

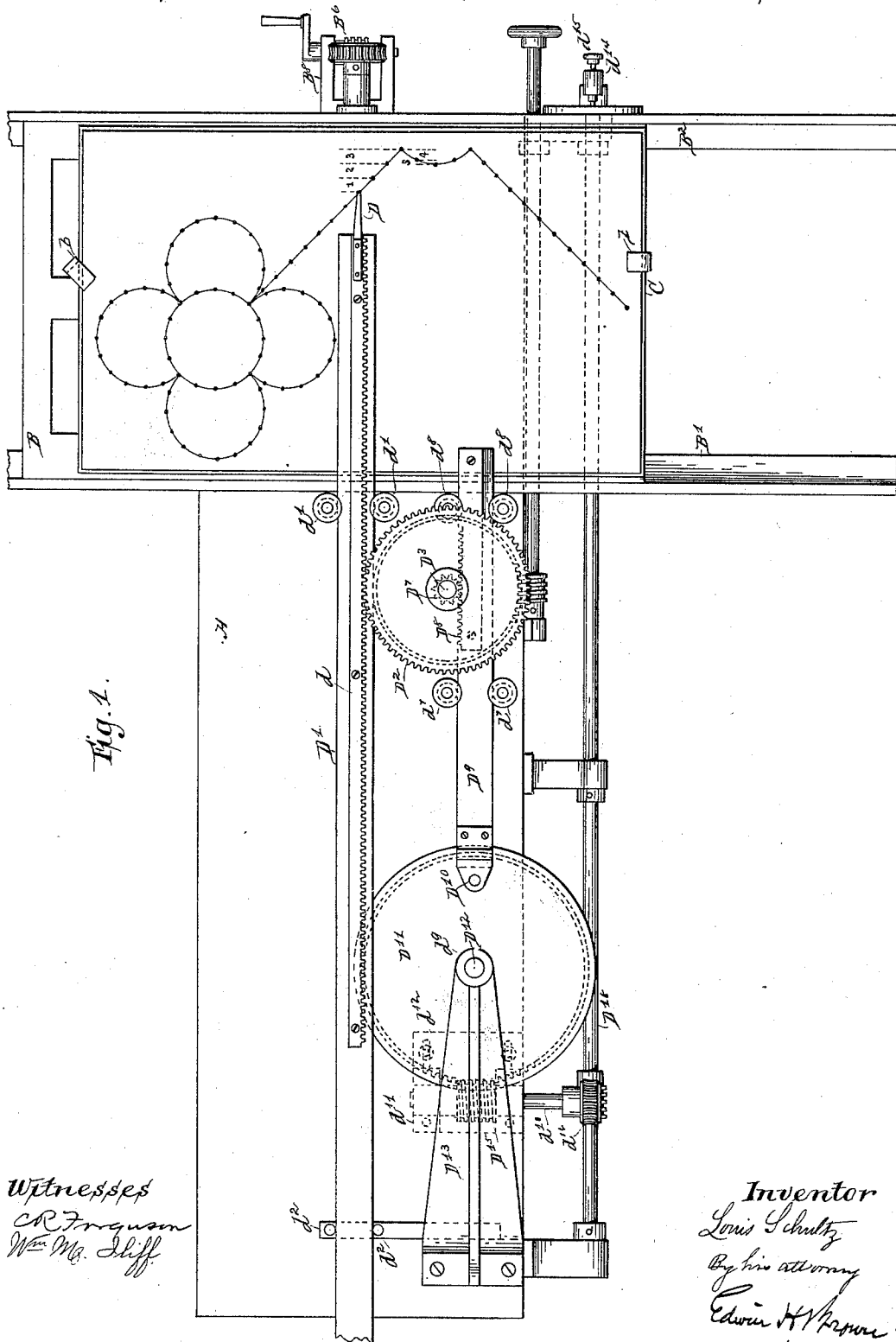
(No Model.)

2 Sheets—Sheet 1.

L. SCHULTZ.
MACHINE FOR LAYING OUT CAMS.

No. 466,758.

Patented Jan. 5, 1892.



Witnesses
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Wm. M. Duff

Inventor
Louis Schultz
By his attorney
Edwin H. Brown

(No Model.)

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Fig. 2

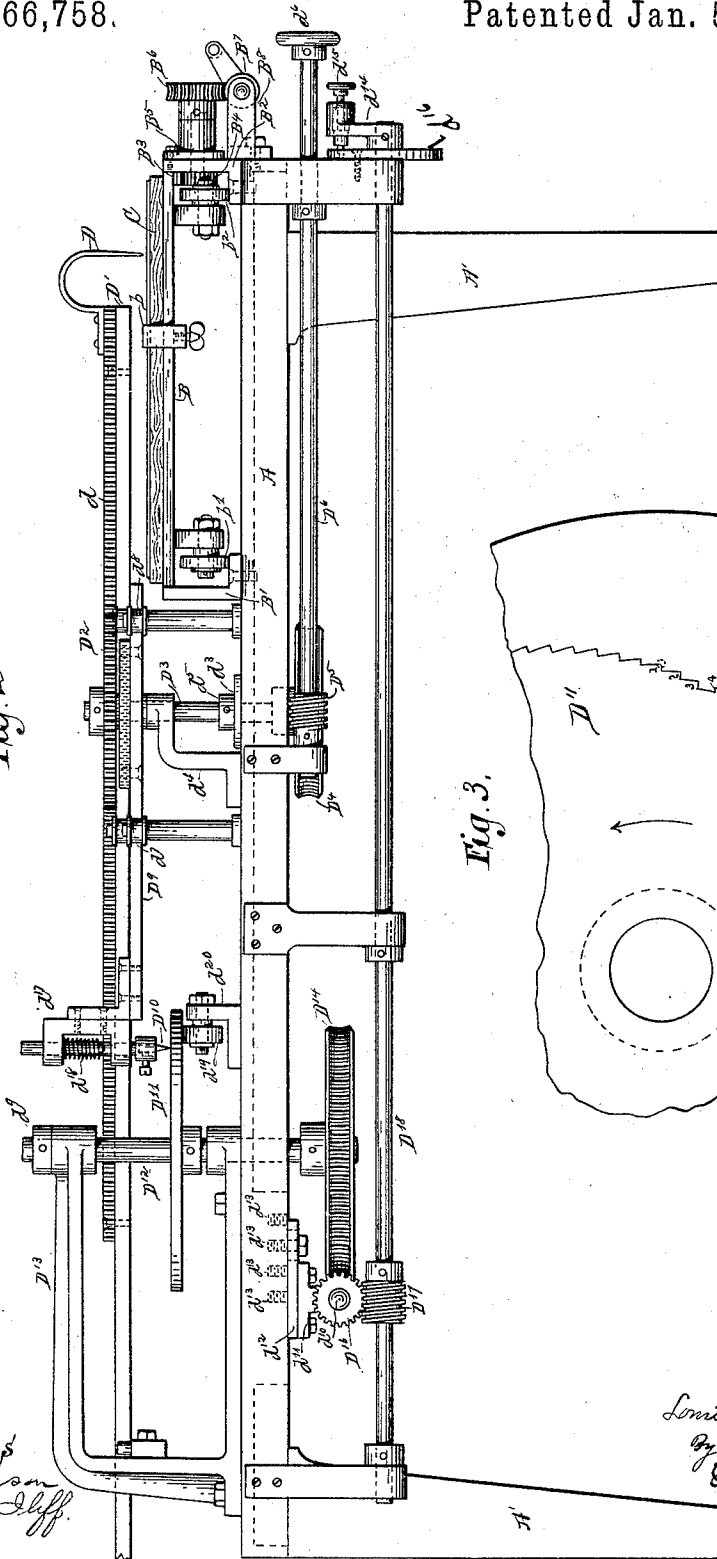
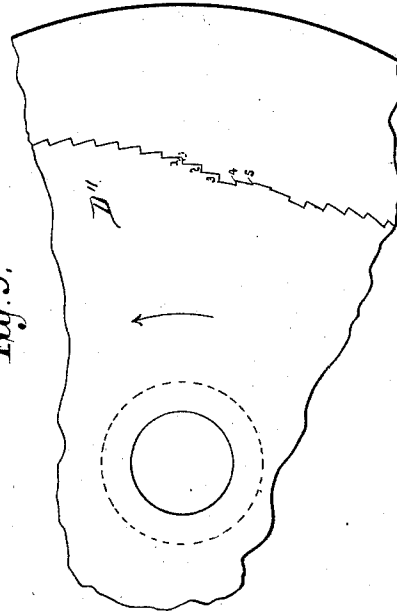


Fig. 3.



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UNITED STATES PATENT OFFICE.

LOUIS SCHULTZ, OF NEW YORK, N. Y.

MACHINE FOR LAYING OUT CAMS.

SPECIFICATION forming part of Letters Patent No. 466,758, dated January 5, 1892.

Application filed April 9, 1891. Serial No. 388,229. (No model.)

To all whom it may concern:

Be it known that I, LOUIS SCHULTZ, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Machines for Laying Out Metal Cams, of which the following is a specification.

The object of my improvement is to facilitate the laying out of cams, and is particularly applicable to laying out the pattern-cams for quilting-machines.

I will describe a machine embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a top view of a machine embodying my improvement. Fig. 2 is a side view of the same. Fig. 3 is a view on an enlarged scale of a portion of a plate which is marked to form a pattern-cam for a quilting-machine.

Similar letters of reference designate corresponding parts in all the figures.

A designates a bed erected upon legs A'.

B designates a table arranged over one end of the bed and combined therewith, so as to be capable of traveling transversely across the bed. As here shown, it works between rails B' B², which are erected upon the bed A, and is provided with rollers b' b², which work along the lower portion of said rails. These rails may extend any distance along the bed A, as indicated in Fig. 1. The movable table B is designed to support a drawing of a pattern for which a cam is to be laid out. Preferably this drawing will be mounted upon a drawing-board C, and the latter will be fastened in position upon the table by clamps b or other suitable devices. The clamps which I have shown consist of pieces of metal having their ends bent transversely to their main portions at such a distance from each other that the ends may overlap the board and table. A screw engaging with tapped holes in one end of each of the clamps and impinging against the under side of the table serves to make such clamp firmly secure the board and drawing to the table. The under side of the table B is provided with a rack-bar B³, with which engages a pinion B⁴, that is mounted upon a stud journaled in a

bracket B⁵, fastened to the upright portion of the rail B². Obviously the rotation of said shaft will cause the table B to move along the rails B' B². On the shaft which carries the pinion B⁴ is affixed a worm-wheel B⁶, that engages with a worm B⁷, journaled in brackets B³, extending from the bed A. A crank on one of the journals of the worm B⁷ affords facility for rotating the latter.

While the table B could be moved by the direct application of force to it by the hand of an attendant, yet I prefer to use some such mechanism as I have described, because in this way I am enabled to secure a nicer adjustment of the movements imparted to the table.

The drawing which is mounted upon the table C will preferably be made on a scale very much larger than the pattern of which it is a copy, and its several lines are divided into steps or portions representing stitches, as may be understood from Fig. 1.

D designates a tracer which is intended to occupy a position over each step or division of the lines which in the drawing represent the pattern. It is fastened to a bar D', that is supported over the bed A in such manner as to be capable of reciprocating lengthwise thereof. As here shown, it moves between guide-rollers d' d², which are supported upon the bed A. The rollers are flat at the top and bottom, so as to maintain the bar D' in its proper horizontal position, and the rollers d² are supported upon a bracket, whereby the bar D is sustained. The bar D' is provided with a rack d, which, as here shown, is made in a separate piece and fastened by screws. Its teeth engage with the teeth of a gear-wheel D², affixed to a shaft D³, journaled in a bearing d³ and in a bracket d⁴, fastened to the bed A. The bearing d³ is simply a plate in which said shaft fits. A collar d⁵, fastened to the shaft, rests on the top of the plate and prevents the shaft from descending. The shaft D³ extends through a hole in the table, and at the lower end has affixed to it a worm-wheel D⁴, that engages with a worm-wheel D⁵, mounted on a shaft D⁶. The shaft D⁶ is journaled in brackets supported by the bed A, and is shown as provided with a hand-

wheel d^6 to facilitate moving it. Obviously by turning the shaft D^6 through its hand-wheel a rotary movement of the shaft D^3 may be produced, and thus longitudinal movements of the bar D' can be produced. It will be readily understood that by moving the table B transversely to the length of the bed A and the bar D' carrying the tracer D lengthwise of said table, it will be possible to cause the tracer to come opposite to every step or division of the lines of the drawing on the table.

On the shaft D^3 is secured a gear wheel or pinion D^7 , engaging with a rack D^8 . This rack is shown as made in a separate piece and fastened to a supporting-bar D^9 , which is capable of moving lengthwise over the bed A. As here shown, the bar D^9 is supported by feed-rollers d^7 d^8 . The bar D^9 carries a scribe or marker D^{10} , whose shank, as here shown, is fitted to a bracket d^{17} , that is attached to one end portion of the bar D^9 . It is capable of sliding vertically in this bracket and is impelled downwardly by means of a spring d^{18} , coiled around it between a pin extending transversely through the shank of the marker and one of the arms or lugs of the bracket. The point or marker proper is detachably fastened by means of a screw in a socket at the lower end of the shank. The marker D^{10} operates upon a cam blank or plate D^{11} , which is to be marked so that it can be properly cut to form a cam for producing the pattern illustrated by the drawing on the table B. The reason for using the second rack-bar D^9 is that, owing to the fact that the drawing is an enlarged illustration of the pattern it is necessary to reduce the movements of the marker to correspond with the relation between the size of the drawing and the size of the pattern illustrated by it. The cam blank or plate D^{11} is affixed to a shaft D^{12} , journaled in a yoke-shaped bracket D^{13} , fastened to the bed A. Preferably the cam blank or plate will be supported beneath the marker by means of a roller d^{19} , supported by a stud fastened to a bracket d^{20} , attached to the bed A. At the upper end of the shaft D^{12} a collar d^9 is fastened to it. This collar prevents the shaft from descending. The shaft D^{12} extends downwardly through a hole in the bed A, and at the lower end has affixed to it a worm-wheel D^{14} , which engages with a worm D^{15} . A shaft d^{10} , carrying the worm D^{15} , is journaled in brackets d^{11} , secured to a plate d^{12} , that is fastened to the under side of the bed A. The plate d^{12} is slotted in the direction of the length of the bed A and fastened to the latter by screws passing through said slots and engaging with tapped holes in the bed A. Owing to this, the shaft d^{10} may be adjusted toward and from the shaft D^{12} to provide for using wheels D^{14} of different sizes. This adjustment of the plate d^{12} is not restricted by the length of its slots, for, as indicated at d^{13} in Fig. 2, the bed A may be provided with a

number of tapped holes for receiving the screws which fasten the said plate to it.

The shaft d^{10} has affixed to it a worm-wheel D^{16} , that engages with a worm D^{17} , mounted upon a shaft D^{18} , which is supported by brackets depending from the bed A. The shaft D^{18} has affixed to it a crank d^{14} , which is provided with an adjustable pin d^{15} , impelled by a spring to move into engagement with a plate d^{16} , that is fastened to one of the brackets whereby the shaft D^{18} is supported. It is intended that each time the shaft D^{18} is moved it shall be moved one complete rotation. This will adjust the cam blank or plate rotarily a distance proper for forming the periphery of one step of a pattern-cam, such as is indicated in Fig. 3.

The radial lines for the ends of the steps of the pattern-cam are produced by rotating the shaft D^6 , and thereby moving the rack-bars D' and D^9 .

The movements of the table B do not produce any movements of any other parts of the machine, but are made solely for the purpose of bringing different portions of the pattern illustrated in the drawing beneath the tracer D.

On the drawing shown in Fig. 1 I have numbered certain steps or divisions of the pattern represented by the drawing 1 2 3 4 5, and in Fig. 3 I have similarly numbered corresponding portions of the pattern-cam, which is marked upon the cam blank or plate D^{11} .

In operating the machine the table B and the rack-bar D' will be moved so as to bring the tracer D over one of the steps or divisions of the drawing on the table. These movements may be made simultaneously. The movement of the bar D' will cause a corresponding, although shorter, movement of the bar D^9 , carrying the marker. Next the pattern cam or plate will be moved rotarily a distance resulting from the making of a complete rotation of the shaft D^{18} . After this the table B and bar D' will be adjusted to bring the tracer D over the next step or division of the pattern represented by the drawing, and, this having been done, the cam blank or plate will again be moved by rotating the shaft D^{18} . This operation will be continued until the pattern-cam shall have been completely laid out.

The cutting of the pattern-cam may be done in any desired manner.

If it is desired to produce cams for causing movements of a fabric in two directions at right angles to each other, as is usually the case in quilting-machines, the cam for producing movement in one of these directions may be made by using my machine exactly in the manner described, and the cam for producing movement in the other direction can afterward be laid out by shifting the drawing upon the table B, so that it will occupy a position at right angles to the position in which

it is illustrated in Fig. 1. After adjusting the drawing the machine will be used precisely as in the manner described.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for laying out cams, the combination of a reciprocating table for supporting a drawing, a tracer reciprocating transversely to the reciprocation of the table, a rotary support for a cam-blank, and a marker reciprocating to correspond with the reciprocations of the tracer, substantially as specified.

2. In a machine for laying out cams, the combination of a reciprocating table for supporting a drawing, a tracer reciprocating transversely to the reciprocation of the table, a rotary support for a cam-blank, a marker independent of the tracer, and gearing substantially such as described for connecting the tracer with the marker, substantially as specified.

3. In a machine for laying out cams, the combination of a reciprocating table for supporting a drawing, a tracer mounted upon a bar and reciprocating transversely to the reciprocation of the table, a rotary support for a cam-blank, a marker, a reciprocating bar carrying said marker, and gearing substantially such as described for connecting the bar carrying the tracer with the bar carrying the marker, substantially as specified.

4. In a machine for laying out cams, the combination of a reciprocating table, a rack affixed thereto, a gear-wheel engaging with the rack, a worm-wheel moving with said gear-

wheel, a worm for imparting motion to said worm-wheel, and a tracer reciprocating transversely to the reciprocation of the table, substantially as specified.

5. In a machine for laying out cams, the combination of a reciprocating table for supporting a drawing, a tracer reciprocating transversely to the reciprocation of the table, a rotary support for a cam-blank, a marker reciprocating to correspond with the reciprocations of the tracer, a worm-wheel attached to said rotary support, and a worm engaging with said worm-wheel, substantially as specified.

6. In a machine for laying out cams, the combination of a reciprocating table for supporting a drawing, a tracer reciprocating transversely to the reciprocation of the table, a rotary support for a cam-blank, a marker reciprocating to correspond with the reciprocations of the tracer, a worm-wheel attached to said rotary support, a worm engaging with said worm-wheel, a second worm-wheel, a worm engaging with the second worm-wheel, a shaft carrying the last-mentioned worm, a crank on this shaft, and a detent for holding the shaft in position, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS SCHULTZ.

Witnesses:

EDWIN H. BROWN,
MONTAGUE D. COHEN.