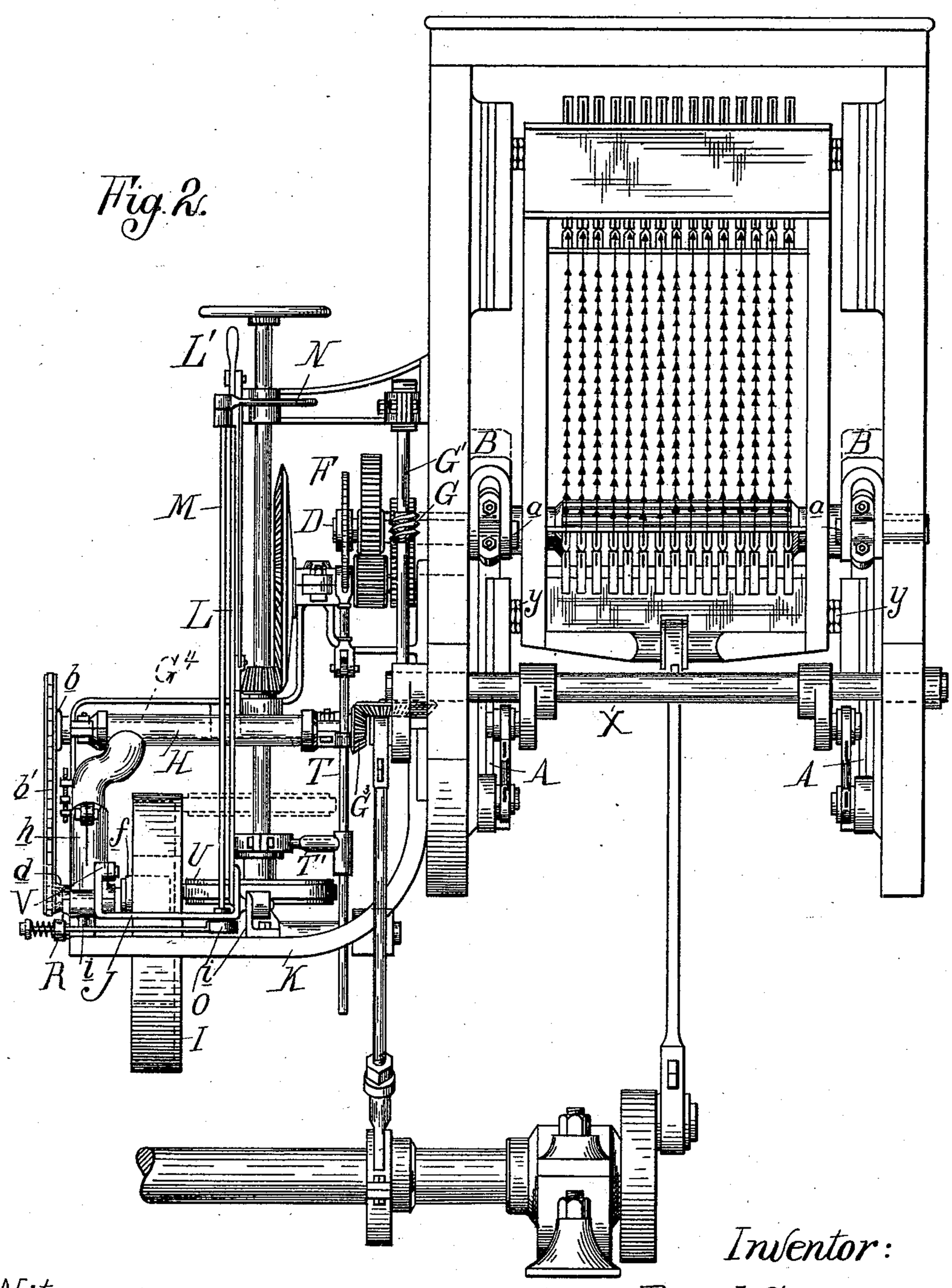

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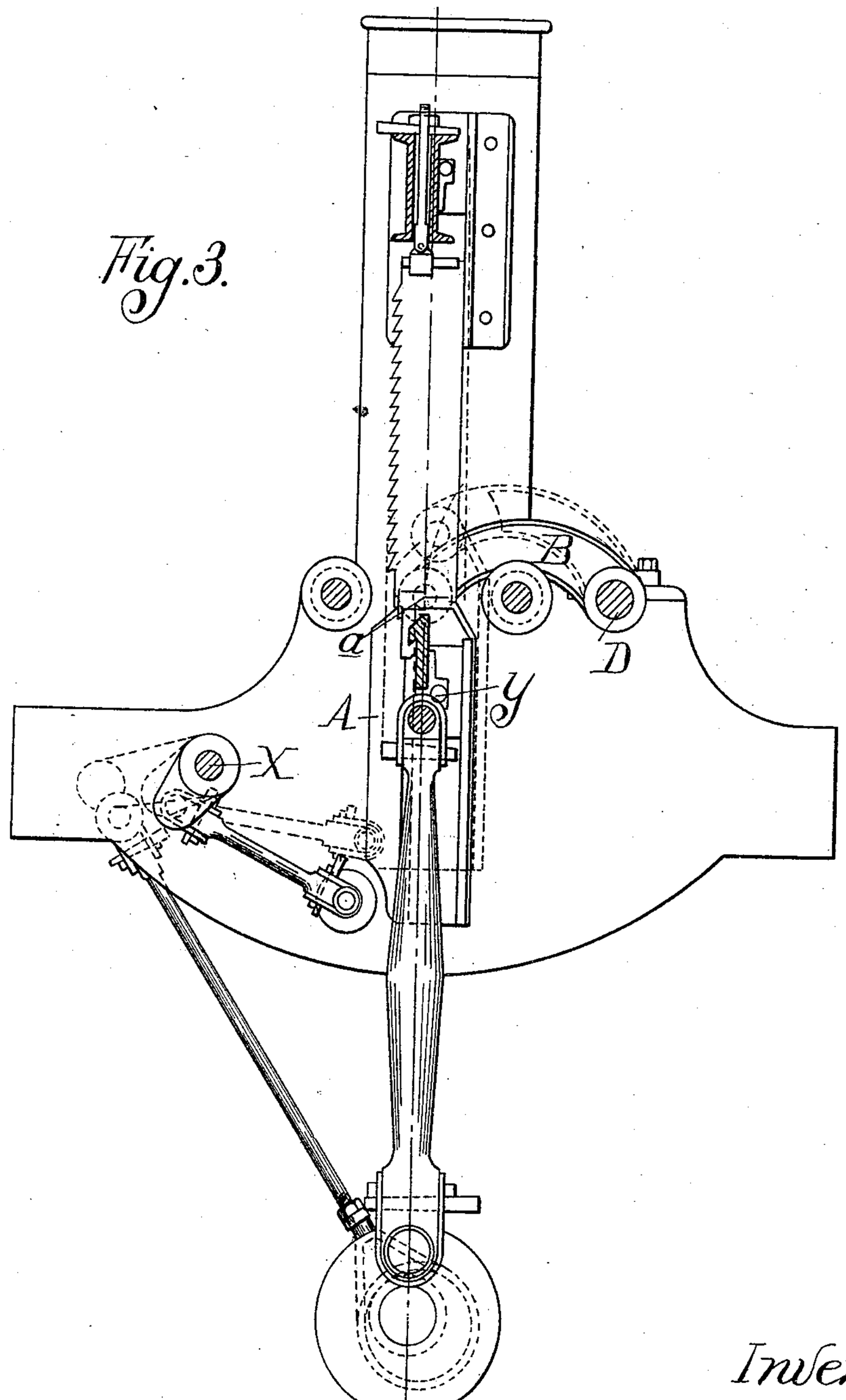
Fig. 3.



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(No Model.) 5 Sheets—Sheet 4.

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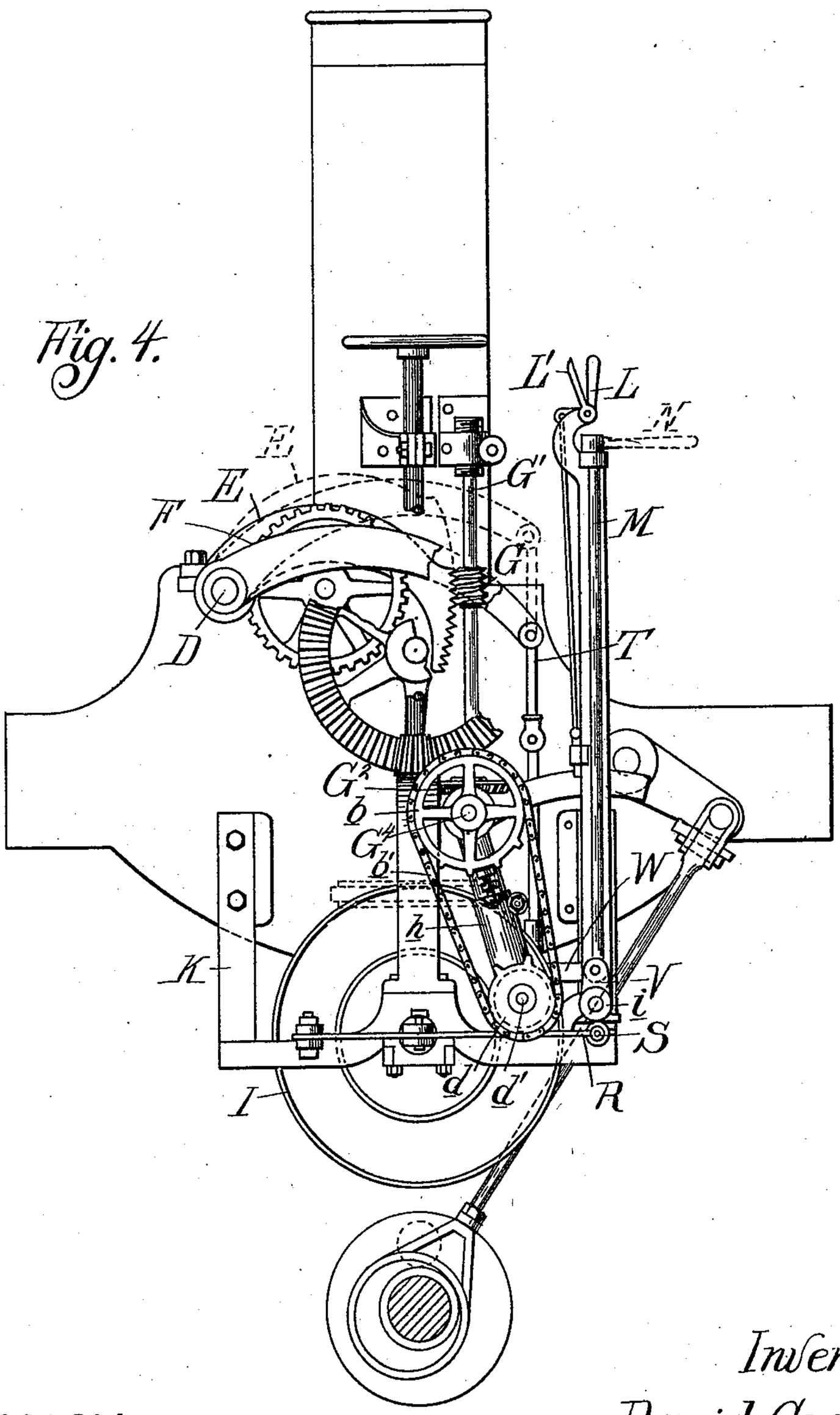
No. 562,217. Patented June 16, 1896.

Fig. 4.



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(No Model.) 5 Sheets—Sheet 5.

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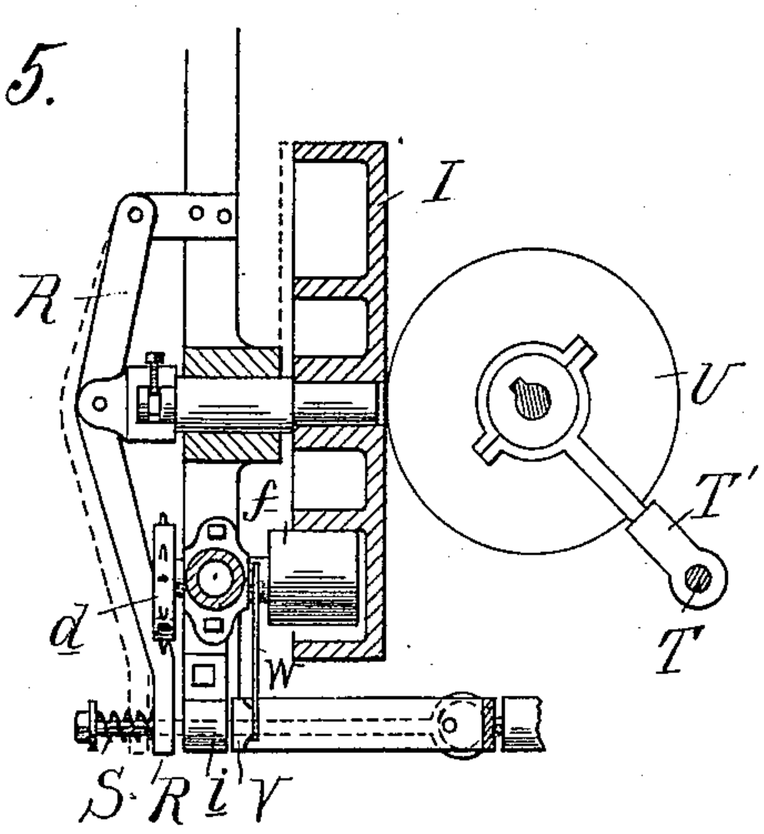
Fig. 5.



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UNITED STATES PATENT OFFICE.

DANIEL CRANE, OF SAGINAW, MICHIGAN.

GANG-SAW MILL.

SPECIFICATION forming part of Letters Patent No. 562,217, dated June 16, 1896.

Application filed November 12, 1895. Serial No. 568,696. (No model.)

To all whom it may concern:

Be it known that I, DANIEL CRANE, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Gang-Saw Mills, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a new and improved oscillation in gang-saws operated in conjunction with the feed, and the objects of my improvement are, first, to provide a variable reciprocating motion or throw to the saws; second, a variable overhang or rake to saws, and, third, a variable feed, all with one combination-lever which operates the whole, giving the saws the same contact with the timber, from the smallest to the greatest feed. I attain these objects by the mechanism illustrated in the drawings, in which—

Figure 1 is a plan of the machine. Fig. 2 is a front elevation of the machine; Fig. 3, a sectional elevation showing the oscillating parts of the machine. Fig. 4 is an outside elevation showing mechanism for operating oscillation and feed. Fig. 5 is a horizontal section through the combination-pulley I.

The saw-gate reciprocates as usual in slides, of which the upper ones are fixed, while the lower slides A A are pendulous by being secured to the arms B B, by means of the swing-pins *a a*. The arms B B are secured to a shaft D, which has its bearings secured to main frame of machine. The shaft D (see Figs. 1 and 4) is also provided with the quadrant-arm E and a lifting-arm F. The quadrant-arm E engages with a worm G, mounted on a strong spindle G′, (see Fig. 2,) which preferably is supported in pivot-bearings and near its lower end has the bevel gear-wheel G^2. This bevel gear-wheel G^2 meshes with a bevel-pinion G^3 upon a shaft G^4, (see Figs. 1, 2 and 4,) which passes through a hollow rock-shaft H and carries a sprocket-chain wheel *b* on its outer end. The sprocket-wheel *b* is connected by link belt or chain *b′* to a smaller sprocket-chain wheel *d*, which is provided with a shaft *d′*, on the opposite end of which is a small paper friction-wheel *f*. This shaft *d′* (with sprocket-chain wheel and paper friction-wheel) has its bearing in the end of an extension-arm *h*, formed in the hollow rock-shaft H. (See Figs. 1, 2 and 4.) The paper friction-wheel *f* projects into an annular recess of the combination-pulley I, (see Figs. 2 and 4,) which is so constructed as to form a pulley for receiving power by belt from gang-shaft or counter-shaft, also a face-plate for the variable-feed and opposite annular friction-surfaces for the small paper friction-wheel *f*.

J is a rocker-base which has its bearings in the small brackets *i i*, (see Figs. 1, 2 and 4,) which are secured to the frame-bracket K, which in turn is secured to main frame of gang. To this rocker-base J is attached the combination-lever L, Figs. 1, 2 and 4, to the side of which is attached the small shaft M, the upper end of which is provided with the lever-handle N, Figs. 1, 2 and 4, while its lower end passes through the rocker-base J and carries the small eccentric O, Fig. 2, having an eccentric-rod passing on the under side of rocker-base J and through the end of lever R, Figs. 1 and 4, and carrying upon its outer end the spring S, Figs. 1, 2 and 4. The lever L has a suitable latching device provided with the handle-lever L′ for holding it in its normal position.

The lifting-arm, Figs. 1, 2, and 4, has attached to its outer end a sliding rod T, Figs. 2 and 4, which has a bracket T′, that forms the bearing which carries the edge friction-wheel U, Figs. 1 and 2. The rocker-base J has also a short arm V, Figs. 2 and 4, which is connected to the extension-arm *h*, Figs. 1, 2, and 4, by the connecting-link W. A vibrating motion is imparted to the slides A in the usual manner by means of a rock-shaft X, which is actuated from the main shaft through any suitable connection and by a crank and pitman is connected to the lower ends of the slides.

In practice, the parts being constructed and arranged as shown and described, it will be seen that if the operator grasps the lever L and closes the hand over the latch to unlock the same, the lever is free to be forced in either direction, bringing the small paper friction-wheel *f* in contact with one or the other of the opposite annular friction-faces of the combination-pulley I, (which is supposed to be in motion,) causing it to revolve in either direction. This motion is trans-

mitted through the chain-gear *b* and *d* to the shaft G^4, which passes through the hollow rock-shaft H and gears with the spindle G′, which carries the worm G. Now if the worm G is revolving in the proper direction the quadrant-arm E will be raised and the arms B B, which carry the vibrating slides A A, will be raised with it and carried back, as shown in dotted lines in Fig. 3, giving the saws more overhang or rake. Simultaneously with the raising of the slides A A, which increases the rake, the throw or vibrations of the slides has also increased, as the slide-block Y now reciprocates in the slides in closer proximity to the connection with the actuating-pitman. Again, when the quadrant-arm E is raised the lifting-arm F, to which is attached the edge friction-wheel U, is also raised to the position shown by dotted lines in Fig. 2, giving an increase of feed simultaneously with the increase of throw and overhang or rake.

When the lever L is forced in the opposite direction, the feed, the throw, and the overhang or rake are simultaneously diminished. It will also be seen that the above conditions are controlled perfectly by the one combination-lever L.

The object of the small shaft M, attached to the combination-lever L, which has the small lever N on its upper end and small eccentric O on its lower end, is to start and stop the feed, as the lever R is suitably connected to the combination-pulley I to throw it in or out of contact with the feed-wheel U.

The position of small lever N in Fig. 1 shows feed on, and when thrown back, as shown by dotted lines, the feed is off.

Power is transmitted to the feed-rolls (over which the timber to be sawed passes) from the edge friction-wheel U by the gearing long in use in such machines.

I am aware that prior to my invention gangs have been made with oscillation operated in conjunction with the feed. I therefore do not claim such a combination broadly, but I am not aware that the rake of the saws, the amount of throw and the rate of feed have ever been adjusted simultaneously by the operation of one lever, which is an important improvemcnt and which makes it practical to use the very thinnest saws, by distributing the wear more uniformly on the teeth for the entire length of the saws in contact with the timber, thereby enabling the saws to remain sharp longer, with a result of less wear on saws and loss of time fitting same, at the same time putting the machine under perfect control of the operator, (by the one lever,) enabling him to advance or retard the movement of timber being sawed according to its resistance to the saws, the same as is the case with circular or band saws.

What I claim as my invention is—

1. The combination in a gang-saw mill of the lower oscillating slides A A, the rock-arms B B to which said slides are pendulously secured by swing-pins, the shaft D carrying the rock-arms, the quadrant-arm E on said shaft, the worm G with which said quadrant engages, actuating connection for said worm for imparting motion thereto at will in reverse directions, the lifting-arm F secured to shaft D and means operated by said arm for controlling the rate of feed, all substantially as set forth.

2. In a gang-saw mill, the combination with the feed mechanism and fixed upper slideways, of lower oscillatory slideways, rock-arms on a rock-shaft to which said oscillatory slideways are pivotally secured, means for imparting motion to said rock-shaft in reverse directions to raise or lower said oscillatory slideways, and a connection between said rock-shaft and feed mechanism adapted to correspondingly accelerate or retard the feed, substantially as described.

3. In a gang-saw mill, the combination with the feed-rolls, the oscillatory slideways and rock-arms on a rock-shaft to which said slideways are pivotally secured, of the combination-wheel I adapted to be drawn peripherally, one side thereof forming a face-plate friction and the other being provided with opposite annular friction-faces, a friction-wheel between said annular faces adapted to be moved into contact with either and to be driven thereby in reverse directions, connection between said friction-wheel and the rock-shaft and an edge friction-wheel in engagement with the face-plate friction forming a variable-speed drive connection for the feed-rolls, substantially as described.

4. The combination in a gang-saw of the rocker-base J and the combination-lever L having shaft M provided with the lever N, the eccentric O with its rod connected to lever R, all substantially as set forth.

5. The combination with the wheel I having opposite annular friction-faces and the oscillatory slideways pendulously secured to rock-arms on a rock-shaft; of the shaft G^4, the hollow shaft H sleeved thereon having the extension-arm *h*, the friction-wheel *f* journaled at the end of the arm *h*, between the opposite annular faces of the wheel I, a sprocket-and-chain connection between said friction-wheel and the shaft G^4, a drive connection between said shaft and the rock-shaft, and means for moving said friction-wheel *f* at will into contact with one or the other of said annular faces, substantially as described.

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

DANIEL CRANE.

Witnesses:
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O. F. BARTHEL.