

(No Model.)

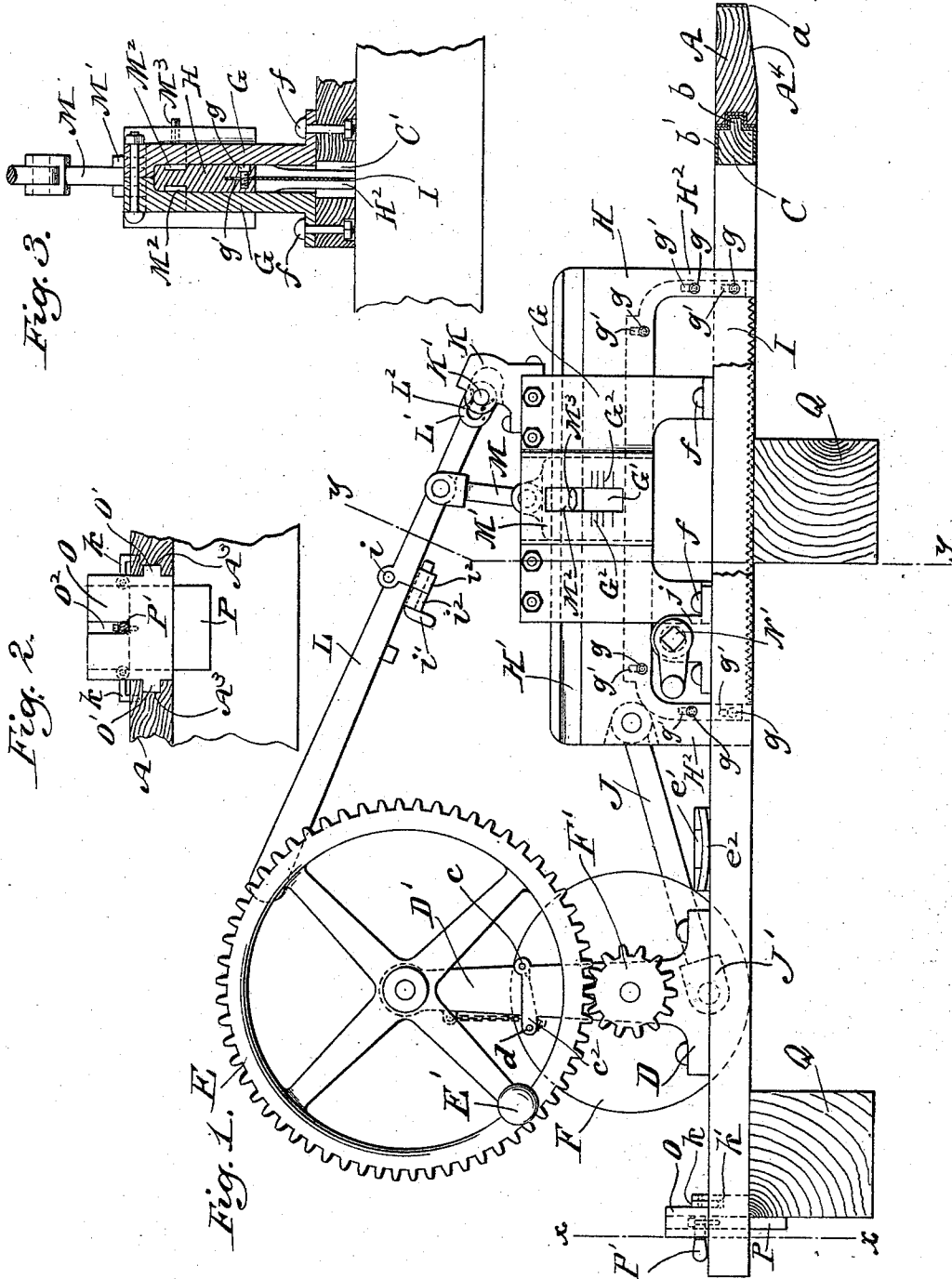
3 Sheets—Sheet 1.

R. J. ORR.

SAWING MACHINE FOR FORMING NOTCHES IN BEAMS.

No. 535,919.

Patented Mar. 19, 1895.



Witnesses
John K. Deemer
Frederic D. Griffith

Robert J. Orr Inventor
By *Edgar Tate & Co* Attorneys

(No Model.)

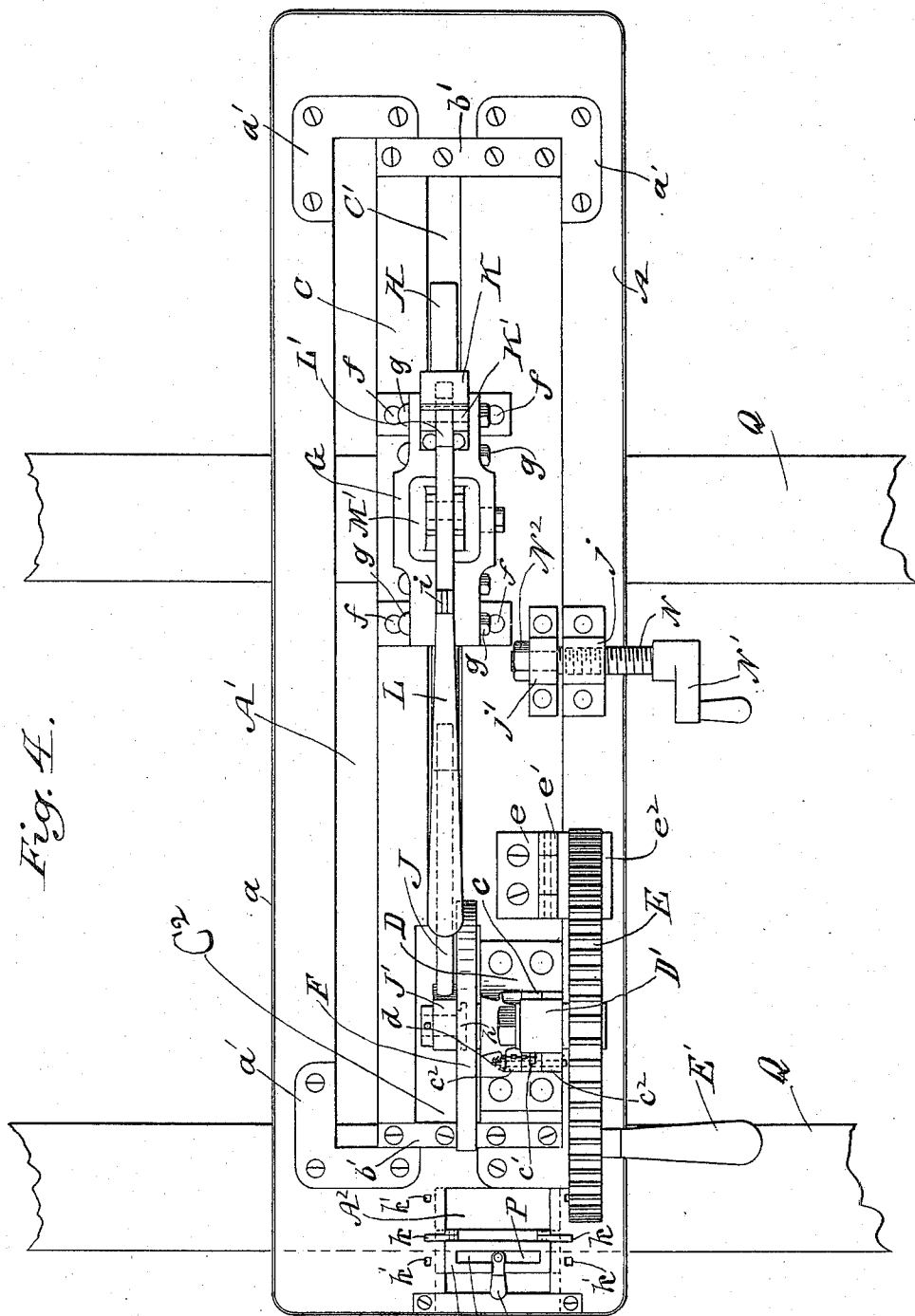
3 Sheets—Sheet 2.

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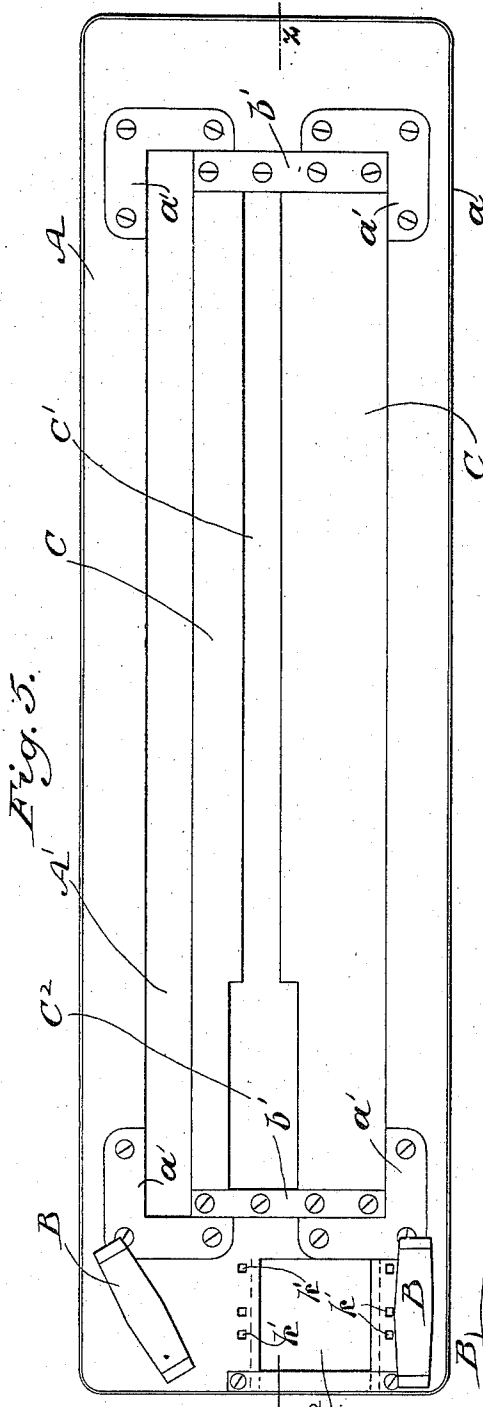


Fig. 5.

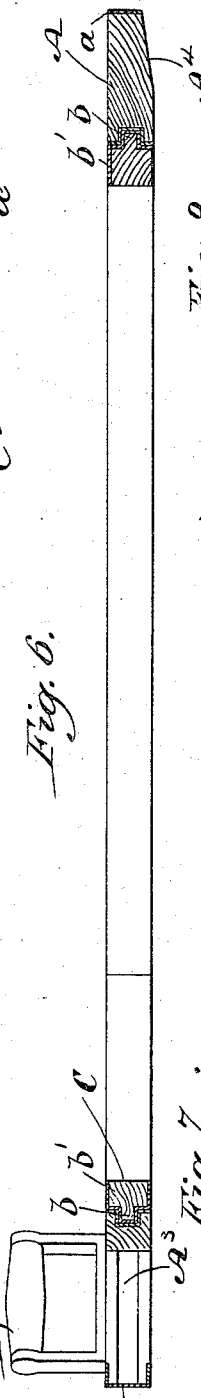


Fig. 6.

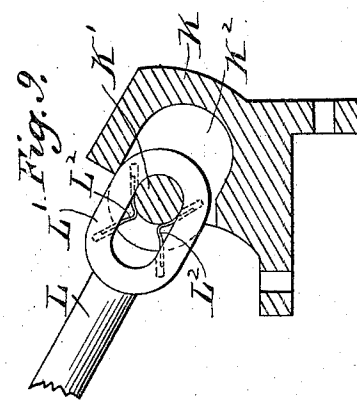


Fig. 9.

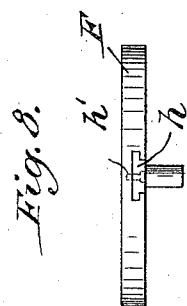


Fig. 8.

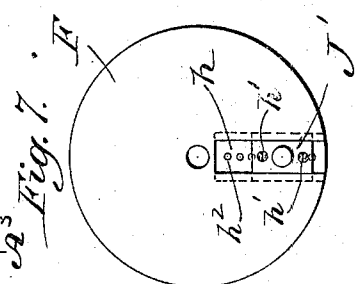


Fig. 7.

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UNITED STATES PATENT OFFICE.

ROBERT JOSEPH ORR, OF NEW YORK, N. Y.

SAWING-MACHINE FOR FORMING NOTCHES IN BEAMS.

SPECIFICATION forming part of Letters Patent No. 535,919, dated March 19, 1895.

Application filed June 5, 1894. Serial No. 513,533. (No model.)

To all whom it may concern:

Be it known that I, ROBERT JOSEPH ORR, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sawing-Machines for Forming Notches in Beams, of which the following is a specification.

This invention relates to sawing machines and has for its object to provide a device of this character by means of which a notch or depression of any width may be formed in one or more of the beams of a floor for the reception of gas or other pipes, electric wires or the like.

My invention consists not only in the novel construction and arrangement of parts hereinafter fully described, but also broadly in the production, as a new article of manufacture, of a sawing machine applicable to, and capable of being held securely upon, the cross beams of a building, and the frame of which is so formed and arranged as to permit of lateral movement of the saw-blade to sink the two parallel cuts or slots necessary to form the notch.

In the accompanying drawings, forming part of this specification, in which like letters of reference designate corresponding parts throughout, Figure 1 is a side elevation of a sawing machine embodying my invention, resting upon two of the beams of a building, the rear end of the said machine being partially broken away. Fig. 2 is a partial section upon the line $x-x$, Fig. 1. Fig. 3 is a section taken on the line $y-y$, Fig. 1. Fig. 4 is a plan view of the machine. Fig. 5 is a plan view of the bed plate. Fig. 6 is a longitudinal vertical section taken upon the line $z-z$, Fig. 5. Fig. 7 is a side elevation of the crank wheel or disk forming part of the invention. Fig. 8 is an edge view or inverted plan thereof. Fig. 9 is a detail view upon a central sectional line of the joint or locking device at the rear of the depressing lever.

In the practice of my invention, I construct a bed plate A, preferably formed of oak or other hard wood, and surrounded by a metallic facing a , which may also if desired extend upon the under face of the said plate to avoid wear. This plate is cut out at the center throughout a considerable portion of its length

and width, to leave an aperture A', the corners of which are also provided with metal facings a' which latter extend upon the top, the interior and the bottom of the plate at the said corners to also serve as braces and to strengthen the device. At either side of the bed plate A at the forward end thereof, I secure handles B, preferably arranged as shown in Fig. 5, for convenience.

Sliding laterally in the bed plate A is a plate C, of such a length as to extend from one edge of the aperture A' to the opposite end thereof, and of a width perhaps one fifth less than that of the said aperture, the said plate C thereby being permitted to move toward either side of the bed plate A. Near one side of this plate C, in such position as to align with the center of the aperture A' when the plate C is in the position shown in Fig. 5, is a longitudinal slot or groove C', abruptly widening near the forward end to form an aperture C². The ends of the plate C are provided with tenons or tongues b which are covered, in common with the said ends, by a metallic sheeting b' , which also serves to secure the two sides of the plate C intervened by the grooves C' rigidly together, the said tenons fitting in the edges of the bed-plate at each end of the aperture A' which said edges are grooved for their reception.

Bolted to the plate C is a standard D, having journaled in the top thereof a driving wheel E, which is peripherally toothed and meshes with a pinion F' journaled in the lower end near the base of the standard and having rigidly mounted upon the same journal thereof at the opposite side of the bearing, the crank wheel or disk F. The driving wheel E is rotated by means of a crank or handle E' thereon. This standard is transversely divided near the center to comprise the lower portion or base D, and an upper portion D', these being secured together upon the innermost side by means of a hinge e , the upper section D' having upon the lower end thereof, at the side opposite the hinge, a tubular lug c' which passes between two similar lugs c^2 upon the upper end of the base, the two being secured by a pin d passing there-through and fastened to the upper section to prevent loss thereof. When the machine is not in use, by removing this pin d , the upper

section D' may be swung downwardly in such manner that the driving wheel E will rest upon the bed plate A for greater convenience, and to reduce the bulk of the machine. To the end that this wheel on being depressed will not cut into the bed plate, I secure upon the plate C a rest e , which is bolted to the said plate C and extends over upon the plate A. The rest is hinged at the center at e' so that the free or forward end e^2 of this rest may be folded over in order not to interfere with the sliding of the plate C when the machine is in use. This forward end e^2 of the rest e is concaved in its upper face to correspond with the contour of the wheel E.

Immediately beyond the center of the device, at either side of the aperture C', I mount upon the plate C by means of bolts f standards or bearings G, at such distance from each other as to permit the saw carrier H to slide therein, and bolted together at the top, where they meet. The saw carrier H is longitudinally grooved at H' on either side thereof near the top and has at each end downwardly projecting legs or extensions H², between which is placed the saw blade I, which extends into the said legs H² and upwardly into the body of the carrier H, the said blade being secured by bolts g which pass through the said corner and the extensions and through elongated bolt holes g' in the blade I, thereby permitting vertical adjustment of the saw blade.

At the forward end of the carrier H is pivoted a connecting rod J, the opposite end of which is secured to the crank wheel or disk F, whereby the said carrier is reciprocated as the said disk is rotated. As more particularly shown in Figs. 7 and 8, this disk has a dove-tailed or tenoned groove h extending from the under side thereof toward the center, the said groove passing but half way through the said disk laterally, and the said connecting rod J having thereon a substantially rectangular collar J', which is inserted in the groove h and is adapted to slide therein. The said collar may be secured either near the center of the disk or toward the outer periphery thereof, by adjusting the said collar J' in the groove h , and securing the same at the desired position by means of screws h' , which extend through the collar and into two of the screw-threaded holes h^2 which are formed in the disk behind the groove.

Toward the rear of the standards G upon the top thereof, is secured a bearing K, in the front of which is pivoted by means of the journal K', a lever L, which has an elliptical loop L' on the end thereof, surrounding the journal and held thereon by means of the approximately L-shaped springs L² which are embedded in the sides of the loop and point inwardly toward each other.

Rearward of the journal K' the bearing K has therein a depression K², in which the loop L' is adapted to rest when forced therein by

pressing the lever L substantially horizontally or obliquely, the springs L² upon the said loop being pressed inwardly and passing the journal K', the lever L thus being locked and movement thereof prevented, after the loop descends to the bottom of the depression K². This lever is jointed at the center, the two sections thereof being secured by a hinge i and held securely together by means of a movable pin i' , which passes through tubular lugs i^2 upon the two sections of the said lever.

Pivoted to the lever L, near where the same is journaled, is a short rod or pitman M, having pivoted upon the end thereof a plunger head M' which extends between the bearings G at the center, which are cut out for that purpose, the said plunger head being substantially double L-shaped in vertical section and having upon the interior thereof at each end tongues M² which engage in the grooves H' in the top of the saw carrier H. In one of the bearings G near the center is a vertical slot G', at either side of which are marked graduations or measuring lines G² and the plunger head M' has at one side thereof a pointer M³, which slides in the slot G' and serves to indicate, in conjunction with the graduations G², the depth at which the saw is sunk from time to time.

Upon the bed plate A, and the plate C at the sides thereof upon which the driving wheel is journaled, are secured bearings j and j' respectively, the former which is mounted upon the plate A being interiorly screw-threaded, and the latter, which is upon the plate C, having a smooth bore of appreciably less diameter than that of the bearing j . Journaled in these bearings is a short shaft N, having thereon a crank N', the said shaft being screw-threaded from the shank of the handle to its point of junction with the bearing j' upon the plate C, where it is decreased in diameter and smooth peripherally to correspond with the bore of the said bearing j' ; and beyond the said bearing the end of the said shaft is again screw-threaded and has mounted thereon a nut N². As thus constructed, when the crank N' is rotated the plate C will be shifted laterally. The said crank N' preferably has a square bore, the shaft being also square at the end which enters the said crank, to render the same removable.

At the forward end of the bed plate A is a substantially square aperture A², the edge of which nearest the center of the bed plate is in exact alignment with the saw blade I in its first position, or that shown in the drawings, both the said first position of the blade and the edge of the aperture being preferably, for greater accuracy, arranged at the exact central line of the bed plate. At either side of the aperture A² the edge of the bed plate A has formed therein longitudinal grooves as shown at A³, sliding in which is a clamp O provided with tongues or tenons O', engaging and sliding in the grooves, the said clamp hav-

ing pivoted at the rear thereof hooks h , which are adapted to enter slots h' at each side of the aperture A^2 , thereby holding the said clamp O either near or away from the front end of the bed plate A . This clamp O is vertically apertured at the center and provided with a slot O^2 at the front thereof. Mounted in the clamp in such manner as to move perpendicularly therein is a slide P , having pivoted upon the top thereof a handle P' , which when turned to point forwardly slides in the slot O^2 in the front of the clamp O , and adapted when raised to carry with it the said slide P . When the said slide is raised to the level of the under surface of the bed plate A , the handle P' may be given a half revolution whereby the same is turned in such manner as to rest upon the top of the clamp O at the rear thereof, thus maintaining the slide P in the raised position.

The operation of the device will be clearly understood from the foregoing description taken in connection with the accompanying drawings. In sawing beams in which to lay gas or other pipes, it is customary to mark a chalk line across the beams to serve as a guide in sawing the notches, and this having been effected, my machine is laid upon the beams to be sawed, the slide P is permitted to fall by turning the handle P' to point forwardly, and the machine is forced across the beams by means of the handles B until the slide abuts against the side of the beam Q next adjacent to the beam to be sawed. The bed plate A is then moved laterally until the edge of the aperture A^2 at the center of the plate aligns perfectly with the chalk mark upon the beam beneath, when the saw blade I will be found to align with the chalk mark upon the beam to be sawed. The saw is then reciprocated by rotating the driving wheel E by means of the crank E' on the said wheel, thereby, through the said agency of the pinion F' , rotating the disk or crank wheel F which imparts such a motion to the connecting rod J as to reciprocate the saw carrier H in the bearings G , thereby forcing the saw blade I across the surface of the beam Q . The saw is held firmly upon the beam by pressing the lever L , which by means of the rod M , and the plunger head M' thereon, engaging with the saw carrier, tends to force the said carrier downwardly, but by reason of the grooves H' in the top thereof being formed throughout the entire length of the carrier, does not interfere with the reciprocation of the same.

As the operation of the machine progresses and the cut formed in the beam increases in depth, the saw blade will sink beneath the upper surface of the beam, and the plunger head be correspondingly depressed, the plunger M^3 thereof indicating, by means of the graduations G^2 , the depth at which the saw rests. By this means the slits may be cut to a uniform depth according to the diameter of the pipes to be laid in the beams. The first cut having been made, the lever L is raised

to withdraw the saw from the slit made, and the crank N' is then turned, thereby rotating the screw shaft N and forcing the plate C , with the saw and actuating mechanism, toward the side of the bed plate A opposite that to which the said screw shaft is journaled, the said shaft being rotated until the screw rests at the proper distance from the cut already made, and this having been determined the machine is again operated through the agency of the crank E' , whereupon a second slit parallel with the first is formed by the saw blade I , and sunk to the same depth as the first. This having been effected, the strip of wood intervening the two slits is then removed by means of a chisel, hammer or similar means, and the necessary notches if such be desired, having been formed in the adjacent beams by the same operation as that above described, the gas pipe, electric wire or other device which the notches are to receive are then laid therein, and the operation is ended.

The advantages resultant from the use of my invention will be manifest, particularly to such as are conversant with the particular class of machines to which my invention appertains, or who are experienced in the formation of notches in beams, since by its use there is provided a simple, comparatively cheap, readily constructed, and perfectly operating machine, which may be rested upon two or more of the beams of a building, and in which, by the mere rotation of a wheel, the saw may be rapidly, and vigorously reciprocated; may by pressing a lever be automatically brought into engagement with the beam from time to time as the operation is continued; may be instantaneously withdrawn from the slit already formed; by the simple movement of a crank be shifted to form a minutely parallel slit adjacent to or removed from the first; also for the reason that the saw may be readily adjusted by means of the bolts g and the bolt holes g' to provide for any wear upon the edge of the blade; and for the further reason that the projecting parts of the machine may be readily folded downwardly or upon themselves, to render the device compact and ready for transportation.

The swing and working surface of the saw blade I may be increased or decreased by moving the collar J' either outwardly or inwardly in the groove h formed in the disk F , thereby regulating the throw or horizontal movement of the connecting rod J , with corresponding effect upon the saw carrier.

Many minor improvements, additions or variations may be made in the machine as hereinbefore described and illustrated, without materially altering or affecting the character of the invention; as for example, the rear end of the bed plate A may be beveled upon its under surface as shown at A^4 in Fig. 1 to facilitate the shifting of the machine from one beam to another. I therefore do not confine myself to the exact form and details of construction set forth.

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

1. A sawing machine comprising a bed plate adapted to rest upon one or more beams of a building, a plate sliding laterally within the same, a saw blade sliding in the inner frame, a lever adapted to press the saw downwardly, means for reciprocating the said saw blade, and a screw shaft connecting the two plates and adapted to shift the inner plate, laterally, substantially as shown and described.

2. A sawing machine comprising a bed plate adapted to rest upon one or more beams of a building, a plate sliding laterally therein and slotted longitudinally, a saw blade working in the slot and extending therethrough, a lever at the top of the saw to force the same downwardly upon the beam, connections from the saw to a driving wheel adapted to reciprocate the said carrier, a screw shaft connecting the two plates together and adapted when rotated to shift the inner plate laterally, substantially as shown and described.

3. A sawing machine comprising a bed plate adapted to rest upon one or more beams of a building, an inner plate sliding laterally therein, a longitudinal slot in the inner plate, a saw carrier sliding in the said slot and having a saw blade mounted therein, a lever journaled at the top of the carrier and pivotally connected therewith, a rod pivoted to the carrier and connecting to a driving wheel adapted to be rotated and to reciprocate the saw carrier, and a screw shaft journaled in bearings on the bed plate and the inner plate, and adapted when rotated to shift the said inner plate laterally, substantially as shown and described.

4. A sawing machine comprising a bed plate, an inner plate sliding laterally therein, a longitudinal groove in the said inner plate, bearings at either side of the groove, a carrier sliding in the said bearings and having a saw blade mounted therein, a lever journaled at the top of the bearings and connected by means of a pivoted rod to the carrier, whereby the said lever may depress the same, a connecting rod pivoted to the said carrier and to a crank wheel journaled near one end of the device, a driving wheel adapted to rotate the said crank wheel and thereby reciprocate the saw carrier, and a screw shaft journaled in bearings upon both the bed plate and the inner plate, having a crank thereon and adapted when rotated to shift the inner plate laterally, substantially as shown and described.

5. A sawing machine comprising a plate longitudinally slotted, bearings at either side of the said slot, a saw carrier sliding therein and extending through the said slot, a saw blade mounted in the said carrier, a lever journaled at the top of the bearings and connected to a plunger head movably secured to the saw carrier, and adapted when the lever is depressed to force the saw blade downwardly upon the beam, a connecting rod pivoted to the said car-

rier and to a crank wheel journaled near one end of the device, a pinion upon the same journal as the said crank wheel, and a driving wheel meshing therewith, having a crank thereon, substantially as shown and described.

6. A sawing machine comprising a plate longitudinally slotted, bearings at either side of the slot, a saw carrier sliding therein and extending through the said slot, a saw blade mounted in the said carrier and vertically adjustable, a lever journaled at the top of the bearings and connecting by means of a vertical rod to a plunger head claspings the top of the carrier and working in grooves therein, a pointer upon the plunger head adapted to indicate the depth of the saw, a connecting rod pivoted to one end of the carrier and adjustably connected to a crank wheel journaled in bearings near one end of the device, a pinion mounted upon the same journal as the crank wheel, a driving wheel journaled above the said pinion and meshing therewith, and a crank upon the driving wheel to rotate the same, substantially as shown and described.

7. A sawing machine comprising a bed plate, an inner plate sliding laterally therein, a longitudinal slot in the said inner plate, bearings at either side of the slot, a carrier sliding in the said bearings, a saw blade mounted therein in such manner as to be vertically adjustable, a lever journaled at the top of the bearings and connecting by means of a pivoted rod to a plunger head claspings the top of the carrier and working in grooves therein, a pointer upon the plunger head adapted to indicate the depth of the saw, means for locking the lever, a connecting rod pivoted to one end of the carrier and adjustably connected to a crank wheel journaled in bearings near one end of the device, a pinion mounted upon the same journal as the crank wheel, a driving wheel above the said pinion and meshing therewith, a crank upon the driving wheel to rotate the same, and a screw shaft adapted to shift the inner plate when rotated, substantially as shown and described.

8. A sawing machine comprising a bed plate, an inner plate sliding laterally therein, a longitudinal slot in the said inner plate, bearings at either side of the slot projecting upwardly therefrom, a carrier sliding in the said bearing and having extensions at each end thereof, a saw blade mounted in the carrier between the extensions in such manner as to be vertically adjustable, a lever journaled at the top of the bearings and adapted to be locked therein, the said lever being formed in two sections and adapted to be folded over, a rod pivoted to the said lever near where it is journaled, and to a plunger head claspings the top of the carrier and working in longitudinal grooves at either side thereof, a pointer upon the plunger head adapted to indicate the depth of the saw, a connecting rod pivoted to one end of the carrier and adjustably connected to a crank

5 wheel journaled in bearings near one end of
 the device, a pinion mounted upon the same
 journal as the crank wheel, a driving wheel
 above the said pinion and meshing therewith,
 10 a crank upon the driving wheel to rotate the
 same, a screw shaft journaled in bearings
 upon the bed plate and the inner plate where
 they adjoin, the said screw shaft being so
 constructed and journaled as to shift the in-
 15 ner plate laterally when rotated, and a guide
 at the end of the bed plate adapted to engage
 with the side of the beam and hold the device
 in position, substantially as shown and de-
 scribed.

15 9. A sawing machine comprising a bed plate
 adapted to rest upon one or more beams of a
 building, an inner plate sliding laterally
 therein, a longitudinal slot in the said inner
 plate, bearings at either side of the slot, a car-
 20 rier sliding in the said bearings and having ex-
 tensions at either end thereof, a saw blade se-
 cured in the said carrier between the exten-
 sions by means of bolts, the said saw having
 elongated bolt holes therein to permit of ver-
 25 tical adjustment thereof, a lever journaled at
 the top of the bearings and adapted to be
 locked in position, the said lever comprising
 two sections hinged together and secured by
 means of a pin, a rod pivoted to the said lever
 30 near where it is journaled and to a plunger
 head clasp the top of the carrier and work-
 ing in longitudinal grooves at either side
 thereof, a pointer upon the plunger head work-
 ing in a slot in the bearings and adapted to

indicate the depth of the saw, a connecting 35
 rod pivoted to the carrier at one end and to a
 crank wheel at the other, the said rod being
 adapted to be adjusted at varying distances
 between the center and the edge of the said
 crank wheel, a standard secured to the inner 40
 plate and having the crank wheel journaled
 therein, the said standard being formed in
 two sections hinged together and adapted to
 fold vertically, a pinion mounted upon the
 same journal as the crank wheel, a driving 45
 wheel journaled in the top of the standard
 and meshing with the pinion, the said driving
 wheel being adapted to rest upon the plate
 when the standard is folded, a screw shaft
 journaled in bearings secured to the bed plate 50
 and to the inner plate at their adjoining
 edges, the said shaft having a crank thereon
 and being so constructed and arranged as to
 shift the inner plate laterally when rotated,
 and a guide secured to one end of the bed 55
 plate, having a slide depending from the
 same, vertically movable therein, and adapted
 to bear against the side of one of the beams,
 substantially as shown and described.

In testimony that I claim the foregoing as 60
 my invention I have subscribed my name, in
 presence of two witnesses, this 4th day of
 June, 1894.

ROBERT JOSEPH ORR.

Witnesses:

PERCY T. GRIFFITH,
 C. GERST.