(No Model.) 4 Sheets—Sheet 1.

G. W. MASON, N. SHAW & G. H. HOPPER.

SAWING MACHINE.

No. 453,598. Patented June 2, 1891.

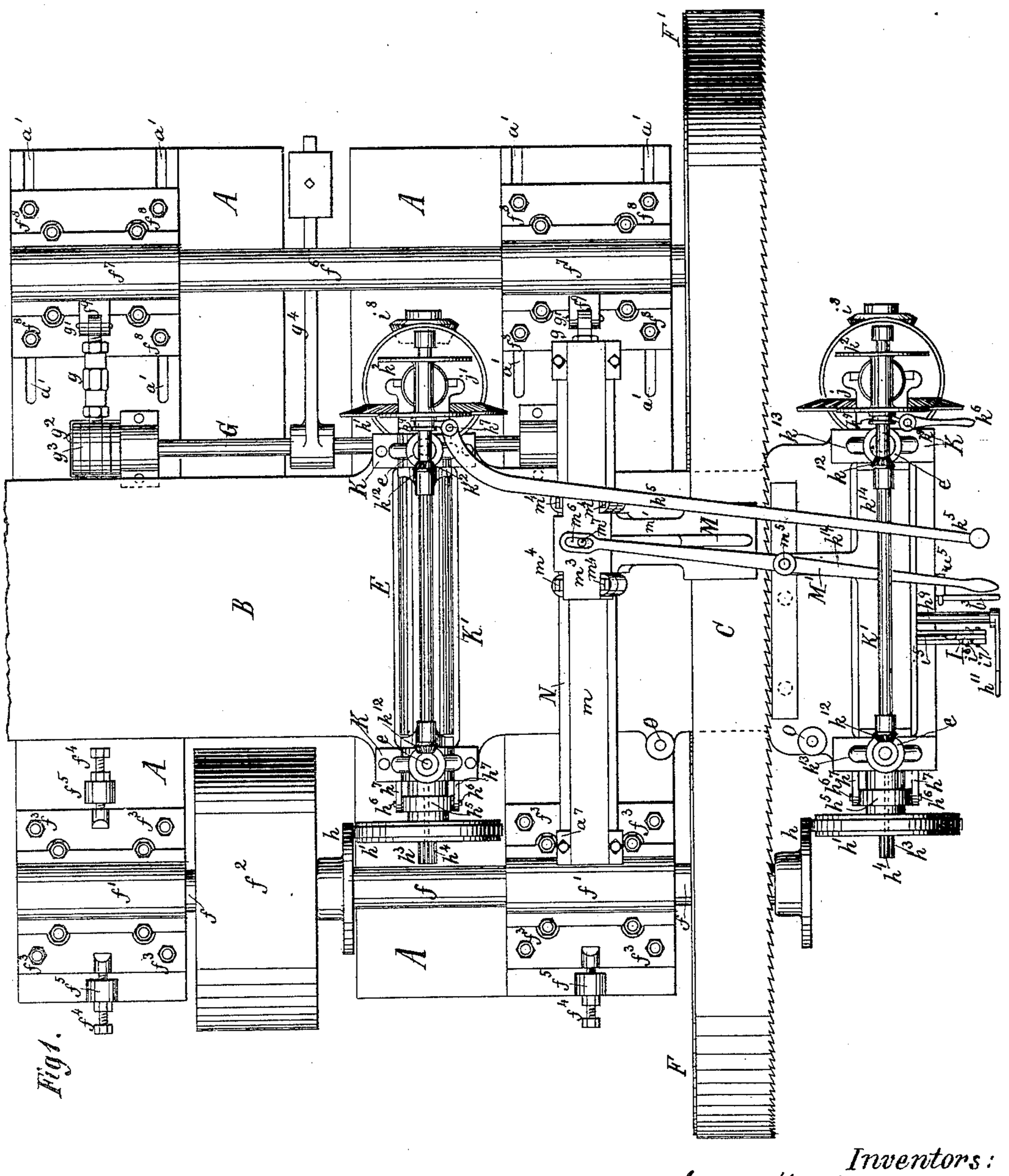

Fig 1.

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(No Model.) 4 Sheets—Sheet 2.

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Fig 5.

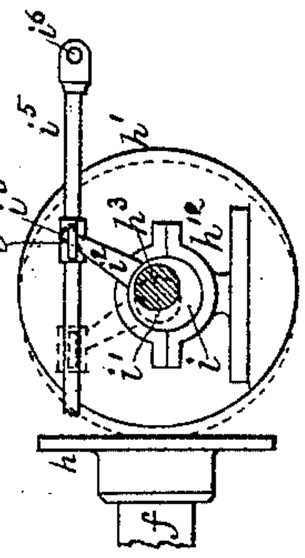
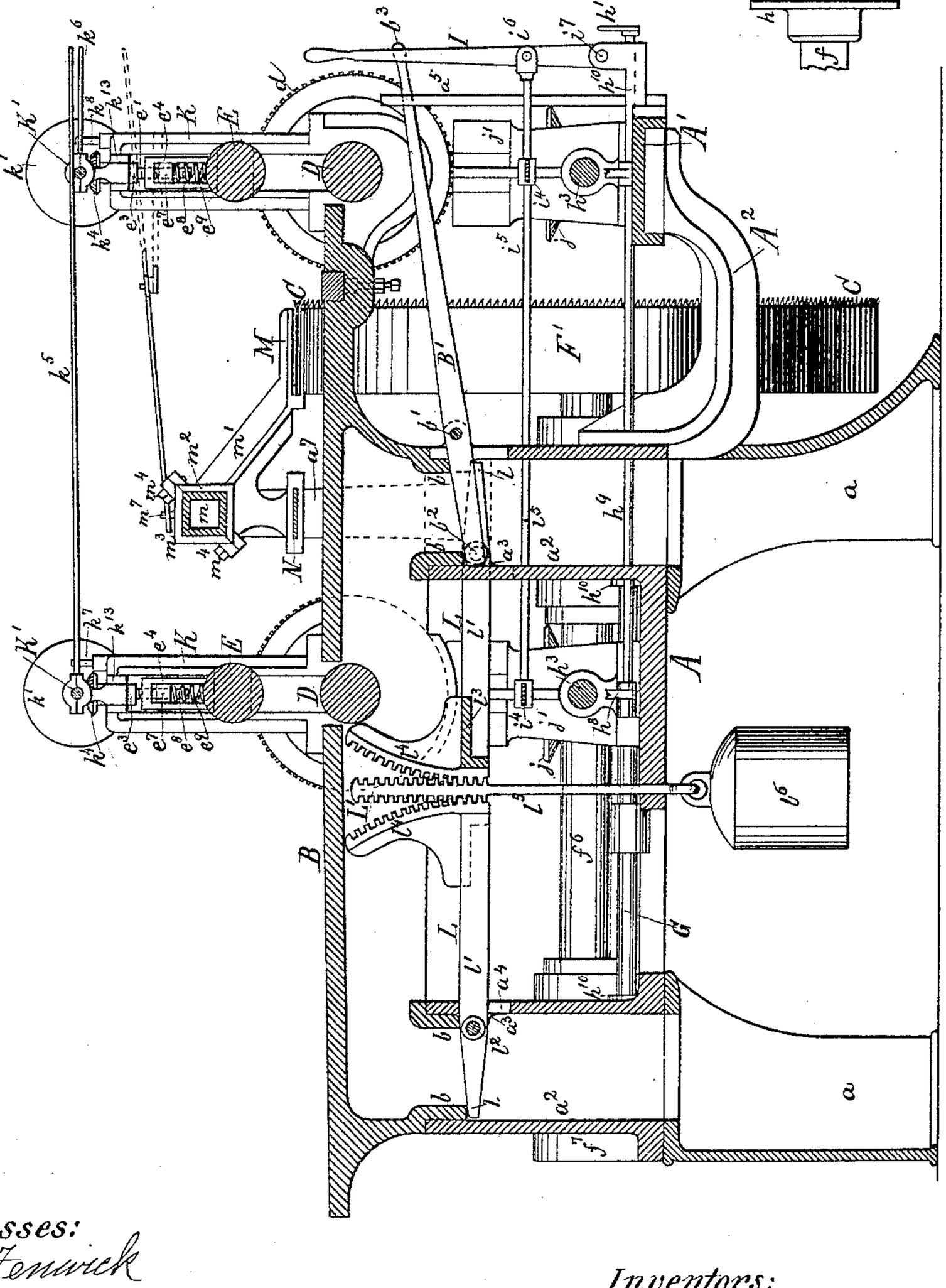


Fig 2.



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(No Model.) 4 Sheets—Sheet 3.

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SAWING MACHINE.

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Fig 4.

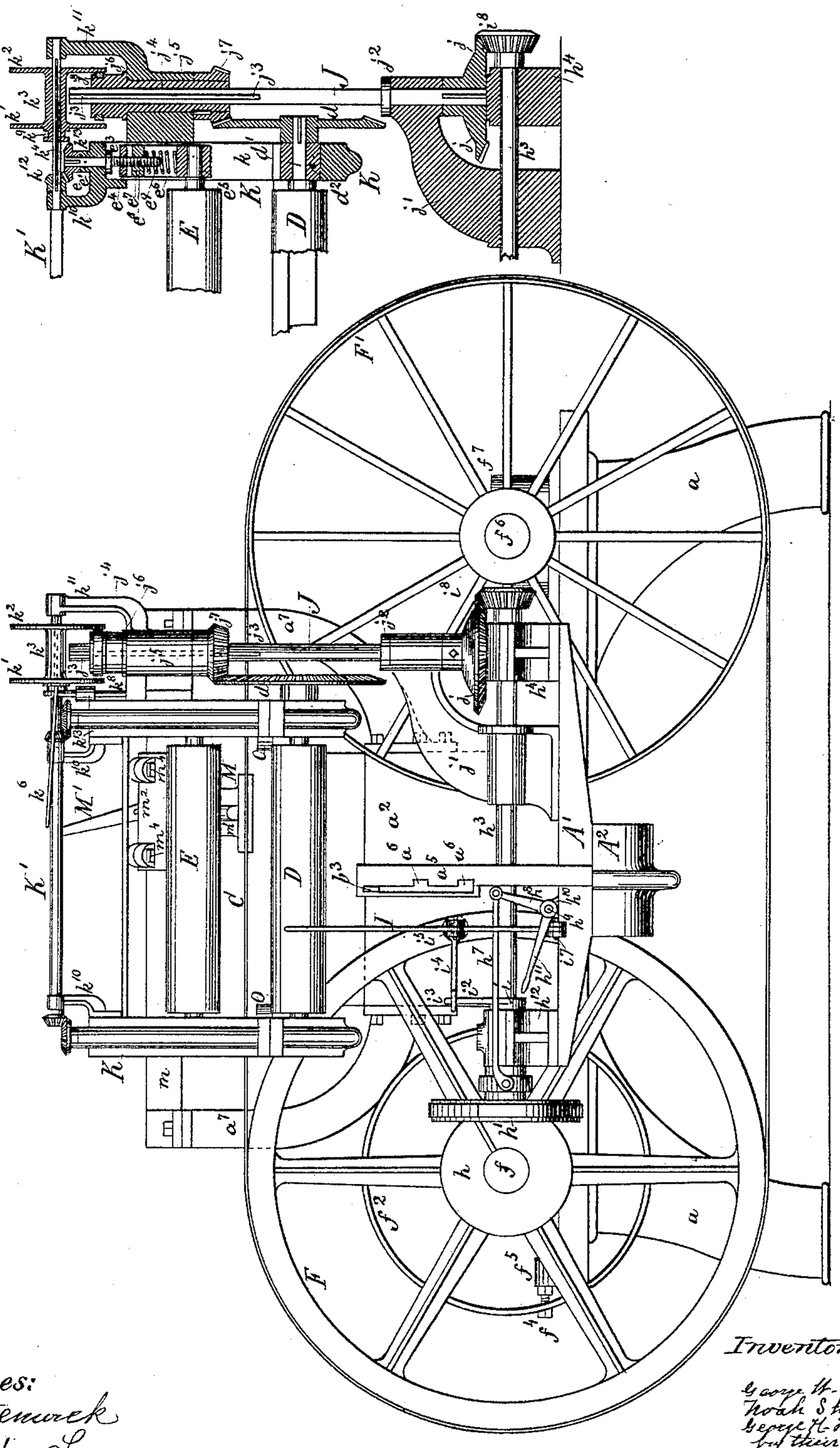

Fig 3.

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G. W. MASON, N. SHAW & G. H. HOPPER.

SAWING MACHINE.

No. 453,598. Patented June 2, 1891.

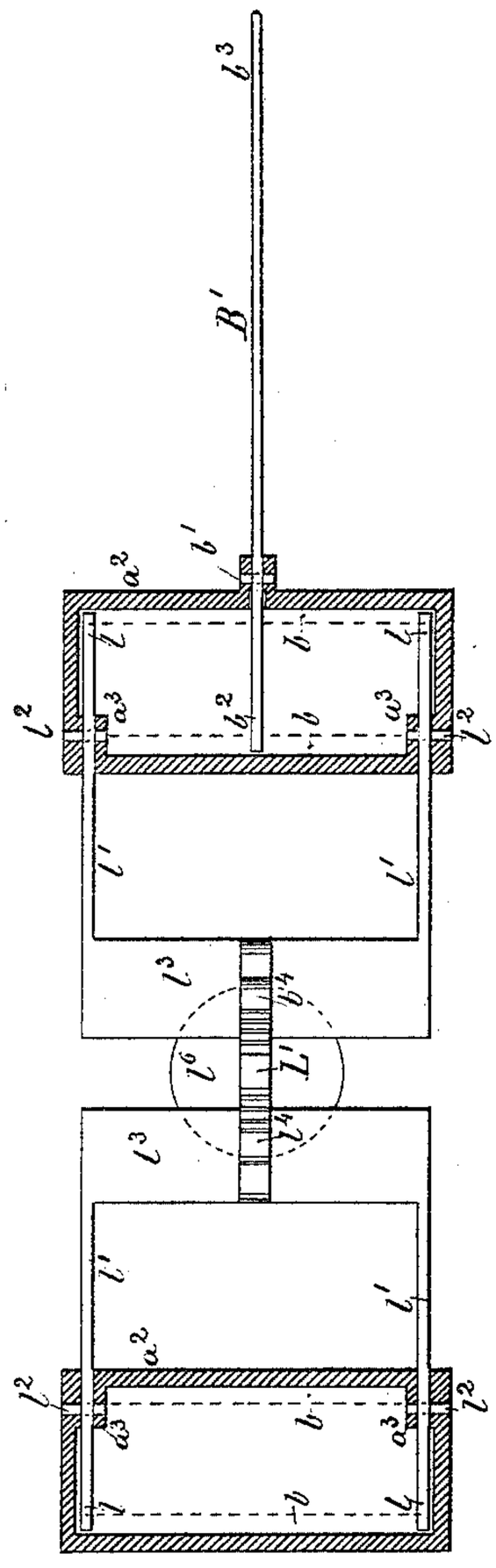

Fig 6.

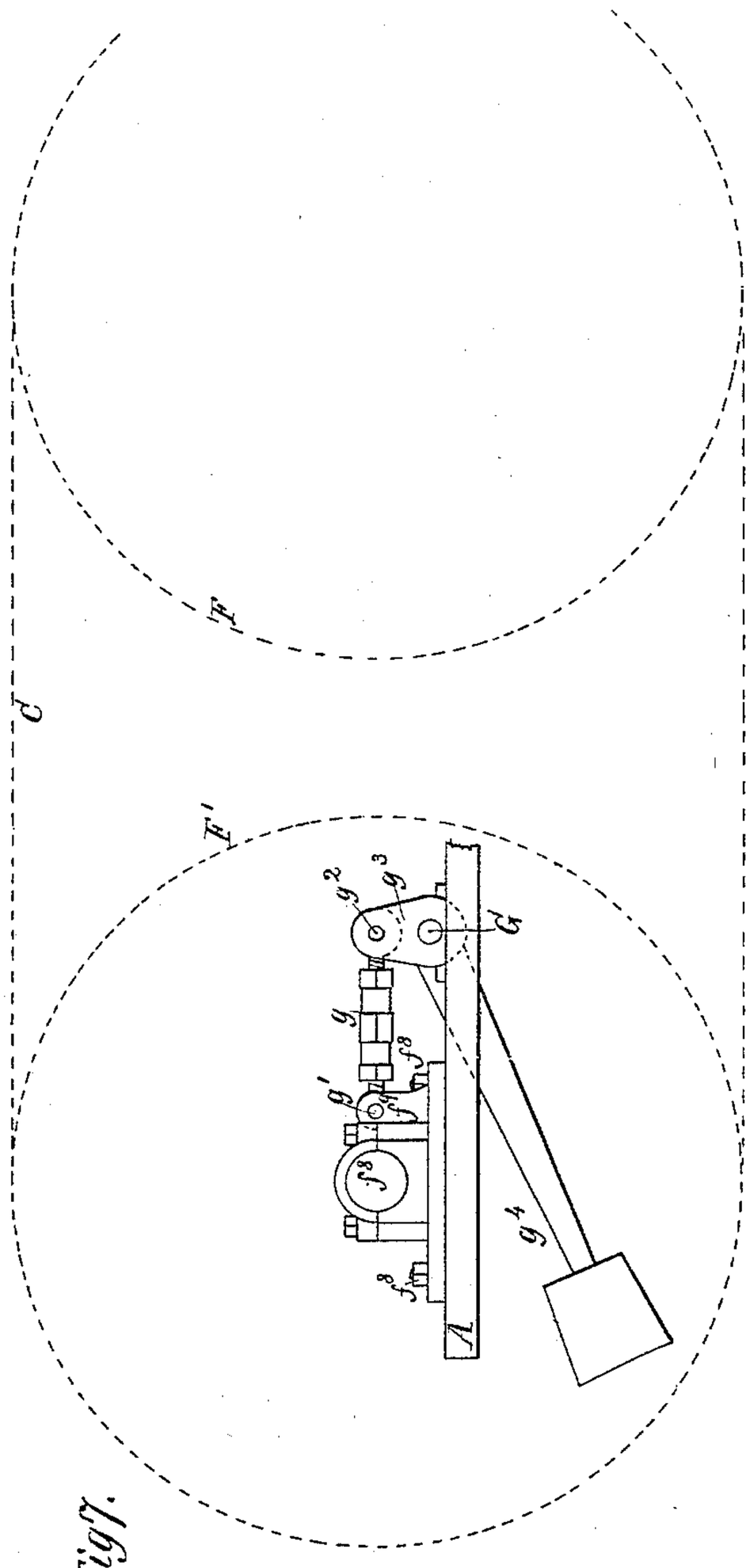

Fig 7.

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UNITED STATES PATENT OFFICE.

GEORGE W. MASON, NOAH SHAW, AND GEORGE H. HOPPER, OF EAU CLAIRE, WISCONSIN.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 453,598, dated June 2, 1891.

Application filed May 26, 1890. Serial No. 353,237. (No model.)

To all whom it may concern:

Be it known that we, GEORGE W. MASON, NOAH SHAW, and GEORGE H. HOPPER, citizens of the United States, residing at Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented certain new and useful Improvements in Machines for Resawing Lumber and Making Boards from Slabs; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to a machine for sawing lumber and making boards from slabs; and it consists in certain novel constructions, combinations, and arrangements of parts hereinafter fully described, and specifically claimed, whereby a resawing-machine of novel construction and great effectiveness is secured.

In the accompanying drawings, Figure 1 is a top view of our invention. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a front view of the machine. Fig. 4 is a sectional view of the feed-roller mechanism. Fig. 5 is a detail sketch of the shipping-gear in the feed-roller mechanism. Fig. 6 is a horizontal section of the supporting structure of a vertically-adjustable sawing and feeding mechanism, taken in line with the vertical adjusting mechanism; and Fig. 7 is a detail sketch of a tension mechanism for a band-saw used in our invention.

The letters A A′ A^2 in the drawings represent the stationary supporting-base constructed or mounted on standards or legs *a*, or sustained in any other suitable manner; B, a vertically-adjustable sawing-platform; C, a band-saw; D and E, feed-rollers.

The band-saw C is stretched over two pulleys F F′, of which F is the driving-pulley and F′ the tension-pulley. The pulley F is fastened to a driving-shaft *f*, which is hung to two bearings *f′*, and is provided with a driving-belt pulley f^2 between said bearings. These bearings are fastened by means of screws f^3 to the portion A of the base, and are aligned with the shaft of the tension-pulley by means of set-screws f^4, held in lugs f^5 of the said portion of the base. The tension-pulley F′ is fastened to a shaft f^6, which is hung to two sliding bearings f^7. These bearings are held to the said portion of the base A by means of screw-bolts f^8, which move in slots *a′* in said portion of the base, and thus permit the bearings to move in the direction of said slots, which are parallel with the band-saw C. These bearings are also provided with lugs f^9, to which two longitudinally-adjustable connecting-rods *g* are pivoted at *g′*, said connecting-rods being pivoted at g^2 to two tension-arms g^3 of a rocking shaft G, which latter is provided with a weighted lever-arm g^4, and thus gives the proper tension to the saw C.

The shaft *f* is provided with two metallic friction-disks *h*, which transmit their motion by means of their faces to the peripheries of two friction-disks *h′*, made, preferably, of pressed wood pulp, and fastened to shafts h^3, which are hung parallel to the feed-rollers above in bearings hereinafter described. The disks *h′* are longitudinally movable upon the shafts h^3, but are caused to revolve with them by means of splines h^4. They can be longitudinally moved upon said shafts and splines by means of loose collars h^5, fitted, as usual, in annular grooves of the hub portions of the disks *h′*, and having radial pins h^6, to which connecting-rods h^7 are attached. These connecting-rods are pivoted to the ends of two lever-arms h^8 on a rocking shaft h^9, which is suitably hung to the portions A and A′ of the base, as at h^{10}, and extends to the front of the machine, where it is provided with a lever-handle h^{11} for convenient manipulation. By moving the said lever-handle up the disks *h′* are moved toward the peripheries of the disks *h*, and thus have their speed increased, and by moving the handle down said disks *h′* are moved toward the centers of the disks *h*, whereby their speed is decreased. The bearings h^4 of the farther end portions of the shafts h^3 are of ordinary construction; but those h^{12} near the disks *h′* are provided with cylindrical sleeves *i*, having eccentrically-arranged bearings *i′* for the shafts h^3, whereby the operator is enabled to move the disks *h′* to and from the disks *h* by simply turning said sleeves in one or the other direction. This operation is facilitated by providing the sleeves with arms i^2, having their reduced

end portions i^3 in mortises of arms i^4 on a horizontally-sliding rod i^5. Said rod i^5 is held in position by being passed through two vertical hollow prismatical guides a^2 of the platform A, and it is moved by a hand-lever I, to which it is pivoted at i^6, and which is fulcrumed at i^7 to the base portion A.

Each of the shafts h^3 is provided with a conical wheel i^8 at its end opposite the disk h', and by means of this wheel moves another larger conical wheel j, fastened to a vertical shaft J. This shaft is secured longitudinally in a bracket-bearing j' by the hub of the wheel j below and a collar j^2 of the shaft above said bearing. The bracket-bearings j' are fastened one to the base portion A and the other to an auxiliary base portion A', connected with A by the bracket A^2. The upper portion of the shaft J is provided with a spline j^3, to which a sleeve j^4 is so fitted as to revolve with them and to slide up or down upon them. The sleeve j^4 is hung in a bearing j^5, to which it is vertically secured by an upper shoulder j^6 and a bevel-wheel j^7 below.

The bearings j^5 are fastened to two slotted standards K, both of which are formed with the sawing-platform B. On the opposite side of the platform B are two other slotted standards K, arranged with those previously mentioned in two parallel lines standing at right angles with the longitudinal axis of the sawing-platform and housing and supporting the bearings of the feed-rollers and feed-roller mechanism. The wheels j^7 are geared into gear-wheels d on the journal end portions d' of the lower feed-rollers D, which have their journal-bearings d^2 lodged in the bottoms of the vertical slots k of the standards K. The upper portions of the sleeves j^4 are provided with friction-wheels j^8, of wood or pressed wood pulp, which engage alternately with the faces of metal friction-disks k' k^2, united by a sleeve k^3, which can slide longitudinally upon shafts K' and cause the same to revolve with them by reason of a spline k^4 on said shaft. The wheels j^8 are arranged between the disks k' k^2, which are separated at a greater distance than the diameters of the wheels j^8, so that only one of said disks can at the same time be in contact with a wheel j^8, and thus the shafts K' can be revolved alternately in opposite directions by bringing either the disk k' or k^2 in contact with the wheels j^8. For the purpose of making such contact effective hand-levers k^5 k^6 are employed, which have their fulcrums k^7 k^8 near the shafts K' and their short lever-arms in grooves k^9, provided in the hubs of the metal disks. The shafts K' are hung in bearings k^{10} k^{11}, of which those k^{10} are directly connected or formed with the standards K and those k^{11} formed with the bearings j^5. The shafts K' are provided with bevel-wheels k^{12}, which gear into gear-wheels e, fastened to screw-shafts e'. The screw-shafts e' have their bearings in the heads k^{13} of the slotted standards K, to which they are longitudinally secured by the hubs of said gear-wheels above and by collars e^3 below. The portions of the screw-shafts e' below their collars e^3 are passed through the top portions of oblong frame formations e^4 of the bearings e^5, in the guide-slot formations e^6 of which nuts e^7 are fitted, through which the threaded portions e^8 of the shafts e' are screwed, said nuts e^7 bearing upon springs e^9, which rest and bear upon the body portions of the feed-roller bearings e^5. In this construction the bearings e^5 are held in proper vertical position by the shaft e' in passing through the top portion of the frame formations e^4.

By means of the hand-lever I the shafts J can at will be set in motion or stopped. When the shafts J are in motion, the lower feed-rollers are also in motion, which motion is regulated at will by means of the hand-lever h^{11}, as before described. If the upper feed-rollers E need vertical adjusting, the hand-levers k^5 k^6 are manipulated as above stated.

In order to adapt the machine to different thicknesses of boards, the sawing-platform B is made vertically adjustable, and is for this purpose provided with transverse lugs b, which are made to snugly fit the inner planed and finished walls of the hollow prismatic guides a^2, and which rest upon the end portions l of two forked levers L, the branches l' of which are fulcrumed at l^2 to lugs a^3 of the guides a^2, and enter said guides through slots a^4 therein. These branches l' are united by two transverse bars l^3, which are each provided with a toothed sector l^4. Said sectors occupy a central position with respect to the sawing-platform and the guides a^2, and stand sufficiently apart from each other to permit a weighted double rack L' to be introduced between them and to be geared into them. This rack L' is provided with a downward shank l^5, to which a weight l^6 is attached, whereby the greater amount of weight of the sawing-platform B is balanced. A small percentage of this weight is supported by a hand-lever B', fulcrumed at b' and bearing with its inner end portion b^2 against one of the lugs b of the sawing-platform. Thus when the handle portion b^3 of the said hand-lever is moved down the sawing-platform is raised, and when moved up the sawing-platform is lowered. The handle portion b^3 moves along an upright guide a^5, provided with notches a^6, into one of which the handle portion b^3 is moved in order to hold it there during the operation of resawing.

The band-saw C is steadied by means of a slotted guide M, which slides upon a transverse prismatic guide m, fastened to two brackets a^7 of the base portion A. The guide m is arranged parallel to the saw, so that the guide M does not leave the back of the saw when moved across the platform in order to suit different widths of boards to be sawed. The slotted guide M is provided with an arm m' and an angular cap-bearing m^2, which lat-

ter is, by means of an angular cap m^3 and screw-bolts m^4, attached to the guide m, upon which it is caused to slide by means of a hand-lever M′, which is fulcrumed at m^5 to a bridge-plate k^{14} of the two front standards K, and by means of a slot m^6 moves a pin m^7 of the cap-bearing m^3.

Below the guide m and precisely on the same level with the saw a spreader N is placed and fastened in a suitable manner to the brackets a^7. This spreader enters the kerf or slot made by the saw in the board and keeps the separated parts of the board from clamping the saw while passing through the rear feed-rollers.

One or more guide-rollers O are provided upon the platform B. These rollers prevent the board being sawed from being drawn by the saw out of its proper course so as to chafe against the standards, or run diagonally off from the platform B.

By employing the auxiliary base portion A′ in connection with the curved bracket A^2 we are enabled to provide our invention with a feed motion in front of the saw without arranging the saw-pulleys at a greater distance from each other than in ordinary constructions, wherein the base portions A′ and A are not employed. We are also enabled to remove and replace the band-saw whenever desirable without disturbing its mechanism any more than to remove the hand-lever M′, which could not be done if the base portion A′ were not supported by a bracket A^2, connected to the base portion A, and thus sustained in a position which admits of the removal and replacement of the saw, there being at this point no obstructing standards or legs.

When it is found that an end board or slab will furnish one or more good parallel boards of useful thickness, it is introduced into the machine, and notwithstanding the uneven upper surface of such slab the upper feed-rollers E will, by means of the yielding pressure of the spring e^9, as set forth, adapt themselves to all changes of such upper surface while the slab is passing through said feed-rollers. Thus the upper feed-rollers E will change from a right-hand inclined to a horizontal and then to a left-hand inclined position, and vice versa, keeping the true plane side of the slab hard down upon the lower feed-rollers, so as to deliver a parallel board.

Band-saws are usually arranged in vertical positions, and thus arranged they require two or three attendants to guide and remove the sawed boards by hand as they enter and leave the feed-rollers; but in our machine the saw is arranged horizontally and the boards to be sawed do not require any special guiding from the feed-rollers, as there is no danger of their falling over from a vertical to a horizontal position in leaving the feed-rollers and so interfere with the discharge of the finished boards upon the supporting saw-table, and consequently our machine does not require so many attendants.

What we claim as our invention is—

1. In a sawing-machine, in combination, a stationary supporting-base, a horizontal band-saw, a vertically-adjustable and laterally-guided board-supporting platform, and a roller-feeding mechanism attached to said platform and made adjustable to accommodate different thicknesses of boards and to regulate the pressure of the upper roller of the feeding mechanism, substantially as described.

2. In a sawing-machine, in combination, a stationary supporting-base, a vertically-adjustable and laterally-guided board-supporting platform, a horizontal band-saw of a fixed elevation and arranged on two pulleys F F′, one of which is a tension-pulley, a driving-shaft f for the pulley F, having two laterally-adjustable sliding bearings f' and adjusting-screws f^4, a laterally-adjustable tension-shaft f^6 for the pulley F′, having two sliding bearings f^7, provided with two longitudinally-extensible adjusting connecting-rods g, and a rocking shaft G, having arms g^3 and a weighted arm g^4, substantially as described.

3. In a sawing-machine, in combination, a stationary supporting-base A, having an auxiliary base portion A′, a vertically-adjustable board-supporting platform, a horizontal band-saw C, having a fixed elevation, lower feed-rollers D D, vertically-adjustable upper feed-rollers E E, arranged in pairs, one pair in front and one in rear of the band-saw, and suitable mechanism for adjusting and operating the said rollers, the mechanism for operating the front rollers being on the part A′ and that for the rear rollers on part A, substantially as described.

4. In a sawing-machine, in combination, a stationary base A, having auxiliary base-supporting portion A′, a vertically-adjustable and laterally-guided platform, a horizontal band-saw, a driving-pulley shaft f, disk h, a shaft h^3, spline friction-wheel h', an eccentric shipping journal-bearing i, in which shaft h^3 is hung, and a board-feeding mechanism, substantially as described.

5. In a sawing-machine, in combination, a stationary base, a vertically-adjustable and laterally-guided board-supporting platform, a horizontal band-saw, a board-feeding mechanism, the revolving vertically-fixed shaft J, suitable operating connections between said shaft and the driving-pulley shaft f of the machine, splined friction-wheel j^8, splined united friction-disks k' k^2, suitable means for shipping said disks, lower and upper feed-rollers, and suitable connecting mechanism for vertically adjusting the upper rollers of the board-feeding mechanism, substantially as described.

6. In a sawing-machine, in combination, a stationary base A A′, a vertically-adjustable and laterally-guided board-supporting platform, a horizontal band-saw, board-feeding rollers D E, a revolving vertically-fixed shaft J, suitable operating connections between the said shaft and the driving-shaft of the

machine, a spline bevel-wheel j^7 and a bevel-wheel d for operating the lower roller, and suitable mechanism for connecting the upper feed-roller E to the shaft J, substantially as described.

7. In a sawing-machine, in combination, a stationary supporting-base, a vertically-adjustable board-supporting platform, a horizontal band-saw C, having a fixed elevation, a transverse guide M for the saw, arranged on an elevated transverse guiding-bar of the supporting-base, which extends entirely over the platform and beyond its side edges, and also slides over the spreader N, which extends entirely across the platform and beyond its edges, said guide being provided with a hand-lever M′, and adjusted laterally thereby to accommodate wide as well as narrow boards, substantially as described.

8. In a sawing-machine, in combination, a base-support A A′, a band-saw, a vertically-adjustable platform, two pairs of feed-rollers arranged one pair in front and one in rear of the band-saw, and a spreader N of fixed elevation applied on brackets of the base and arranged between the saw and the rear pair of feed-rollers, substantially as described.

9. In a sawing-machine, in combination, a stationary base A A′, a band-saw arranged horizontally, a vertically-adjustable supporting-platform B, and lateral marginal guide-rollers O, attached to said platform, substantially as described.

10. In a sawing-machine, in combination, a horizontal band-saw, vertically-adjustable board-supporting platform B, fixed lower feed-rollers D, adjustable upper feed-rollers E, journal-bearing e^5, having vertical adjustment, screw-shaft e', nuts e^7, and interposed tension-springs, the said journal-bearings being capable of adjusting themselves along with the upper roller independently of the nuts and screws, substantially as described.

11. In a sawing-machine, in combination, a horizontal band-saw, a board-supporting sawing-platform having lugs b, a horizontal saw-supporting base having guides a^2, levers L, having toothed sectors l^4, double rack L′, having weight l^6, and lever-handle B′, substantially as described.

12. In a sawing-machine, in combination, the supporting-base A, provided with bracket A^2 and auxiliary supporting base portion A′, horizontal band-saw C, pulleys F F′, on which the saw is arranged, and a front feed mechanism supported upon the part A′, substantially as described.

In testimony whereof we hereunto affix our signatures in presence of two witnesses.

GEORGE W. MASON.
NOAH SHAW.
GEORGE H. HOPPER.

Witnesses:
M. GRIFFIN,
JOHN STEWART.