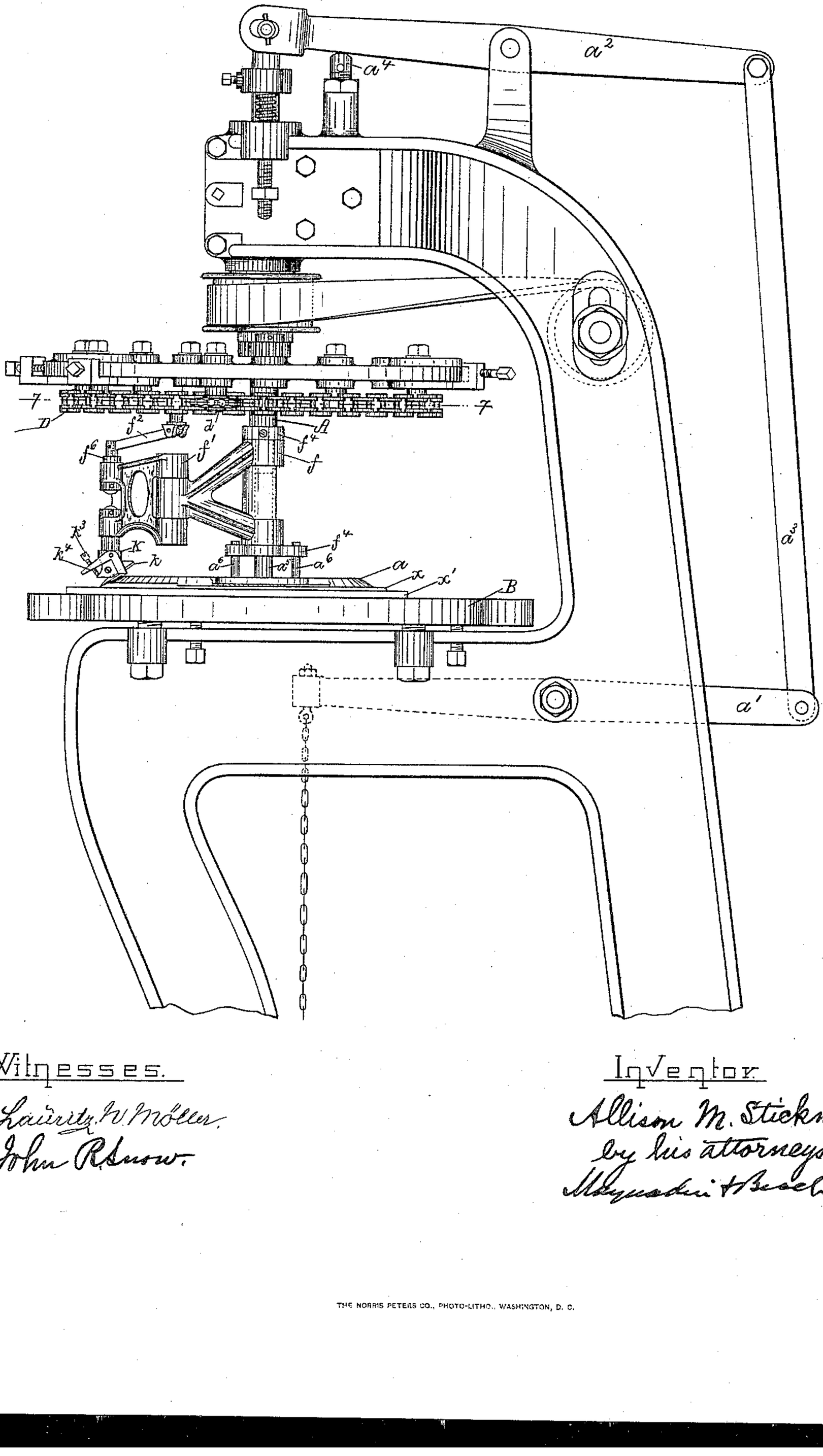
(No Model.) 5 Sheets—Sheet 1.

A. M. STICKNEY.

MACHINE FOR CUTTING SOLES, &c.

No. 446,555. Patented Feb. 17, 1891.

Fig. 1.



Witnesses.

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(No Model.)

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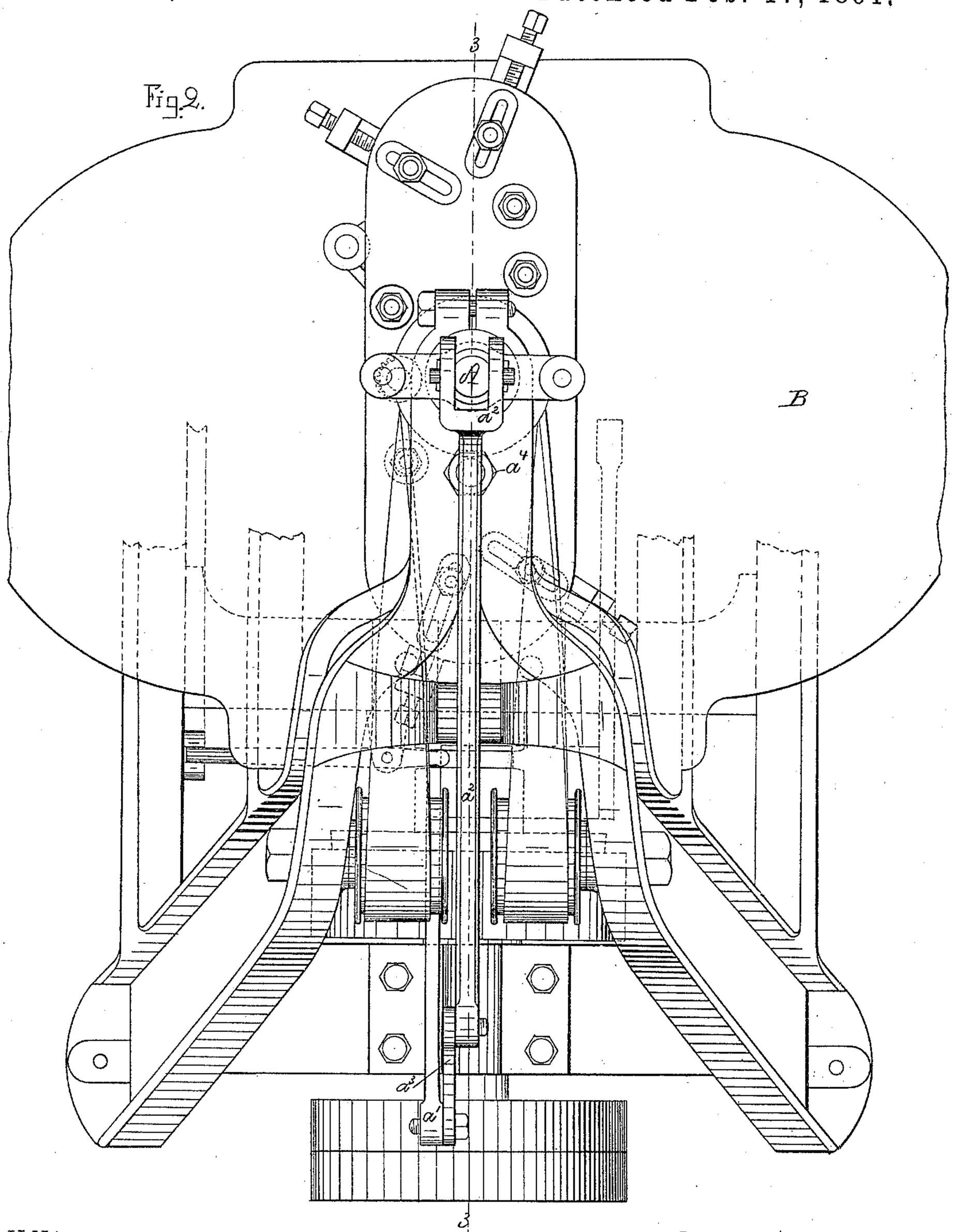
A. M. STICKNEY.

MACHINE FOR CUTTING SOLES, &c.

No. 446,555. Patented Feb. 17, 1891.

Fig. 2.



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(No Model.) 5 Sheets—Sheet 3.

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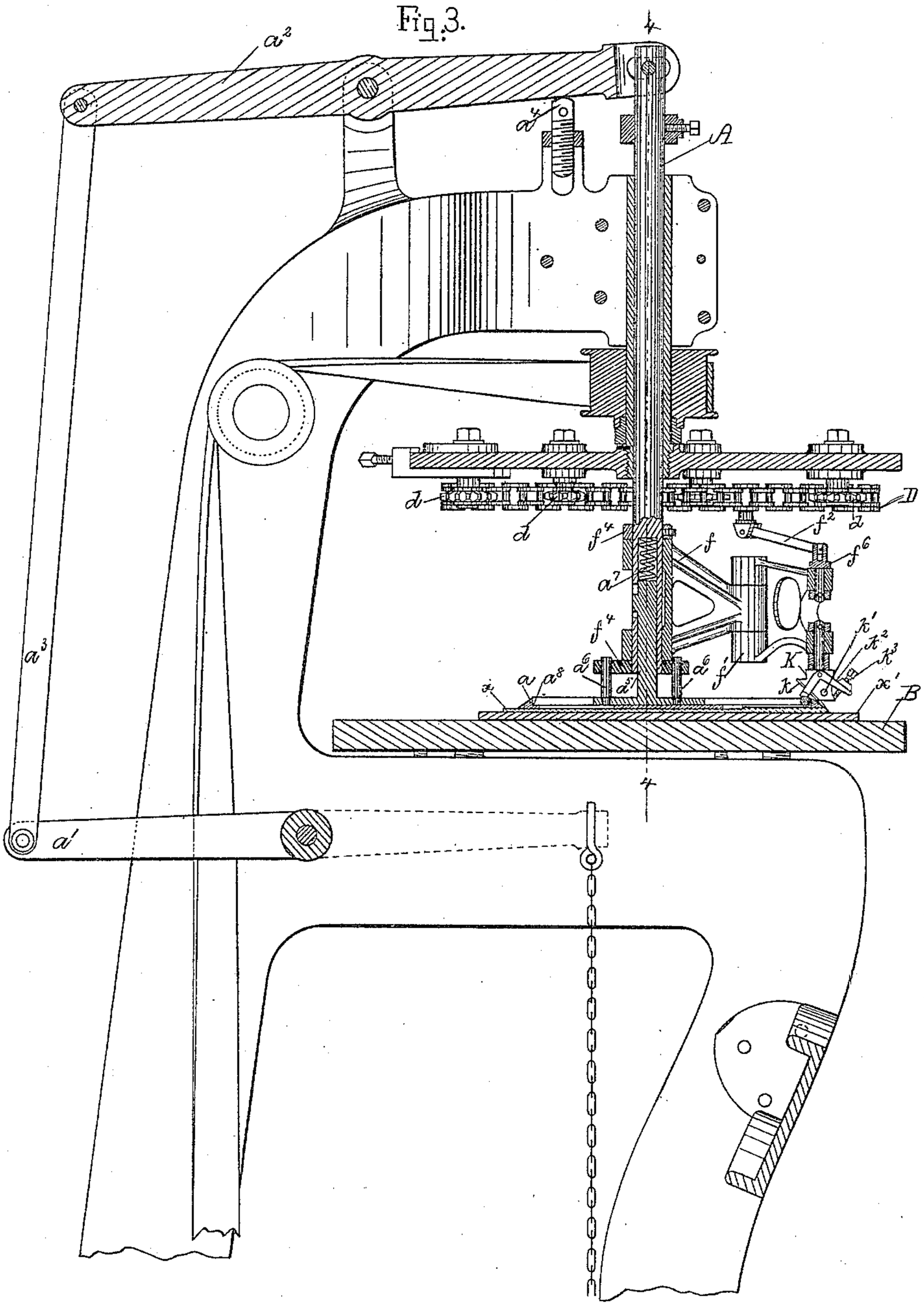
MACHINE FOR CUTTING SOLES, &c.

No. 446,555. Patented Feb. 17, 1891.

Fig. 3.



Witnesses.

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(No Model.) 5 Sheets—Sheet 4.

A. M. STICKNEY.

MACHINE FOR CUTTING SOLES, &c.

No. 446,555. Patented Feb. 17, 1891.

Fig. 4.

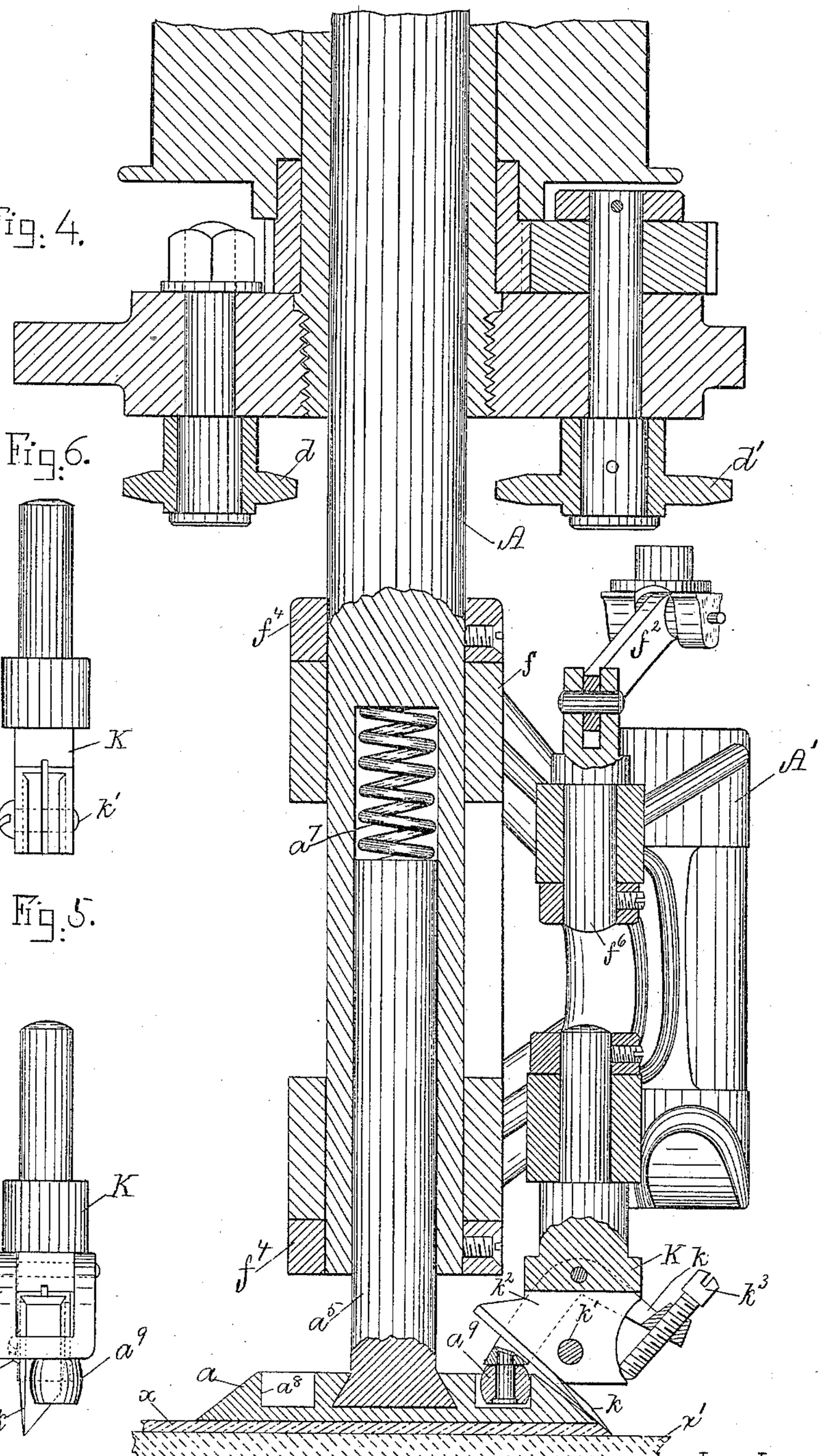

Fig. 6.

Fig. 5.

Witnesses. B

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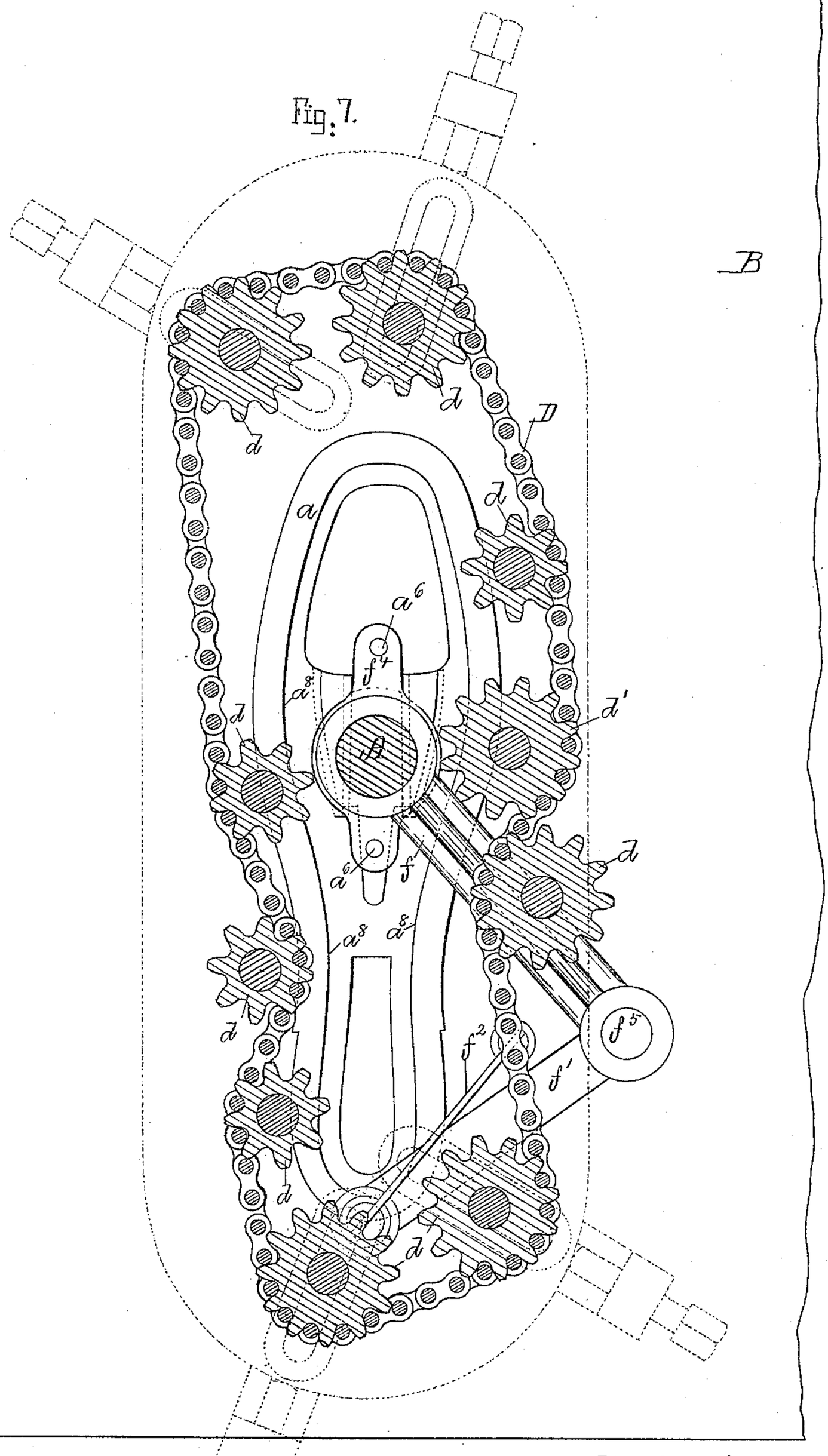
(No Model.) 5 Sheets—Sheet 5.

A. M. STICKNEY.

MACHINE FOR CUTTING SOLES, &c.

No. 446,555. Patented Feb. 17, 1891.

Fig. 7.



Witnesses.
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John R. Snow.

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UNITED STATES PATENT OFFICE.

ALLISON M. STICKNEY, OF MEDFORD, ASSIGNOR TO THE WELLMAN SOLE CUTTING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

MACHINE FOR CUTTING SOLES, &c.

SPECIFICATION forming part of Letters Patent No. 446,555, dated February 17, 1891.

Application filed November 6, 1890. Serial No. 370,566. (No model.)

To all whom it may concern:

Be it known that I, ALLISON MORRIS STICKNEY, of Medford, in the county of Middlesex and State of Massachusetts, have invented an Improved Machine for Cutting Soles and other Forms, of which the following is a specification, reference being had to the accompanying drawings, making a part hereof, in which—

Figure 1 is a side elevation of the upper portion of a machine embodying all the features of my invention. Fig. 2 is a plan. Fig. 3 is a section on line 3 3 of Fig. 2. Fig. 4 is a sectional view, on a larger scale, for clearness on line 4 4 of Fig. 3, the knife-block being in the plane of the section and the sprocket-chain not shown. Figs. 5 and 6 are elevations of the knife-block detached. Fig. 7 is a section, on a larger scale, on line 7 7 of Fig. 1.

My invention relates to the cutting of soles or the like; and it consists, mainly, in a new contrivance for connecting the knife with the chain or the like, by which the knife is moved about the pattern.

In the drawings, A represents a stud in the overhanging part of the frame, and B a table on which the leather or other material is placed. The stud A carries the pattern-plate a, and the material x is clamped between the table B and pattern a. In cutting rubber and some other materials a cutting-plate x' is usually interposed between the table B and material x. While either may move toward the other, I prefer to move the stud A toward table B by means of treadle-lever a', lever a^2, and connecting-rod a^3, and to use an adjusting-stop a^4, which is so set that when the material is clamped the point of the cutting-edge of the knife will be in the proper relation with the surface of the table or cutting-plate x'.

A chain D or its equivalent, arranged on sprocket-wheels d d', one of which is driven by power, as indicated in Fig. 4, is one well-known means for giving a knife-holder a motion in a closed or endless path, and I have shown that driver in the drawings, although, as will be clear, any analogous device may be used, for my invention does not relate, primarily, to that device, (although one feature of my invention is an improved device of that kind, as fully explained below,) but consists in the combination of the knife-holder with a device for giving it a motion in a closed path by means of three arms, one of which f is journaled on the main stud A, the second f', journaled to f and carries the knife-block, while the third f^2 connects arm f' with the chain D or its equivalent. By this device—the three arms $ff'f^2$—the knife-block is not only compelled to travel about the form or pattern plate a, but is also (by the aid of a spring or guide-roll or the like, or by the bevel of the knife and stiffness of the stock) held in close contact with the guiding-edge of the pattern-plate, and the contour of the pattern-plate a may differ far more widely from the closed path in which any point of chain D travels than is practical in any other machine of this class known to me.

In Fig. 4 the main stud A and the arms f f' are shown full size. The arm f is a frame connected to stud A by hubs, which are kept in place by the collars f^4. The arms f f' are connected by the pin f^5, and the pin f^6 connects f^2 and f'. The knife k is clamped by set-screw k', and the knife-block K has a tang in line with pin f^6. The knife-block swivels on its tang. The other end of arm f^2 is connected to chain D, as shown in Figs. 1, 3, and 7, although, as will be clear, it may be attached in any convenient way to the mechanism for giving it a motion in a closed path.

The form a, instead of being connected rigidly to stud A, is mounted upon an auxiliary stud a^5, which is socketed in stud A, but prevented from turning in its socket by pins a^6, passing through the lower collar f^4, fast to stud a. It is backed up by spring a^7, in order that it may yield slightly to suit different thicknesses of stock, for, as before intimated, the distance between the lower end of stud A and the surface of table B is regulated by stop a^4, and stop a^4 is so adjusted as to bring the point of knife k into contact with table B. It results that as form a and table B are brought together to clamp the stock between them form a is slightly moved back against the stress of spring a^7, while the point of the knife k penetrates the stock. This is one of

the features of my invention of much practical value, for heretofore in all machines of this class known to me the knife projected always the same distance beyond the clamping-surface of the form, while in my machine the form yields as it clamps the stock, and one advantage of this is that the knife projects more or less, according to the thickness of the stock.

Another feature of my invention is an improved device for driving the knife-holder, and this improvement consists in an inward curve of the chain at both sides of the shank, as clearly shown in Fig. 7. This part of my invention is the combination, with the chain D, of two pairs of wheels d d and d d', one of each pair being within the chain and the other of each pair without the chain, thereby giving the chain the inward curves at the shank, as plainly shown in Fig. 7. I also have found that in lieu of the single wheel heretofore used at the toe and at the heel a pair of wheels d', arranged as shown in Fig. 7, are desirable. The extra wheel between the toe-wheels and shank-wheels and the second extra wheel between the heel-wheels and shank-wheels (shown in Fig. 7) are also desirable, as they give smoothness to the motion of the knife-holder and allow widely-different sizes and styles of patterns to be used with the same chain. Heretofore in devices of this class the chain required adjustment in length for the extreme sizes; but with my improved device the only adjustment is to shorten the arm f^2 slightly for the largest sizes of soles. This is mainly due to the inward curves of the chain at the shank.

In cutting certain kinds of material, and when the chain is driven in a direction to cause a pull on (and not a thrust) an arm f^2, the bevel of the knife tends to cause its edge to hug the pattern; but this in itself is not sufficient in most cases, and for that reason a spring should be used tending to shut arms f and f' together; but this spring is objectionable if constantly acting, the reason that it becomes too tense at the heel and toe if made tense enough at the shank, and although this defect could be readily remedied, yet it is simpler and better to use a guide-ledge a^8 on the pattern and a guide-roller a^9 on the knife-block, as clearly shown in Figs. 3, 4, and 7. This also constitutes one feature of my invention, and is of considerable value in giving an easy travel of the knife-block about the pattern, while insuring proper contact between the knife and the perimeter of the pattern. Moreover, it enables me to move the chain in a direction to give a thrust (and not a pull) on arm f^2, which is practically essential in cutting soles from sheet-rubber or other soft material.

As the patterns vary somewhat so far as concerns the distance between the force of ledge a^8 and the cutting-edge of the knife, I make the guide a^9 adjustable by mounting it upon a stud, which is fast to the swing-frame k^2, pivoted to the knife-block K, and adjustable by the set-screw k^3, as clearly shown in Figs. 1, 3, 4, and 5.

The operation of my machine is as follows: The stock is placed upon the table B, and the form a then forced down upon it and held there with the knife k, passing through the stock and close to the edge of the pattern-plate a. The machine is then set in motion, (by a clutch motion or in any other convenient way,) and the knife-holder arms f, f', and f^2 thereby caused to travel in a closed path by the motion of chain D. This causes knife k to travel about form a, following all the sinuosities of form a, for the guide-roller a^9, acting with the guide-ridge a^8, causes the knife to remain close to the edge of pattern a.

What I claim as my invention is—

1. In a machine for cutting soles and the like, a knife-block, in combination with three arms f f' f^2 and a driving-chain, the outer arm being connected with the driving-chain and the inner arm revolving about a fixed axis, all substantially as described.

2. In combination, a knife-block, a pattern provided with a guide-ledge a^8, a guide-roll carried by the knife-block, arms f f' f^2, and a driving-chain, all substantially as described.

3. In a machine for cutting soles and the like, a knife and a lengthwise-driven chain, in combination with two pairs of wheels near the shank, one of each pair being within and one of each pair without the driven chain and giving the shank curves, substantially as described.

4. In a machine for cutting soles and the like, form a, auxiliary stud a^5, and spring a^7, in combination with main stud A and a knife-holder carried by main stud A to permit the clamping-surface of form a to vary as the thickness of the stock varies with relation to the knife carried by the knife-holder, substantially as and for the purpose set forth.

ALLISON M. STICKNEY.

Witnesses:
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