

(No Model.)

4 Sheets—Sheet 1.

H. L. BEACH.
SAWING MACHINE.

No. 429,836.

Patented June 10, 1890.

Fig. 1.

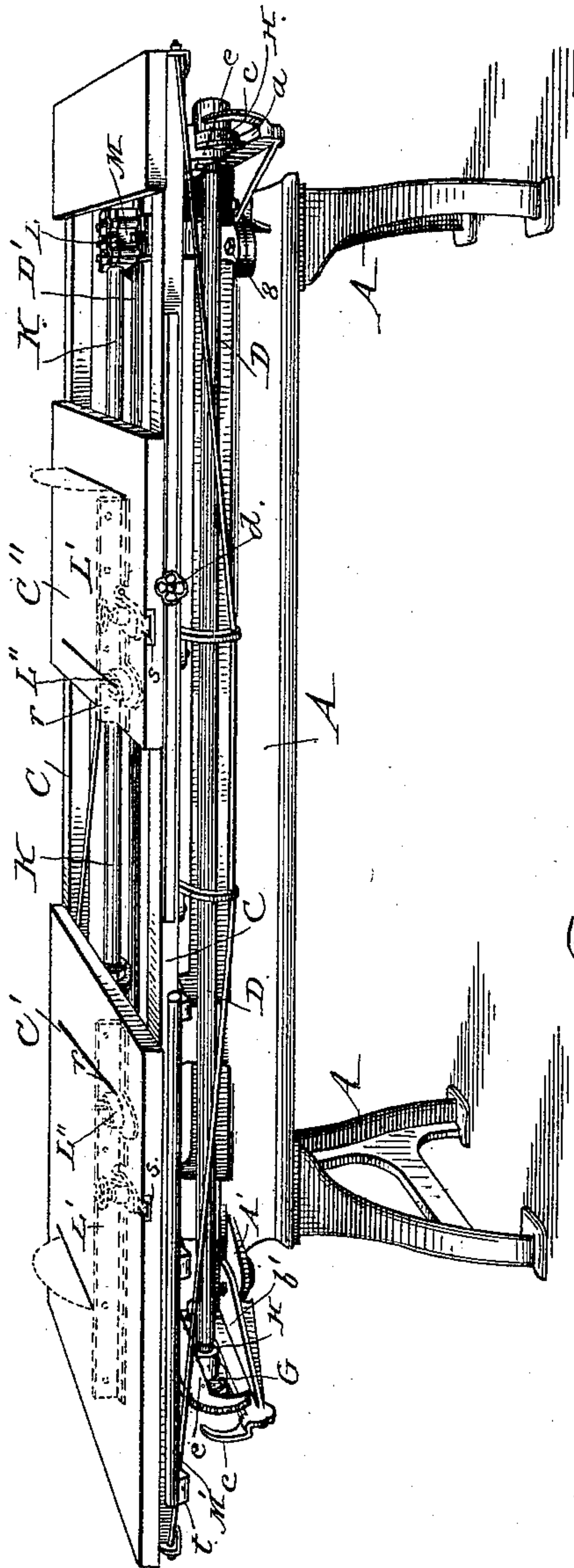
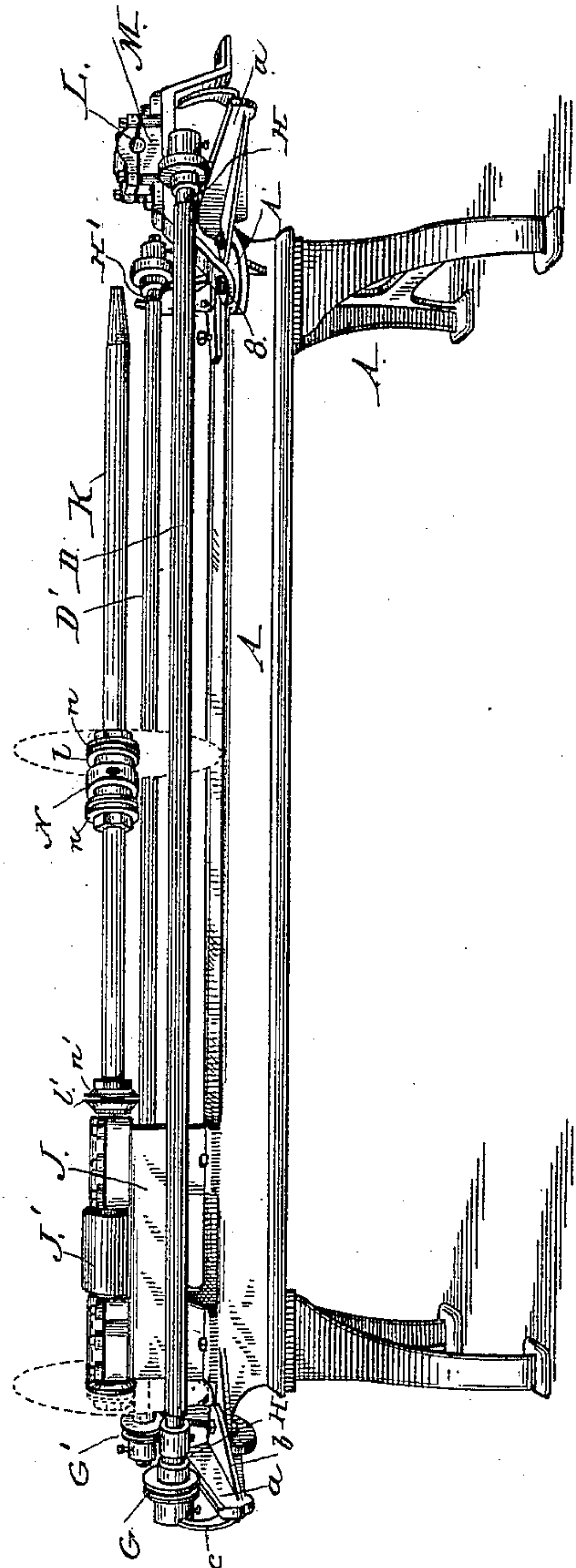


Fig. 2.



Witnesses

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Fig. 3.

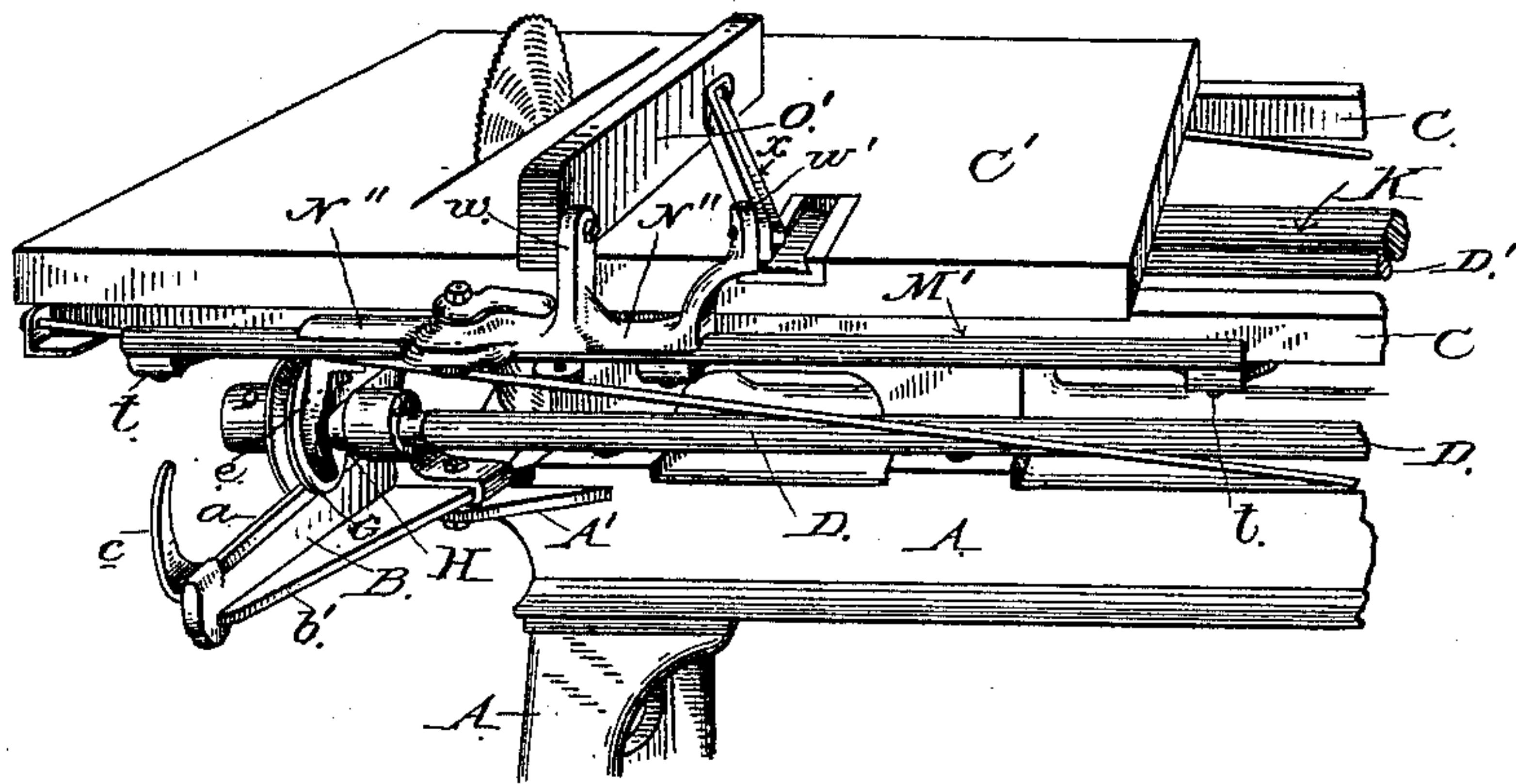


Fig. 4.

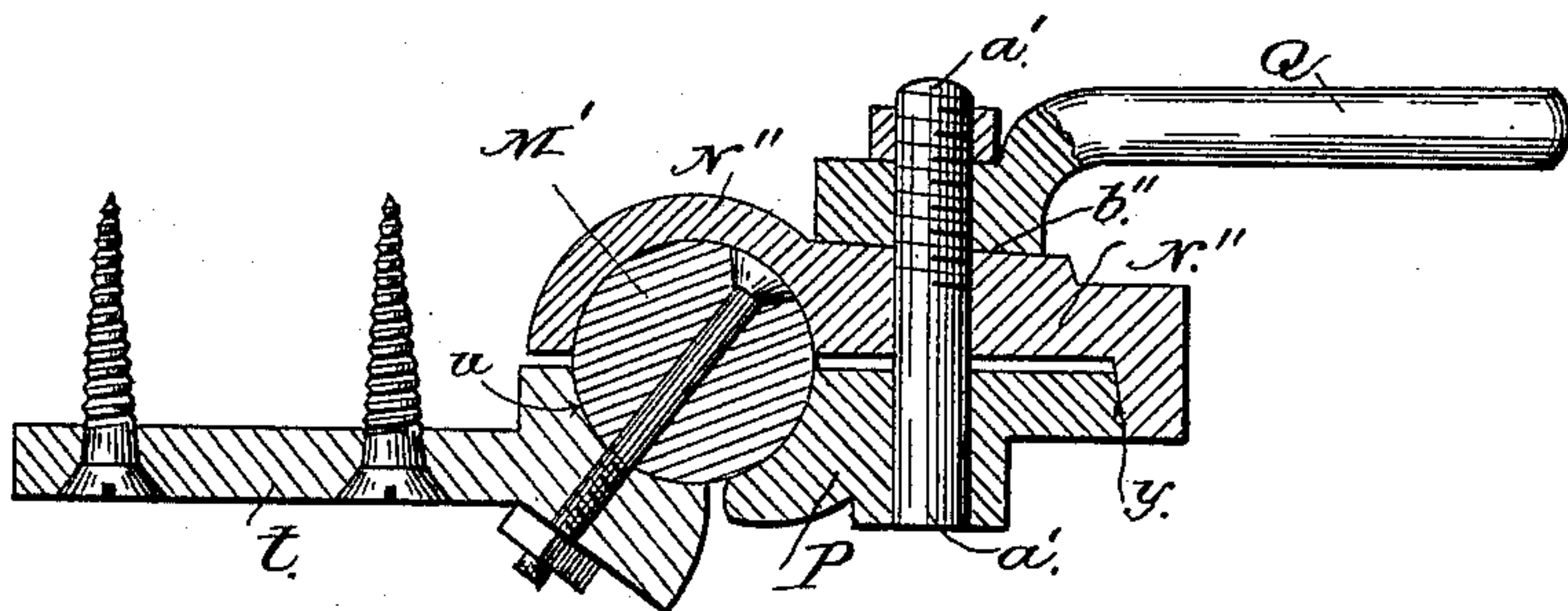
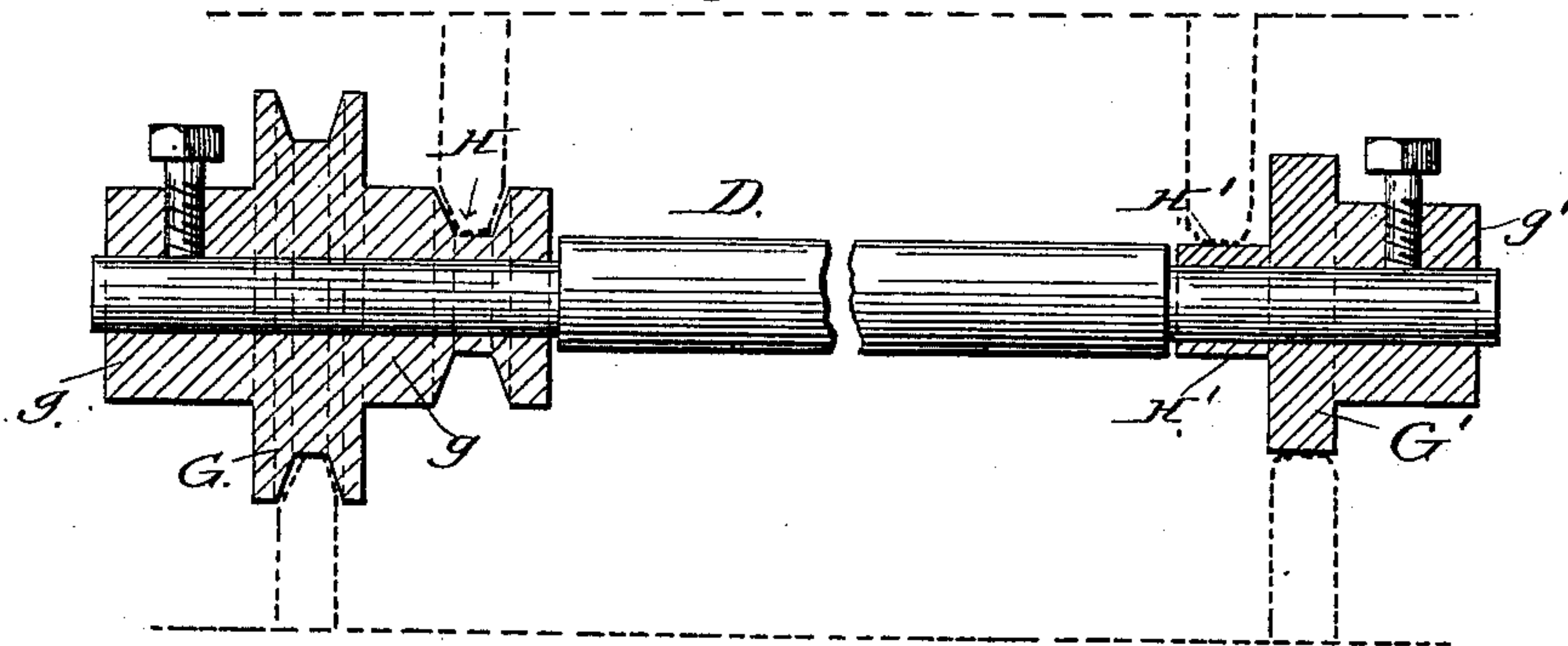


Fig. 5.



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Fig. 6.

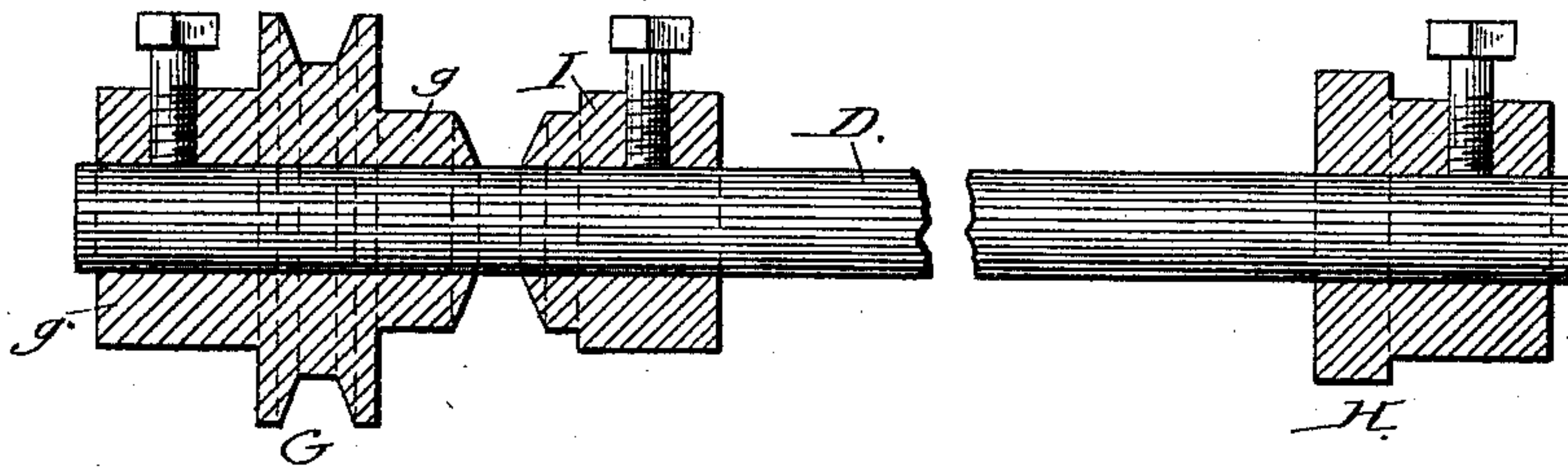


Fig. 7.

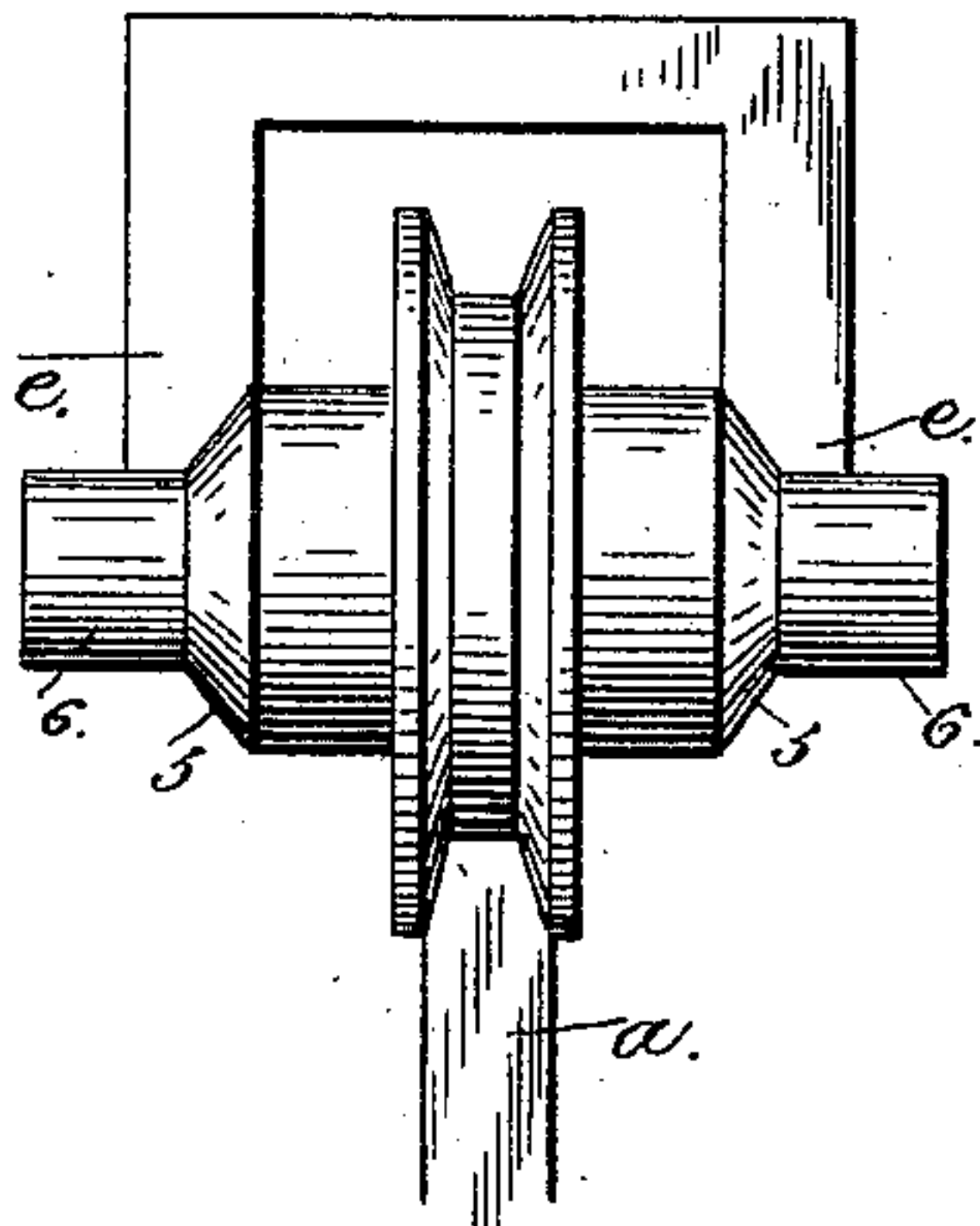


Fig. 8.

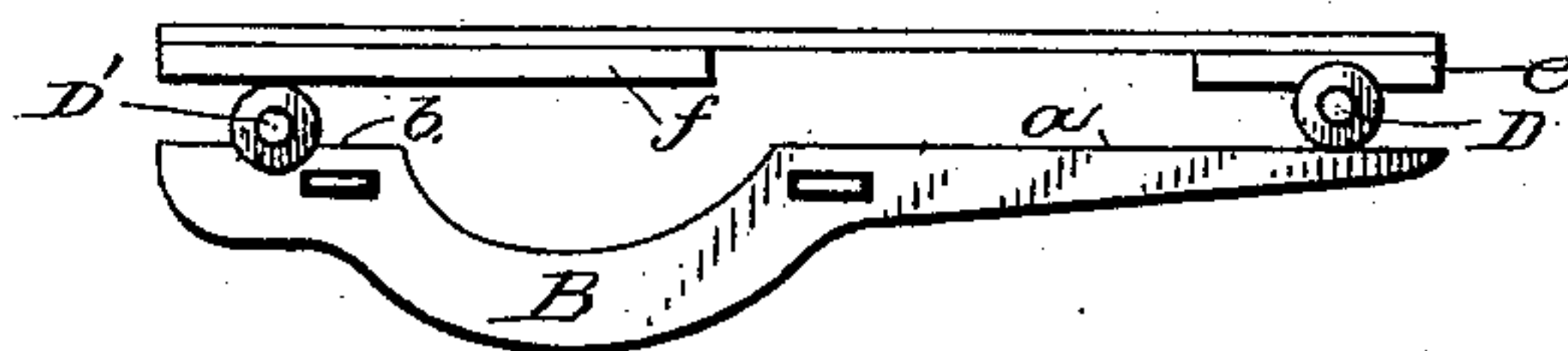
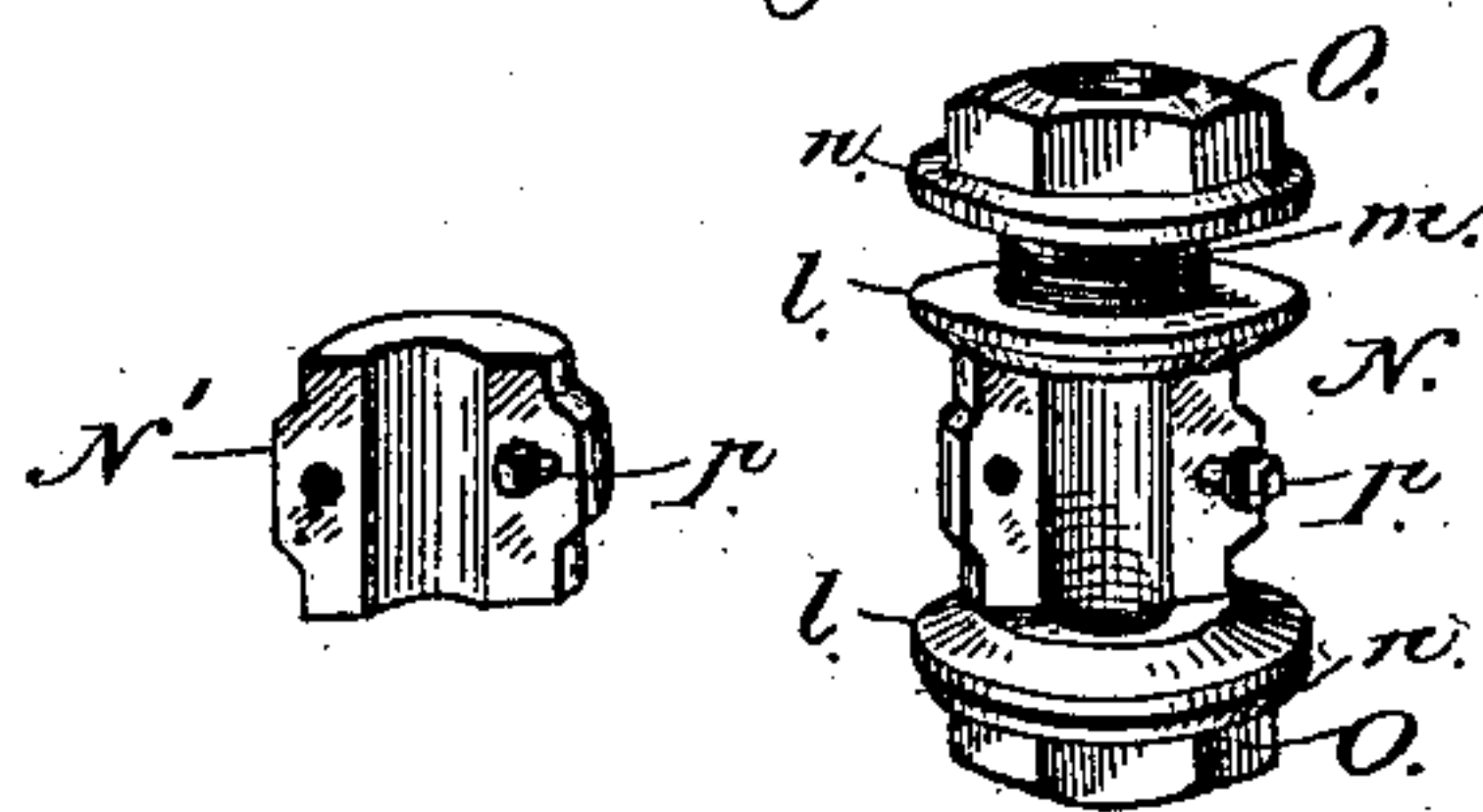


Fig. 9.



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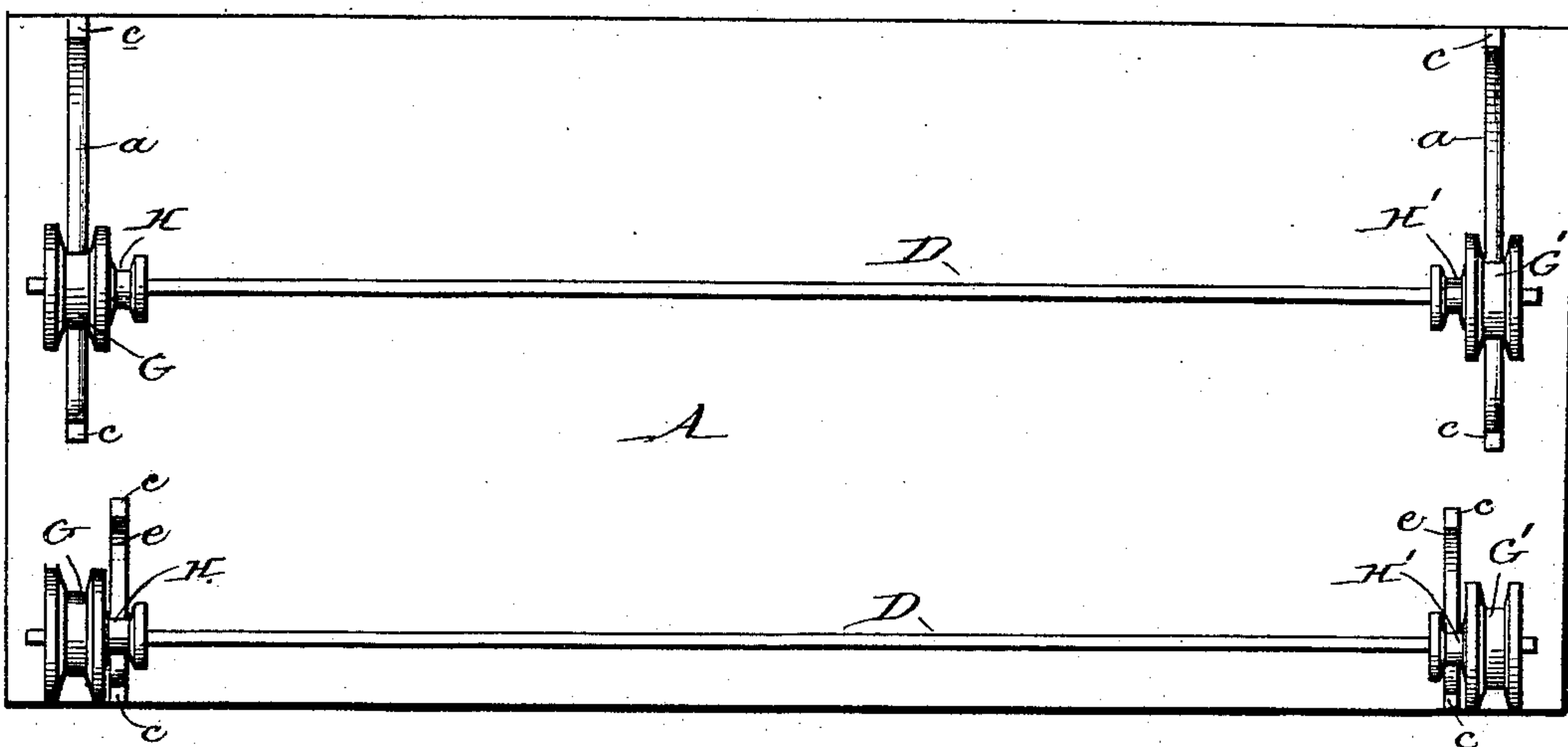
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Fig. 10.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY LLOYD BEACH, OF MONTROSE, PENNSYLVANIA.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 429,836, dated June 10, 1890.

Application filed April 16, 1889. Serial No. 307,510. (No model.)

To all whom it may concern:

Be it known that I, HENRY LLOYD BEACH, a citizen of the United States, residing at Montrose, in the county of Susquehanna and State of Pennsylvania, have invented certain new and useful Improvements in Sawing-Machines, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of a sawing-machine constructed according to my invention. Fig. 2 is a similar view showing the carriage removed, and showing one of the bearings for the saw-arbor swung outward. Fig. 3 is an enlarged perspective view of one end of the machine, showing the slitting-gage in position. Fig. 4 is a cross-sectional view showing in detail the means for clamping the slitting-gage to its rod or shaft. Figs. 5, 6, and 7 illustrate modified views of the rollers upon which the carriage is supported. Fig. 8 illustrates a detail of one of the track-irons on the main frame and carriage and the interposed rollers, which are adapted to travel thereon and to support the carriage. Fig. 9 represents details of the saw-carrying sleeve. Fig. 10 is a plan view showing the tracks on the bed-frame.

My invention relates to the class of wood-working machines, and especially to circular sawing machines, which are adapted for "slitting" and crosscutting purposes; and my invention consists of the constructions and combinations of devices which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains to make and use it, I will now describe its construction and indicate the manner in which I carry the same out.

In the accompanying drawings, A represents the main frame of the machine, constructed of suitable material and having at its corner portions the outwardly-extending lugs or flanges A', to which the track-irons B are bolted. These track-irons are located at each end of the machine, and each consists of a long track *a* at the front side and a short track *b* at the rear side, as shown more particularly in Fig. 8, and said tracks are formed or provided with the curved stops or abutments *c*, the purposes of which will be here-

inafter fully disclosed. Each track-iron B is provided with a horizontal web or flange *b'*, which greatly strengthens said iron, and serves as a medium by which the track-iron may be readily and securely bolted to the flange or lug A' of the main frame.

The saw-carriage frame C is provided with the saw-tables C' and C'', the former being permanently attached to said frame in any well-known manner, and the latter C'' being mounted on the frame C, so as to have a sliding movement, together with its adjustable saw, when different lengths of material are to be cut, and said movable table may be provided with the usual hand-screw *d*, as shown in Fig. 1, and the carriage-frame may be suitably "trussed" to prevent its springing at its center.

On the under side and near each end of the carriage are suitable short and long tracks *e* and *f*, which are so arranged with relation to the long and short tracks *a* and *b* on the main frame that the short tracks *e*, which are at the front ends of the carriage-frame, are over the long tracks *a*, and the long tracks *f*, which are at the rear end portions of the carriage-frame, are over the short tracks *b* of the main frame, the relation of the double series of tracks and the interposed traveling rollers or wheels being clearly shown in the detail, Fig. 8.

Upon reference to Figs. 2 and 3 it will be observed that between the carriage-frame and main frame are placed shafts D D', one at the front and the other at the rear of the machine, and these shafts extend longitudinally nearly or quite the full length of the machine, and carry at each end grooved or other rollers, which engage the tracks on the main frame and carriage-frame in a manner I will hereinafter fully describe.

The shafts D D' have no fixed bearings, and the rollers which they carry may be of various construction and engage the tracks of the carriage-frame and main frame, and traverse said tracks when the carriage is moved to and fro. To better define the construction of these supporting-rollers, I will refer to Fig. 5, where the shaft D or axis of the supporting-rollers has its ends reduced in size to receive the sleeves *g g'* of the rollers G G'.

The rollers G, which are located at one end of the shaft or axis D D', are secured on

the reduced portions thereof by set-screws passing through the sleeves *g*, and their external diameter is larger than that of the rollers *G'* at the opposite end of the shafts or axis *D D'*, but of the same diameter where they rest on the tracks, and the periphery of the rollers *G* is preferably grooved to fit the long tracks *a* on the main frame and the long track *f* of the carriage-frame at one end of the machine, while the rollers *G'* have plain peripheries, which engage the long tracks of the main frame and carriage-frame at the opposite end of the machine, these latter rollers being smaller than the rollers *G*, but of the same diameter as the rollers *G* at the base of the grooved portions of the latter and said rollers *G'*, sleeves fitting the reduced ends of the shafts or axes *D D'*, and being secured thereon by set-screws. Just inside of the rollers *G G'* the shafts or axes *D D'* are provided or formed with other and smaller rolls *H H'*, the former being preferably grooved or V-shaped in cross-section and the latter having plain surfaces; but it is obvious that all the rollers *G, G', H*, and *H'* may have grooved or plain peripheries without departing from the spirit of my invention, and without impairing the movement of the carriage which is supported by them.

The rolls *H H'* are designed to travel on the short tracks at the rear of the main frame and the short tracks *e* at the front of the carriage-frame, and their diameter is such relatively to the other rollers *G G'* that while these rolls *H H'* are traversing the short tracks the other rollers *G G'* are traversing the long tracks, and both series of rollers come to the limit of their movement against the stops at the same time.

In the practical construction of this machine I prefer to make the large wheels *G* about three times the diameter of the small wheels *H H'*, for the reason that I have plenty of room at the front of the main frame to enable me to employ a long track; but on the rear side of the main frame I use a short track, which enables me to materially decrease the width of the machine, whereby less room is required for the machine in the factory or mill. On the carriage, it will be observed, the tracks are reversed, and this is because I have but little room at the front of the carriage, but plenty of it at the rear of the same. If I should use wheels of the same diameter and rest the tracks on the carriage on the wheels, which also run on the tracks of the main frame, my tracks at the front and rear would all have to be of the same length, which construction would necessitate my making the machine much wider than I now do, because the carriage when drawn forward would project so much in front of the rolls that the placing of a heavy plank upon said carriage would overcome the weight of the rear of the carriage, and thereby tip said carriage forward; but when the machine is constructed according to the principles I

have previously laid down it is obvious the weight of the material to be sawed is always between the front and back wheels at all times, for it will be understood that when the carriage is pushed forward the wheels move on their tracks toward each other. Therefore the danger of the weight of the material upon the carriage overcoming the latter and tipping it forward is entirely avoided.

As before described, the rollers or wheels have no fixed bearings. Therefore there is but little friction, and actual experiment has demonstrated the fact that a plank weighing five hundred pounds can be carried toward and from the saws with a pressure of about one pound, so nicely is the carriage hung upon its rolling bearings.

The stops at the end of the tracks have their inner faces preferably curved to form a seat for the rollers, and these stops serve a threefold purpose. First, they prevent the carriage running off or being pushed off the machine; second, should either of the wheels at the ends of the shafts or axes slip a trifle on its track, whereby a wheel or roller at one end would be a little in advance of the wheel or roller at the opposite end of the same shaft or axis, the stops would bring the advanced wheel or wheels back into their relative positions with the frame each time the carriage is moved back and forth, whereby said wheels work true and square with the frame and carriage, and, third, in removing the saws from the arbor the carriage is moved as far front as it will go and the back edge raised up, the stops forming a hinge about which the carriage turns.

Instead of employing the construction of wheels and shaft shown in Fig. 5, I may use the form shown in Fig. 6, where the shaft or axis *D* is of uniform diameter throughout. In this case the inner face of the sleeve will be beveled, and the adjoining face of a collar or sleeve *I*, adjustably secured on said shaft, will also be beveled. That portion of the shaft or axis *D* between the beveled faces of the sleeves now serves as the smaller rolling surface for the track, and at the opposite end of the shaft the sleeve of the wheel *H* is done away with, the shaft itself at this point also being the smaller rolling surface of the track.

In Fig. 7 I illustrate another mode of supporting the carriage. In this instance the grooved wheel rests upon the main-frame track, the carriage-track also resting on said wheels. The shafts *D D'* in this case are done away with, the wheels being loosely placed, and the hub of the wheel extends outwardly and forms an annular beveled bearing-surface 5, terminating in short cylindrical surfaces 6. The carriage-track in this latter instance is double, instead of being separate and individual tracks, and its faces, which work against the surfaces 5 and 6, are made to correspond therewith, whereby the danger of lateral displacement is avoided.

Secured to the frame of the machine at one

end is a casting J, in the upper portion of which is formed bearings for one end of the saw-arbor K, which carries in the casting J the band-pulley J', the said arbor extending
 5 nearly the full length of the machine and having its opposite end beveled or conical in form and adapted to be seated in a conically-formed seat in the box or bearing L, forming a part of the casting M, which sustains this
 10 end of the arbor. This casting M, instead of being permanently fixed in position, is mounted on a pivot-bolt 8, and is adapted to be swung outward, as shown in Fig. 2, to permit the removal of the saws when desired, the casting
 15 being swung into position when desired to support the end of the arbor, and being held in a locked position by a screw-bolt or other means. Upon the saw-arbor the saw-carrying sleeve N is mounted, and this sleeve is
 20 cast in two pieces, one piece being cast with solid collars *l* and has an integral threaded portion *m* at each end, upon which the flanged nuts O are secured, the other piece or section of the sleeve being the cap-piece. The
 25 flanges *n* of the nuts correspond with the collars *l*, and between them and said collars the saws are held. In casting this sleeve the center is cored out its entire length. The cap-piece N' is then fitted in position to make a
 30 tight joint, and the two parts of the sleeve are bolted together by bolts P, passing in opposite directions, to wit: one bolt being passed loosely through the cap-piece and screwed into the sleeve portion proper and the other
 35 bolt passes loosely through the sleeve portion and screws into the cap-piece. The sleeve is now placed in a lathe and bored out to fit the arbor, and then placed on a mandrel and turned true to insure a perfect balance, which
 40 is necessary in the running of saws. The cap-plate may now be again bolted to the sleeve and the completed sleeve slipped endwise upon the arbor. It will now be seen that the sleeve being thus put upon the arbor the tightening of the bolts P (which are
 45 opposite each other to preserve the balance) will securely clamp the sleeve to the arbor, and thereby hold the saw or saws in any adjustable position on said arbor, and when desired to readjust the saws it may be done by
 50 slightly loosening one of the bolts and slipping the sleeve and saws along the arbor to its desired new position.

The sleeve shown in Fig. 9 is a double one,
 55 or designed to carry a saw at each end, so as to permit that end of the sleeve which carries the saw nearest the saw on the stationary table to be brought close to the stationary saw for cutting short pieces of material, and
 60 when it is desired to cut the longest possible length the movable saw is placed, as shown in Fig. 2, between the collars on that end of the sleeve which is farthest from the stationary table and the stationary saw between
 65 the saw-holding collars *l'* *n'*. The sleeve may be made to carry but one saw, if desired, and this may be done by dispensing with one of

the threaded ends and flanged nuts. The stationary and movable tables may be provided with stop-gages L', which have their
 70 front surfaces planed straight. Near the inner ends these gages are formed with offsets L'', which are made with openings into which the front edges of the saws pass after passing through the material. The stop-
 75 gages extend inwardly beyond the offsets, as shown at *r*, to support the board when the saws have been placed on the inner ends of the sleeve and between the saw-holding collars on the arbor at the inner end of the cast-
 80 ing J, this being the position of the parts when cutting short pieces of material. For instance, when the saws are placed on the adjacent edges of the two tables for cutting short lumber there would ordinarily be no
 85 support for the lumber after it had passed between the saws; but extensions *r* remove the difficulties and form a rest for the plank after it has been severed. To make this point
 90 more plain, I will say that if a board is placed on the tables and passed between the saws, as shown in Fig. 1, it will have the whole
 length of both gages to rest against. Now place the saws at the inner sides of the tables and pass the board between the saws, and
 95 after being severed the board will have the extensions *r*, or that part of the gage beyond the openings, for the board to rest against, and if these gages do not extend beyond the
 100 openings in the offsets there will be nothing to hold the piece in place, and while the operator is moving the carriage back the board will turn a trifle and catch the back of the saw, and thereby make it very dangerous
 105 work. The stop-gages have a plate or bed-piece *s* let into the table in the usual manner, so that they may be moved forward or back as is necessary when cutting lumber of different thickness or width.

As before stated, this machine is adapted
 110 for both crosscutting and slitting or "ripping" purposes, and when used for slitting or ripping lumber the carriage is securely locked to the main frame in any suitable
 115 manner and the sawing done in connection with the gage illustrated in Fig. 3. This gage comprises a rod or shaft M', which is supported upon lugs or arms *t*, bolted to the under front side of the carriage-frame and
 120 having their outer portions formed with curved seats *u*, which receive the face of the cylindrical rod or shaft M', which extends along the front of the table below its top and projects somewhat beyond its inner end.

N'' is a casting hollowed out on its under
 125 side to fit the rounded upper surface of the rod or shaft M', along which it extends for some length to give it a firm bearing on said rod. This casting N'' has also two upwardly-extending arms *w* *w'*, to one of which one
 130 end of the gage-block O' is directly bolted, and to the other *w'* is connected a brace-arm *x*, which extends diagonally from the arm *w'* to near the opposite end of the gage-block, as

shown in Fig. 3. A clamping-plate P, having a curved face where it meets the rod or shaft M' and a beveled outer end, as shown at y, is fitted into the beveled recessed extension of the casting N'', and is also provided with a bolt α' , which is preferably cast with the clamping-plate P and extends upwardly through a hole in the lateral extension of the casting N'' and through the head of a lever Q, and is then secured by a nut, as shown more particularly in Fig. 4. The upper face of the lateral extension is formed with a projection having an inclined plane b'' and the meeting face of the lever Q is likewise formed, whereby when the lever is turned the clamping-plate is drawn into its recessed seat to clamp the plate P tightly against the rod or shaft M', and thereby hold the gage in position.

By making the bottom of the casting N'' concaved or hollowed out, so as to snugly rest upon the upper portion of the round shaft or rod M', it assures a perfect alignment of the gage-block with the saw. For instance, when moving the gage toward and from the saw I loosen the clamping-plate by turning the lever Q so as to permit the gage to slide on its rod or shaft M', and as the concaved face of the casting-gage N rests directly upon the rod or shaft M' it keeps the gage-block in a perfect line, from which position it cannot be accidentally turned, as by the subsequent clamping of the parts. The clamping device, it will also be observed, is placed below the top of the table and in front of the face of the gage-block, which position is important, as it permits the gage to be successfully operated in connection with material even wider than the table, as the gage may be moved to the extreme inner end of the rod or shaft M', and the clamp being in front of the gage-block the latter may be held in this extreme position without difficulty. Another point is that the concaved faces of the casting N'' and clamping-plate P permits the gage being removed almost instantly from the rod or shaft M' by slipping the gage-casting endwise therefrom.

The machine thus described is simple in its construction, contains but few parts liable to get out of repair, can be cheaply constructed, and possesses many advantages which will be appreciated by the practical workman.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the main frame having long and short fixed tracks at opposite ends, of the carriage having similar tracks on its under surface and rolling bearings of different diameters between the carriage and main frame and traversing the tracks of both main frame and carriage.

2. The combination, with the main frame having long and short tracks at opposite ends, of a carriage supported above the main frame and having similar tracks reversely arranged with relation to the frame-tracks, and the wheels or rolls of different diameters between the main-frame and carriage tracks and moving simultaneously said wheels or rolls, having no fixed bearings, substantially as herein described.

3. The main frame having the long and short tracks secured to its end portions, with the long tracks at the front and the short tracks at the rear, in combination with the reciprocating carriage having long and short tracks secured to its under surface near the ends, and having the short tracks in front and the long tracks at the rear, wheels or rolls of different diameters between the long and short tracks, having no fixed bearings, said wheels being connected together so that they move in unison, substantially as and for the purpose described.

4. The main frame having fixed tracks secured to its end portions and the reciprocating carriage having like tracks, said tracks having curved stops at the ends thereof which limit the movements of the carriage and serve as a means for tilting the carriage, in combination with wheels or rollers between said tracks and supporting the carriage, substantially as herein described.

5. The main frame with its long and short tracks at the front and rear portions of its ends, the carriage having the long and short tracks reversely arranged with relation to the frame-tracks, curved stops at the ends of the frame and carriage tracks, the shafts extending along the front and rear of the main frame, but having no end bearings, and the wheels or rollers of different diameters carried by the shafts at the ends and engaging the tracks of the main frame and carriage, substantially as described.

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