

W. M. Ferry,

2. Sheets. Sheet 1.

Saw Mill.

No. 113,865.

Patented Apr. 16. 1871.

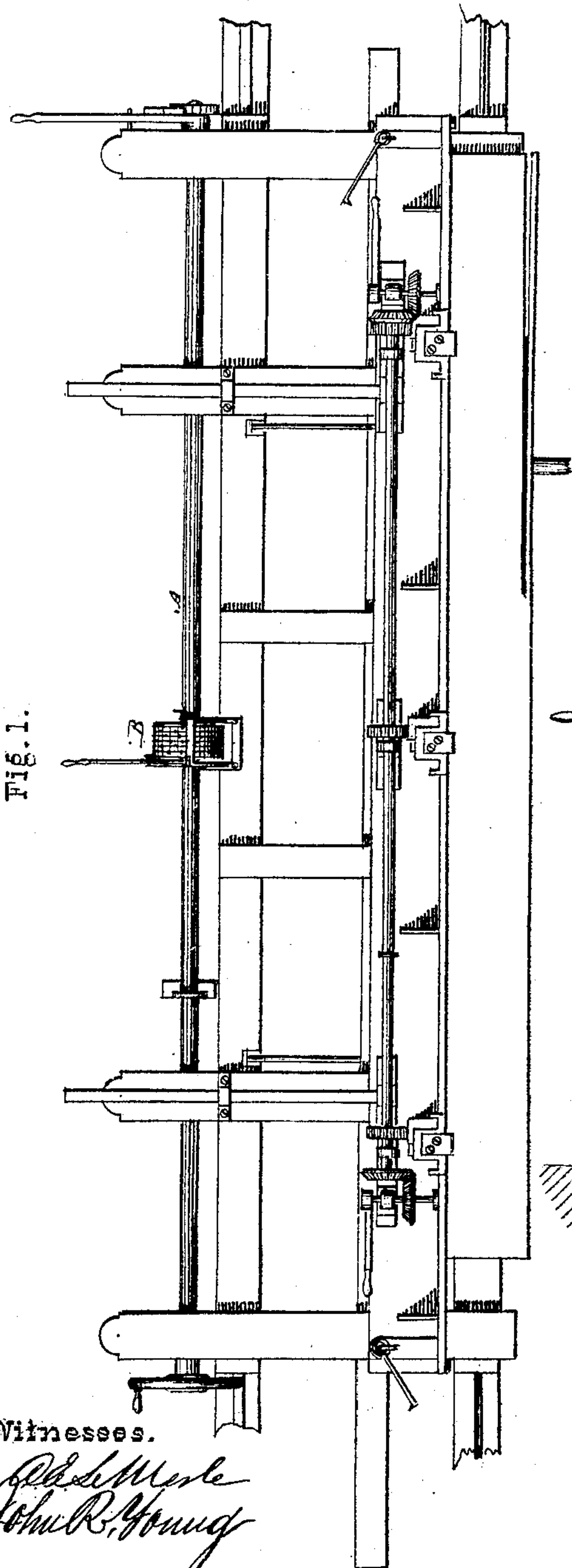


FIG. 1.

Witnesses.

John R. Young
John R. Young

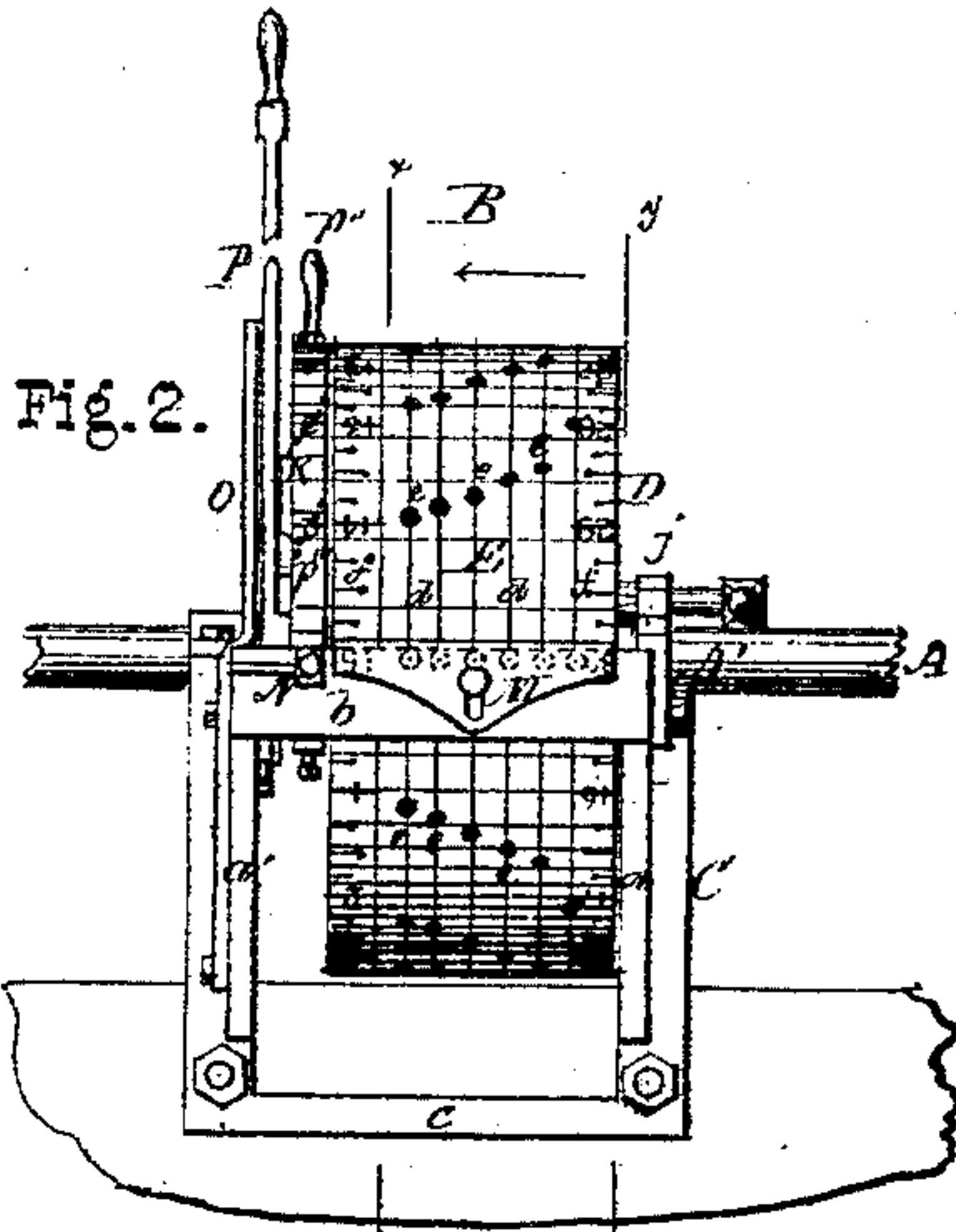


Fig. 2.

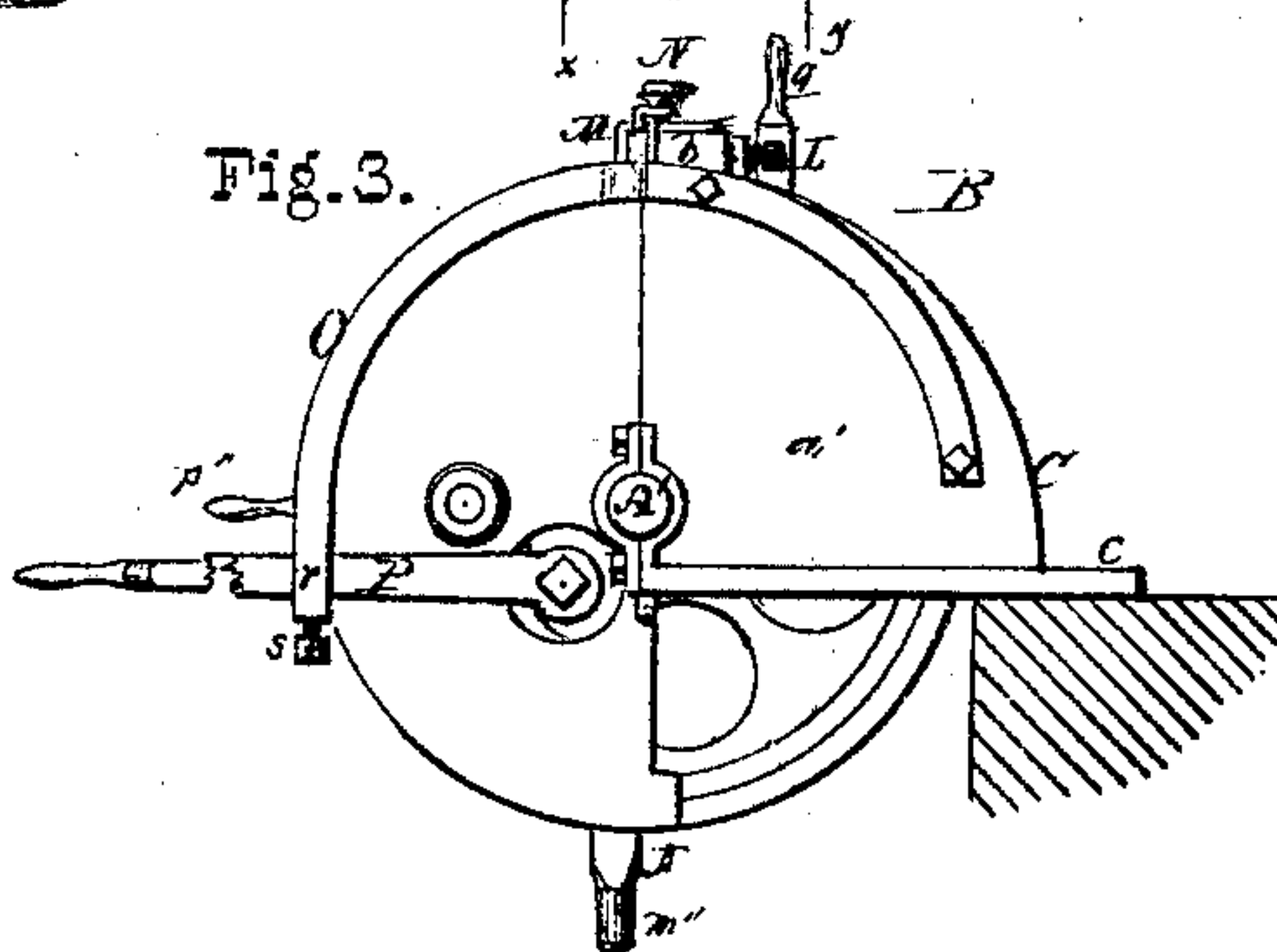


Fig. 3.

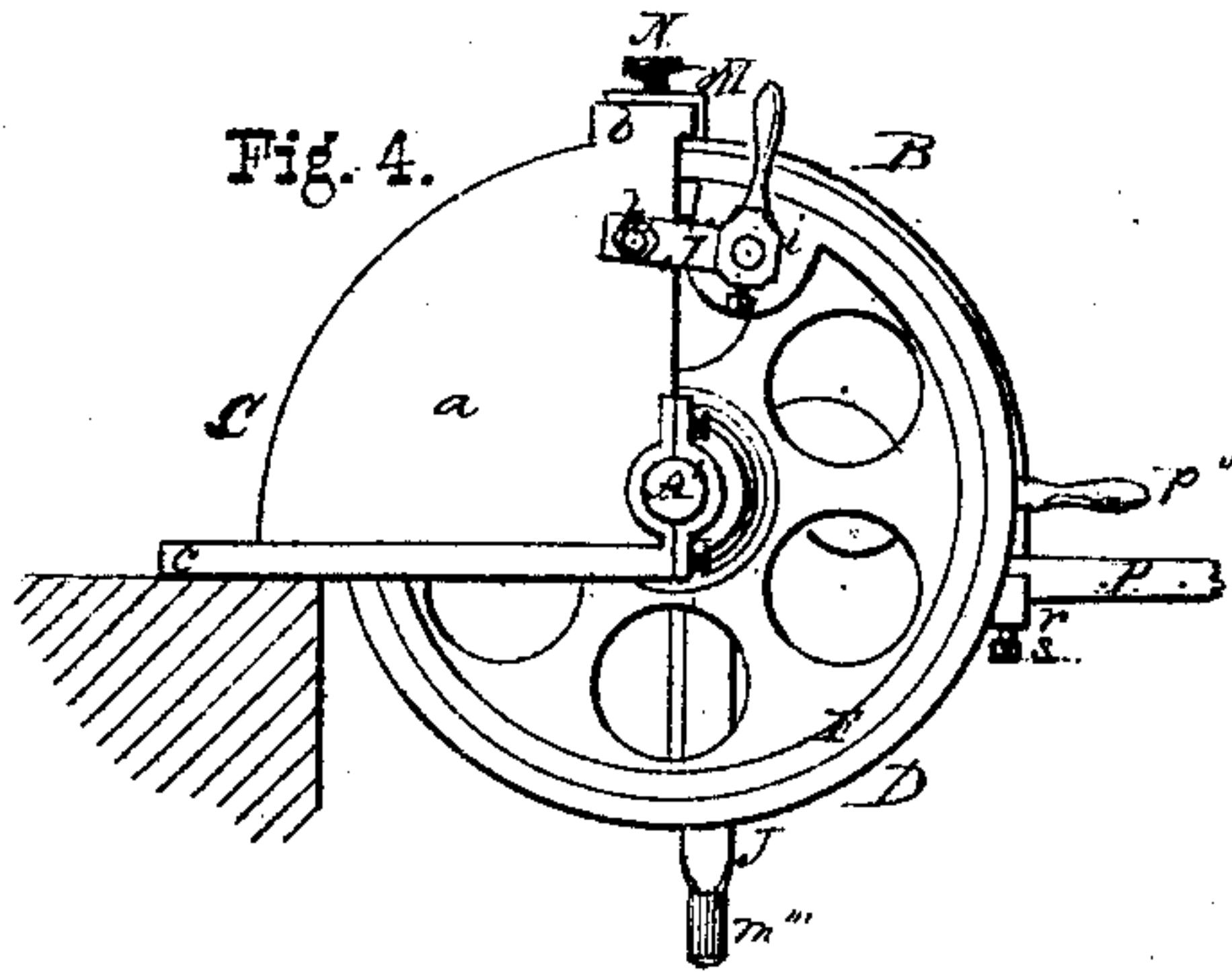


Fig. 4.

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2. Sheets, Sheet 2.

Saw Mill.

No. 113,865.

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Fig. 5.

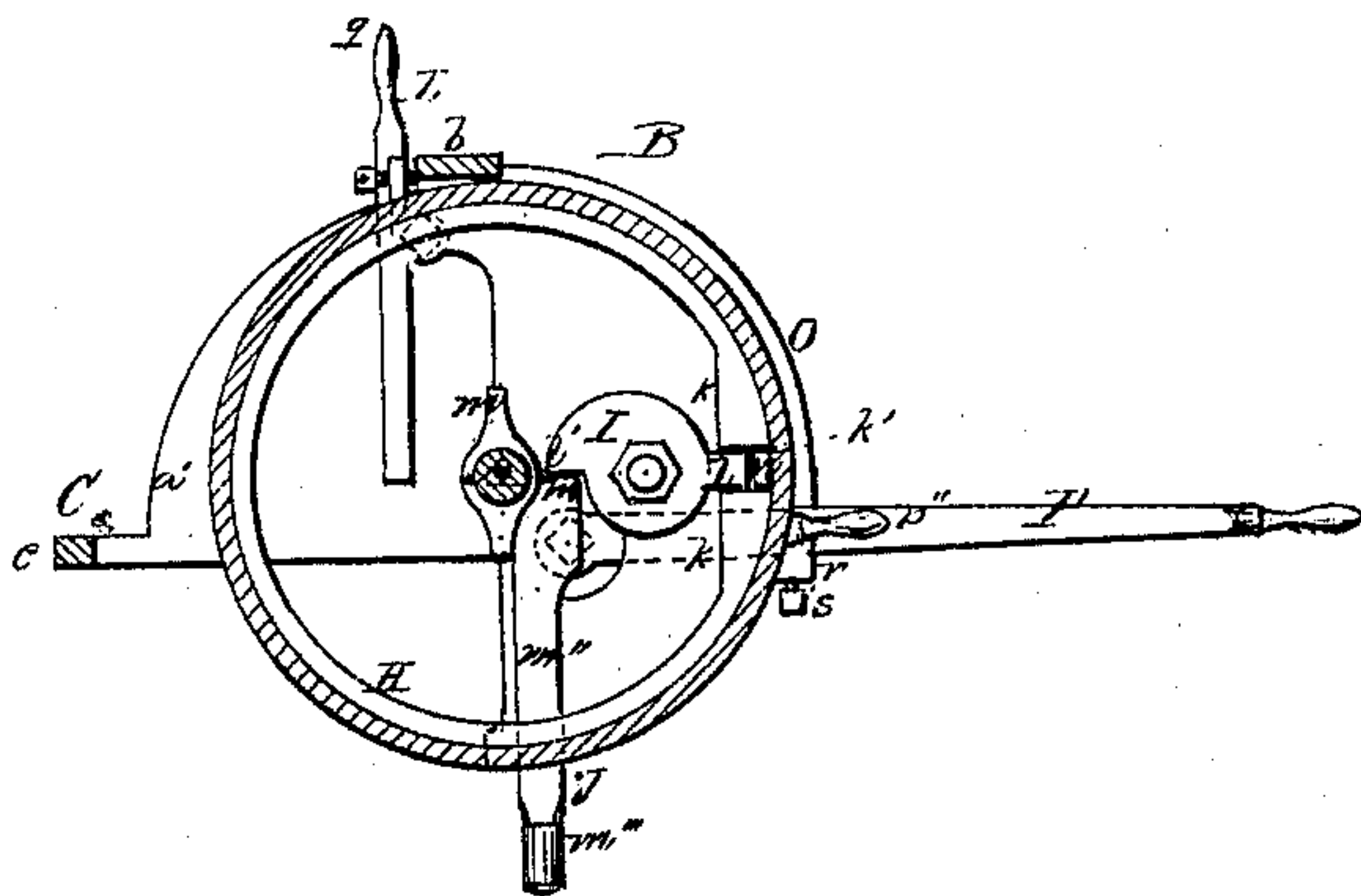


Fig. 7.

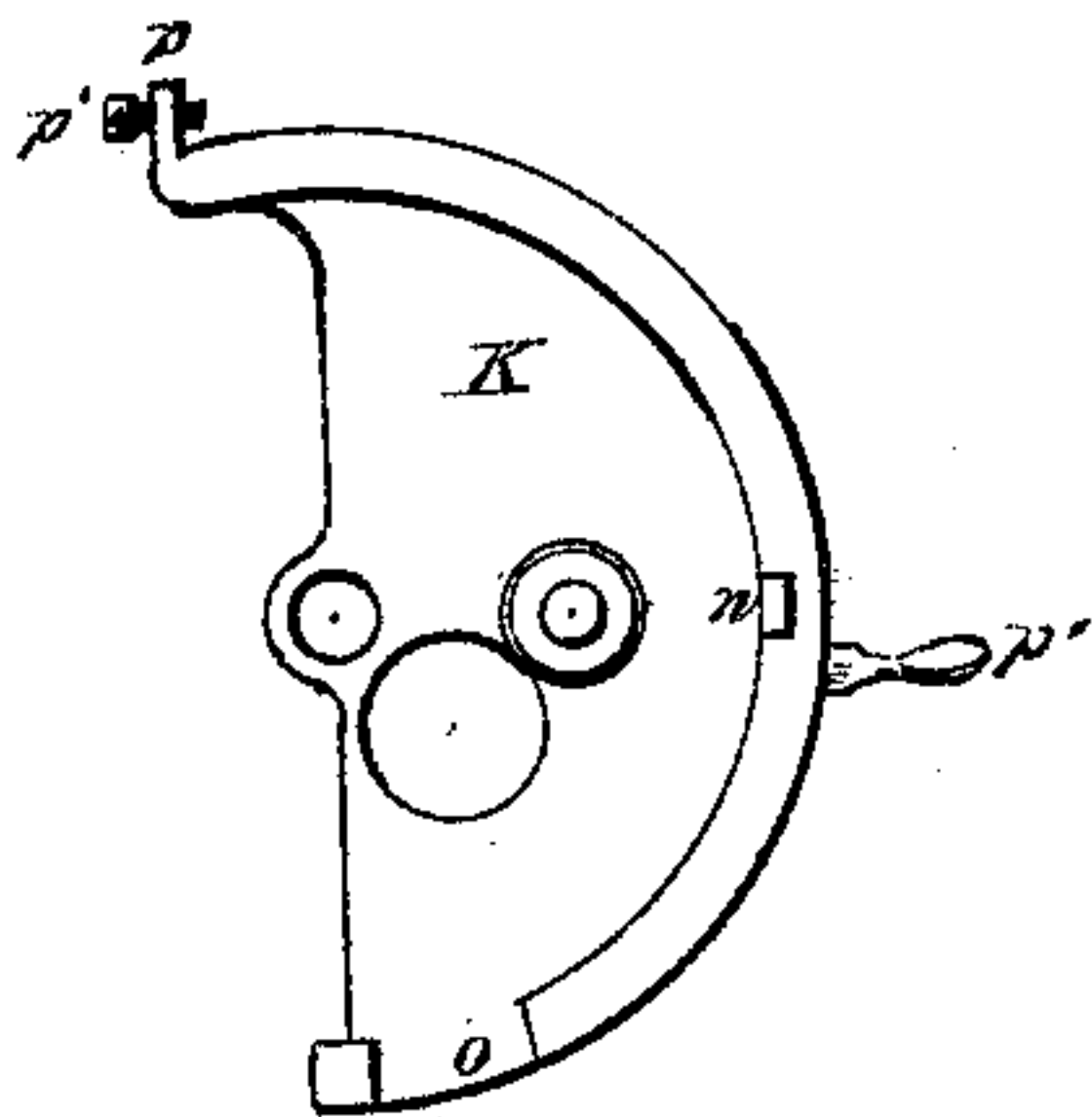


Fig. 8.

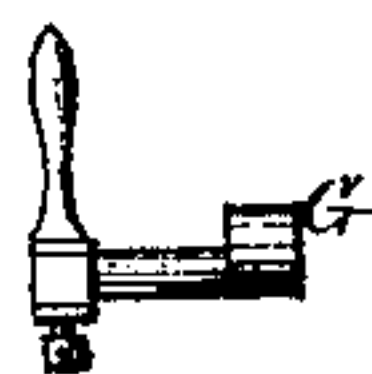
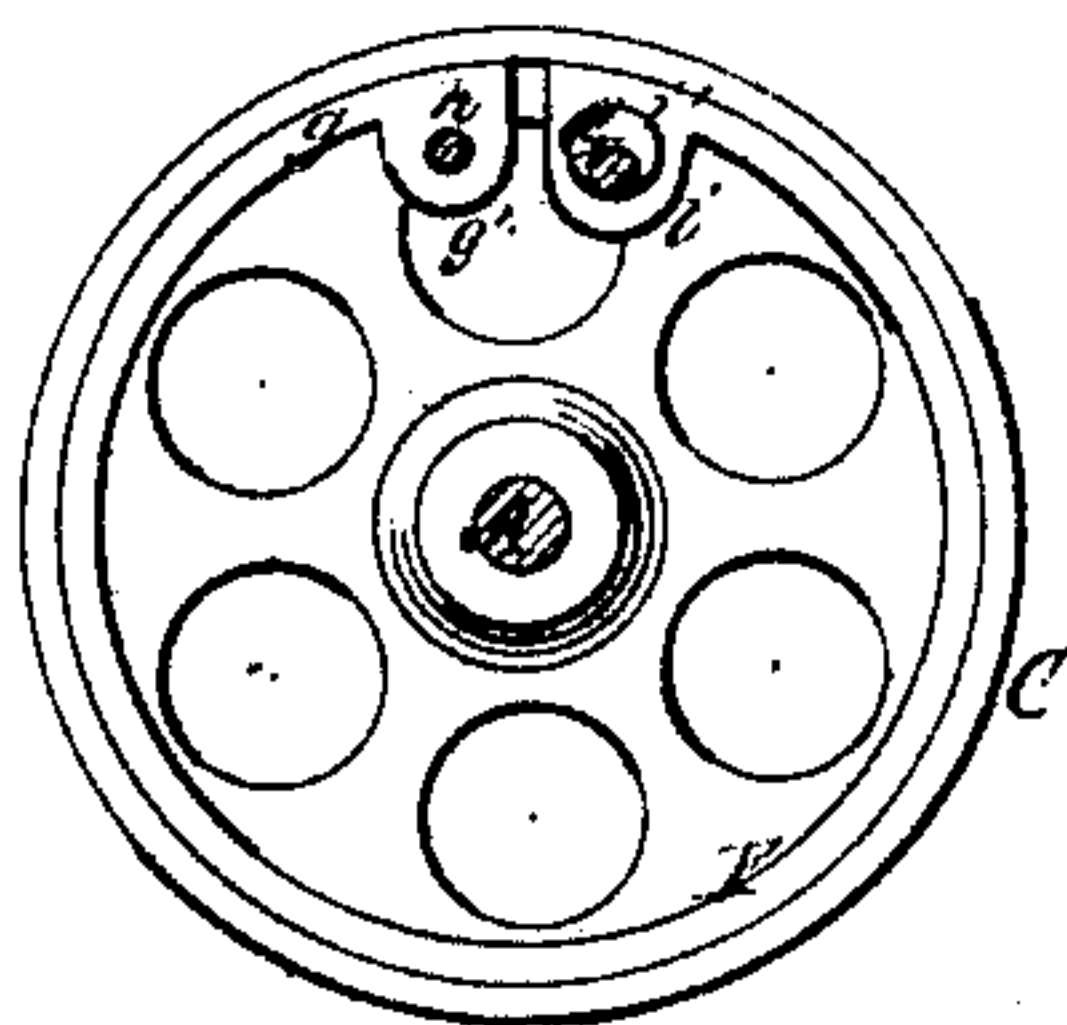


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM M. FERRY, OF GRAND HAVEN, MICHIGAN.

IMPROVEMENT IN SAW-MILLS.

Specification forming part of Letters Patent No. 113,865, dated April 18, 1871.

To all whom it may concern:

Be it known that I, WILLIAM M. FERRY, of Grand Haven, in the county of Ottawa, and in the State of Michigan, have invented certain new and useful Improvements in Saw-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of a log-carriage, showing the construction and arrangement of its various parts, with the device which is the subject of this application in position. Fig. 2 is front elevation of my device in position for work. Fig. 3 is an end elevation of the lower end of the same. Fig. 4 is a similar elevation of the opposite end. Fig. 5 is a vertical section in the line *x x* of Fig. 2. Fig. 6 is a similar section on the line *y y* of Fig. 2. Fig. 7 is a side view of the dial-plate detached, and Fig. 8 is a similar view of the eccentric which operates the detent-ring.

Like letters of like kinds denote corresponding parts in each figure.

In saw-mills as constructed heretofore mechanism has been employed for moving the log already in position upon its carriage up to the line of cut of the saw, and for giving it a further motion, either automatically or at will, such a distance as may be required, for the cutting off of boards or planks all of uniform thickness from the same log, or, by a removal and substitution of gear, boards or planks of other uniform thicknesses, and also contrivances which will automatically space off and divide the thickness of the log, so that it may be sawed into boards or planks of uniform thickness; but none of these contrivances work advantageously, for the reason that there is so much slip and wear in their operative mechanism that the boards will not be of uniform thickness, which is a great loss to the manufacturer, as, by the usages of trade, a board which is not of the full thickness of its dimension is either rejected as badly sawed, and goes into a low class of lumber, or is measured and paid for as of the thickness next below it, while a board which is a little too thick will not be measured and paid for the surplus thickness, and is liable to be rejected, as badly sawed, wholly from its class.

Now, the object of my invention is the con-

struction of mechanism which shall combine setting and gaging; which shall move the timber into position for cutting, either automatically or at will, any distance required of even inches or of fractional parts of the same; which shall do this without slip or loss from wear of the operative mechanism, so that all the boards or planks sawed shall be of the precise width or thickness required; which, when once adjusted in position in the mill, cannot in any way lose its adjustment; requires no mechanical skill in its management; which shall at all times display the portion of the log which has been sawed and the portion which remains unsawed, and shall in all respects be simple, durable, effective, and of no great cost; and my invention consists in the peculiar construction, combination, and arrangement of the operative parts which effect the above-named purposes, all as more fully hereinafter described.

In the drawings, Figure 1 represents a log-carriage with a continuous head-block upon one side, which head-block is traversed across said carriage with a uniform movement throughout its entire length by means of a longitudinal shaft, A, in connection with pinions secured upon said shaft, and meshing with racks which operate the standard of said head-block of this shaft A. The shaft A', which is the driving-shaft of my device, is a component part, either by being the same shaft upon which the device is properly secured or a separate shaft coupled to or otherwise secured in line of said shaft A.

The device above spoken of is designated by the letter B, and is constructed wholly of suitable metal, and has various parts, which are now described.

The frame C is composed of quadrant-shaped end pieces, *a a'*, the latter of which is, next the lever end of my device, connected at their tops by a cross-bar, *b*, which is also a gage-bar, and at their bottoms on the outer edges by another cross-bar, *c*, which projects outwardly from the said side pieces, with a flat surface, and along their sides at the bottom with a flange, so as to give proper bearings, through which the whole organism B is firmly secured to the log-carriage above spoken of. In the front edges of the end pieces, *a a'*, are openings, within which the shaft A' turns, which openings are provided with suitable boxes and caps. Secured upon this

shaft A', and turning with it, is a wheel, D, having a broad dial-periphery, E, upon whose face are cut several parallel lines, *d*, extending around said periphery, and conical shallow indentations *e* upon said lines at equal distances apart upon the same lines.

In the drawings herewith furnished, the device being intended for sawing lumber for a certain market, there are six of these lines, each furnished with the indentations described, commencing next the lever end of the device with the line for inches, and followed successively by the lines for one and one-sixteenth, one and one-eighth, one and one-quarter, one and one-half, and two inches, which indentations are upon their respective lines one, one and one-sixteenth, one and one-eighth, one and one-quarter, one and one-half, and two inches apart, and also in every instance the additional thickness required for the saw-kerf. Upon the periphery E are also cut cross-lines *f*, respectively, between the lines for one inch and for two inches, to the outside of said periphery, which cross-lines are at the distance of one inch and some fractional part of an inch asunder, and are plainly marked with suitable numerals upon the inch-lines. In the drawings these cross-lines are marked upon the lever side of the device from 1 to 15, and on the opposite side from 16 to 30, both inclusive in each instance, and the numerals are so arranged that when one revolution of the wheel D exhausts the numbers on the lever side, then, upon further rotation, the numbers on the other side follow in their regular sequence. It will be readily perceived that all these lines, numerals, and perforations may be readily changed, so as to be adapted for use of the device for sawing any desired dimensions of lumber; but the number of spaces to represent inches upon the dial must correspond with the number of inches contained in the circumference of the wheel or pinion at its pitch-line, which wheel or pinion serves to move the timber to be cut into the proper position for the dimension required.

Within the periphery of the wheel D, on the end of the device opposite the lever, is a divided ring, F, which closely fits to the inner side of the periphery aforesaid in all parts, except at that portion where the ring is cut off, and a small space left between its two ends. One of these ends, *g*, is provided with a dependent ear, *g'*, through which a bolt, *h*, passes and secures it firmly to the side *a* of the frame C. The free end of the ring is also provided with a dependent ear, *i*, having a circular lateral opening, *i'*, in which an eccentric, G, operates. This eccentric is secured upon a shaft which is journaled in a bracket, *j*, secured upon the outside of the end *a* by means of the bolt *h*, before mentioned. The eccentric has secured upon the outer end of its shaft a suitable lever, by which it is operated. The whole surface of the ring agreeing precisely in contour with the inner periphery of the wheel, when the eccentric is turned in one direction

it compresses this ring endwise and increases its hold or grip at all points, so that the wheel cannot be turned in any direction. When the eccentric is turned in the opposite direction, the ring is loosened at all points, and the wheel will revolve freely either way. When the eccentric is turned in still another direction, its action compresses the free end upward and backward, so that it bites at and near said free end, and in that position the wheel will turn in the direction following the increase in numbers of the numerals, but will not revolve in the opposite direction. Upon the opposite end or lever end of the wheel D, and similarly arranged, is another divided ring, H, having its ends *k* made thicker and separated by a rectangular recess *k'*. Into this recess a corresponding lug, *l*, of the cam I is fitted, which cam is journaled upon the inner side of the end *a*, upon a proper spindle, and has on the side opposite the lug above named a lip, *l'*. A cam-lever, J, is pivoted upon the shaft A', having a corresponding face, *m*, against which the lip *l'* engages a lug, *m'*, used in connection hereinafter mentioned, and a handle, *m''*, which extends beyond the periphery of the wheel D, provided at its extremity with a friction-roller, *m'''*, which turns upon the end of the handle. This ring H is so arranged and fitted within the periphery of the wheel D that in a state of rest it does not pinch or bind at any point; but when the cam-lever J is raised it partially rotates the lug *l* of the cam I within the recess *k'*, and it operates as a lever to move the two ends of the ring asunder, forcing said ends against said inside of the periphery and causing them by friction to turn said wheel. When the pressure of the cam-lever is removed, the leverage of the cam I ceases, and the wheel rotates readily over said ring. A dial-plate, K, (represented separately in Fig. 7,) of a semi-circular form, rotates upon the shaft A', and is provided with a stud, *n*, which fits into the recess *k'*, and with a periphery forming a flange on one side of it. A portion, *o*, of this flange is cut away so as to leave room for the play of the handle *m''* to the cam-lever J, and upon the upper corner of the periphery a stop, *p*, is secured, having upon it a set-screw, *p'*, and near the center of the periphery is a hand-pin, *p''*, for convenience in rotating the same. The stud *n*, however, in its operation within the recess *k'*, has a direct movement and does not cause the ring H to bind or bite in any part, and the hand-pin *p''* will rotate the dial-plate and its attachments freely up and down. Upon the upper portion of the periphery is also cut cross-lines the distance of one inch asunder, and also other lines showing the thickness of saw-kerf, and the first-named lines are numbered, respectively, from top to bottom with numerals, commencing with 1. In connection with these lines are pin-holes *p'''* for use in regulating and adjusting for different thickness of saw-kerfs.

Pivoted upon the inside of the end *a'*, and a little in front of the cross-bar *b*, on the lever

end of my device, is a weighted stop, L, provided with a handle, *q*, projecting beyond the periphery of the wheel D, so arranged that its weight will incline it to present its lower end against the lug *m* of the cam-lever J, and prevent the dial-plate from moving back. A gage-plate, M, is fitted upon the top and side of the cross-bar *b*, having a slot upon its top, in which a set-screw works, by means of which the position of its lower edge next the dial E may be moved toward or away from said cross-bar. A spring-stop, N, is also arranged in the side of said cross-bar next the lever end thereof, having a sharp lower edge, so that when pressed down by hand the edge may engage in the cross-lines on the dial beneath it.

To the outside of the end piece, *a'*, is secured a guide, O, semi-annular in form, the free end of which terminates in a hook, *r*, and upon the bottom of this hook is a set-screw, *s*, which penetrates the guide, and serves to regulate the fall of the hand-lever next to be described. This lever P is secured upon the side of the head of the cam-lever J, a suitable opening being left in the dial-plate K, and works between said dial-plate and the guide O, limited in its movement between the hook *r* and the cross-bar *b*. The raising of this lever, through the connections of the cam-lever J, the cam I, and the ring H, rotates the dial and the dial-plate simultaneously, while by its own weight it falls back into place, carrying only the dial-plate with it.

In the automatic action of my device the handle *m''* of the cam-lever J is worked by being tripped by an adjustable-gage incline, which tripping attachment has been described in former Letters Patent issued to me. This mechanism of mine is placed with great care upon the driving-shaft A, pains being taken to have said shaft in line with the log-carriage and to have the shaft-pinions of a proper circumference at their pitch-line, so that the movement of the head-blocks shall correspond with the revolutions of the dial, care being also taken to have the dial in such a position that the distance between the line of the saw and the face of the standard of the head-block when it is fed out to its greatest extent will be represented by that portion of the dial beyond some convenient and readily-remembered numeral upon the dial—as, for instance, the numeral 1—the line of which numeral will coincide with the front edge of the gage-bar *b*. The head-blocks being run back the desired distance by means of the hand-wheel attached to one end of the driving-shaft, and a log or cant being laid upon the carriage and securely dogged, and the head-block being run forward the desired distance for the saw to take the first cut, the distance between the line of the saw and the head-block will be designated by the numeral and its fractional parts next in front of the gage-bar. It can then be determined at a glance into what dimensions of lumber the log or cant can be sawed most profitably, and an adjustment made accordingly.

Setting automatically, the tripping device before spoken of being adjusted to cut the dimensions of lumber required, the carriage, in each operation of gigging back, will, by impact of said tripping device against the friction-roller *m'''* upon the handle of the cam-lever J, move the head-block the desired distance for the next cut, at the same time revolving the dial the same distance, and bringing the center of the next indentation upon the proper line for the dimension, just in line with the front of the gage-bar *b*. The dial-plate, by the weight of the working-lever, will fall back into its first position, carrying with it the handle of the cam-lever, ready to receive another impact from the tripping-gear.

The sawyer may at will operate my device by means of hand-lever P.

This mill may set any dimension of lumber either automatically or by hand. The log or cant being in position as before, the sawyer, on seeing the thickness of the log plainly designated upon the face of the dial, determines into what dimensions it can be most advantageously sawed, and by raising the lever revolves the dial the distance desired, in each instance raising the lever with one hand and with the other hand pressing down upon the stop N until its face engages with the desired cross-line on the dial-plate, and restrains the further rotation of the dial and the onward movement of the head-block. After each raising of the hand-lever, it falls by its own weight back into the hook, carrying the dial-plate with it; or, instead of using the stop N to restrain the revolution of the dial-plate, he may use the pins which fit the pin-holes in said plate. By this means the sawyer can saw the whole log, in the first instance, into boards or planks of equal thickness; or he may cut up a portion of the log into ordinary dimensions, and before he finishes it divide the remainder, whose entire capacity is always represented on the dial before him into equal or unequal dimensions, so that there shall be no waste whatever. After long use of this mechanism it may be found that there has been some wear of the shaft-pinions or their meshing racks, or of both, so that a little compensation is needed upon the dial-plate. This compensation is effected by means of the set-screw *s* in the hook *r*, and *p'* on the back of the gage-bar. These same set-screws serve to compensate for any difference in the thickness of the saws which may be used, and this compensation may also be effected by the use of set-pins in the pin-holes on the face of the dial-plate. The effect of these changes will not change in any way the action of the dial, but will make it necessary to adjust the gage-plate M so that its lower edge shall project more or less in front of the gage-bar. When the saw has completed its cut in the log, the sawyer, by turning the eccentric, releases the ring which acts as a detent, suffering the dial to revolve easily, and the head-blocks are readily run back by the hand-wheel, as before mentioned. After

this is accomplished, the eccentric should be turned into its former position, so that the detent-ring will bite in one direction and permit rotation in the other.

I do not wish to restrict myself to the use of such parts of my mechanism as are novel in connection with saw-mills, but desire to make use of such parts for whatever purpose and with whatever other machinery they or any part of them may be applicable.

Having thus described the purpose and construction of my device, what I claim as new therein is—

1. The divided ring F, constructed substantially as described and shown, when used as a detent.

2. The combination of the divided ring F and the wheel D, both constructed substantially as described and shown, when employed as a friction-detent.

3. The means employed for securing a friction-detent, consisting of the ring F, the wheel D, and the eccentric G, substantially as described and shown.

4. The arrangement of the eccentric G, the ring F, and wheel D, substantially as described, for the purpose set forth.

5. The divided ring H, constructed substantially as described and shown, for the purpose of communicating motion by friction.

6. The combination of the divided ring H and the wheel D, both constructed substantially as described and shown, for the purpose of rotating said wheel by friction.

7. The means employed for producing friction between the divided ring H and the inner periphery of the wheel D, and for rotating said wheel, consisting of the cam I, provided with the lug *l*, all constructed and arranged substantially as described and shown.

8. The combination of the ring H, with its devices for rotating the wheel D, and the ring F, with its devices for preventing the rotation of said wheel, substantially as described and shown.

9. The means employed for making the rotation of the dial E automatic, consisting of the cam-lever J, provided with the handle *m''*, having a friction-roller, *m'''*, the cam I, and the ring H, in connection with a suitable tripping device, all substantially as described.

10. The means employed for making the rotation of the dial E at will, consisting of the hand-lever P, the cam-lever J, the cam I, and the ring H, all constructed and arranged substantially as described and shown.

11. The means employed for rotating the dial E and the dial-plate K simultaneously, consisting of the hand-lever P, the cam-lever J, the cam I, and the divided ring H, all constructed and arranged substantially as described and shown.

12. The combination of the dial-plate K, provided with the stud *n*, and the divided ring H, each constructed and arranged substantially as described and shown.

13. The combination of the stop L and the cam-lever J, each constructed and arranged, substantially as described and shown, for the purpose of preventing backward rotation of the dial-plate K.

14. The combination of the spring-stop N and the dial-plate K, each constructed, substantially as described and shown, for the purpose of arresting the rotation of the dial and dial-plate at any desired point.

15. The means employed for compensating for varying thicknesses of saws, consisting of the set-screws *p'*, in connection with the gage-bar *b* and *s*, in connection with the guide O, constructed, arranged, and operating substantially as described and shown.

16. The means employed for correcting the gage to meet the varying thicknesses of saws, and the wear of shaft-pinions and racks, consisting of the gage-plate M, in connection with the gage-bar *b*, constructed, arranged, and operated substantially as described and shown.

17. The arrangement of the dial E in relation to the pinions of the shaft A in such a manner that the dial shall at all times display the unsawed thickness of the log upon the carriage, substantially as described and explained.

In testimony that I claim the foregoing I have hereunto set my hand this 20th day of February, 1871.

WILLIAM M. FERRY.

Witnesses:

HENRY G. BIGELOW,
C. C. CASE.