

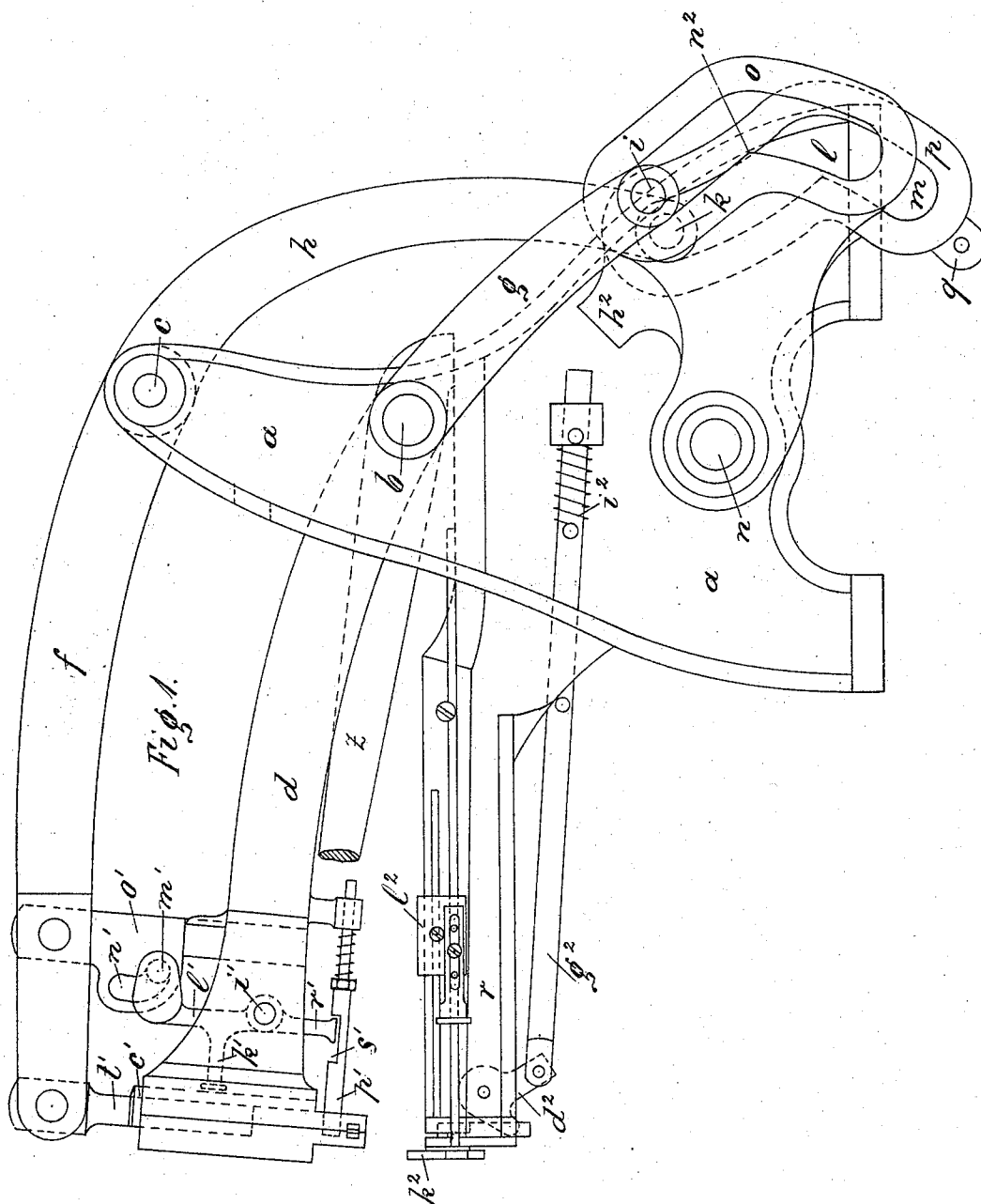
(No Model.)

3 Sheets—Sheet 1.

F. T. SPECKBÖTEL.
BOX STAPLING MACHINE.

No. 576,382.

Patented Feb. 2, 1897.



Witnesses:
Willie Miller
William Schuly.

Inventor:
Friedrich Theodor Speckhöbel
by his attorneys
Boeder & Briesend

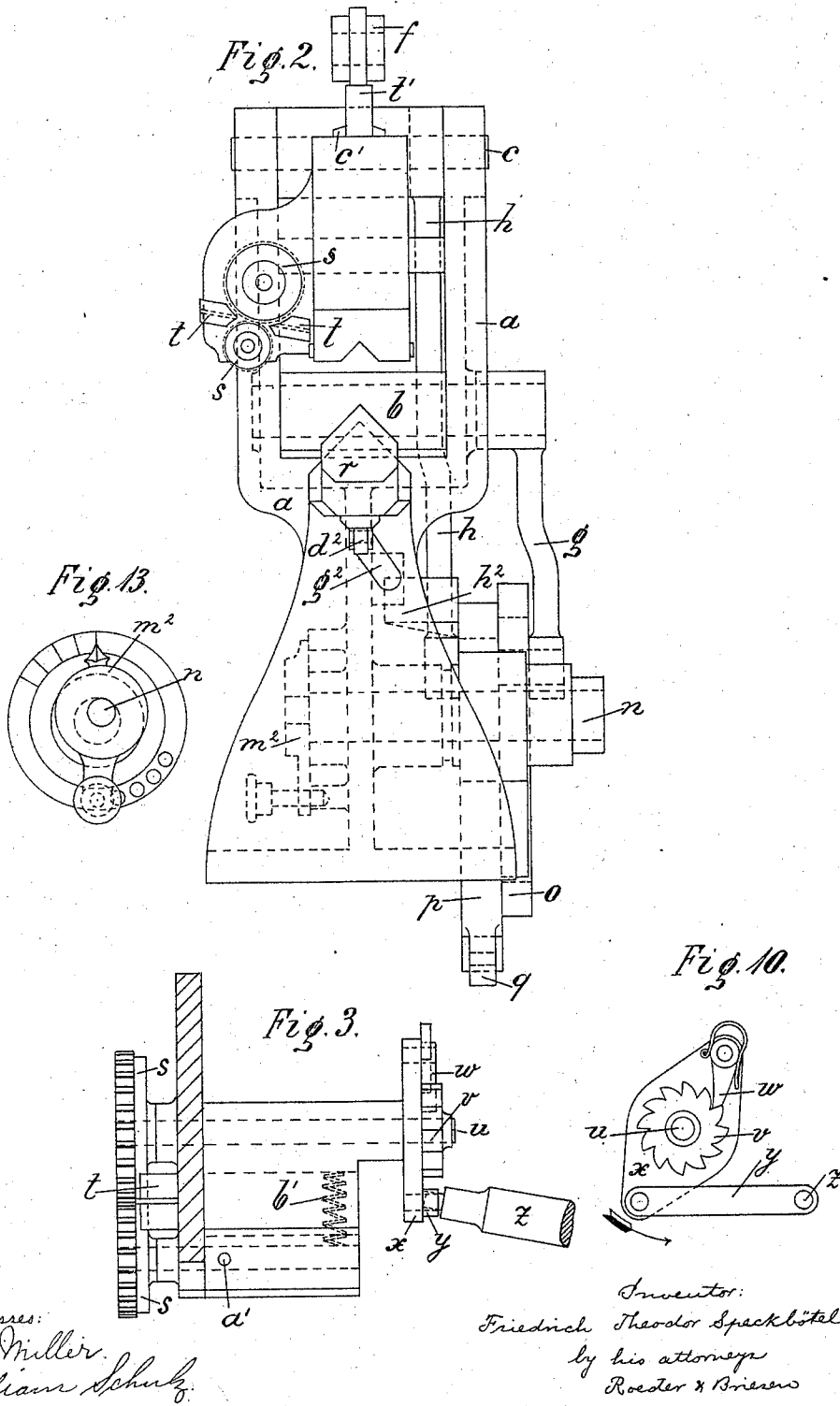
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3 Sheets—Sheet 2.

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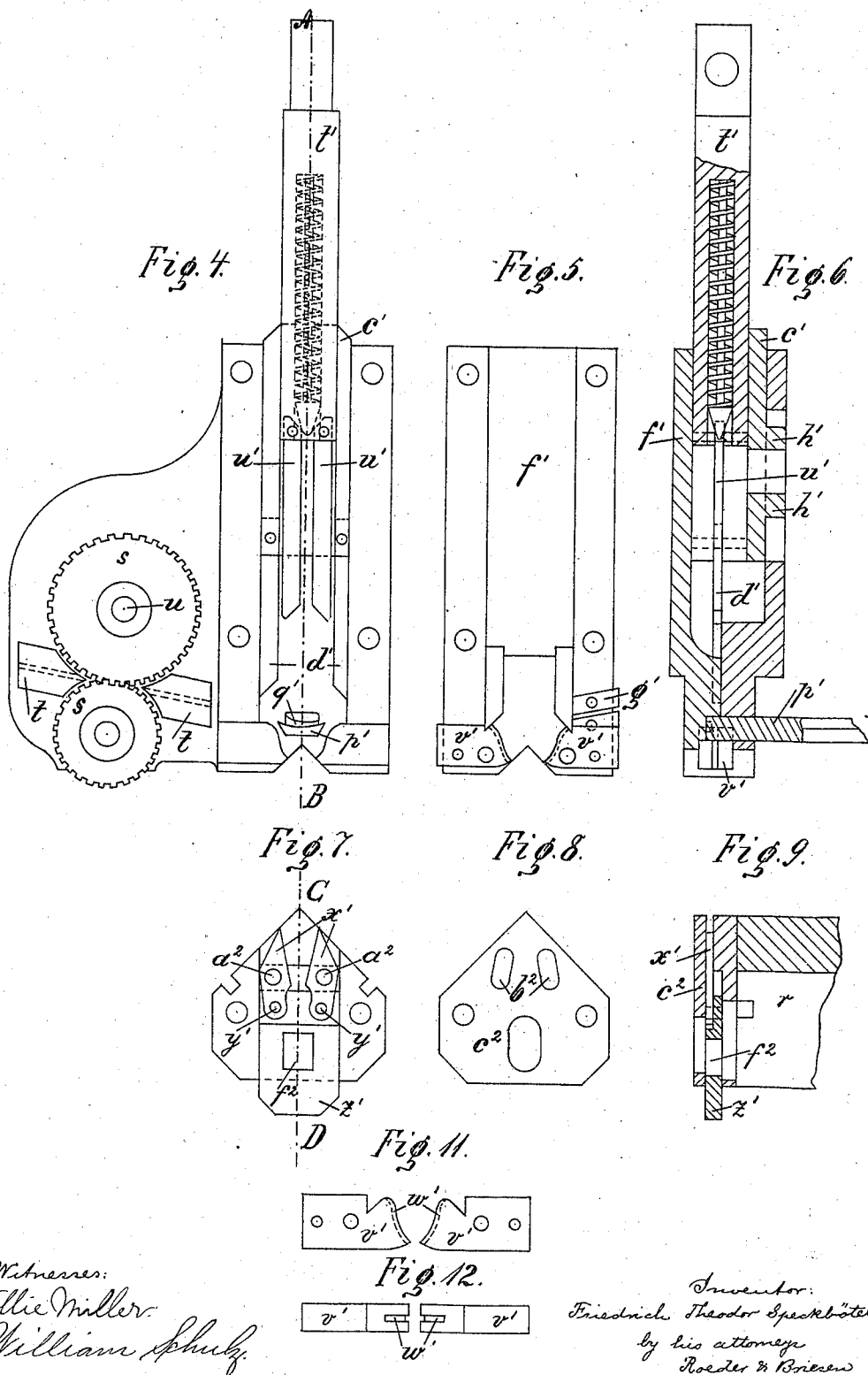
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UNITED STATES PATENT OFFICE.

FRIEDRICH THEODOR SPECKBÖTEL, OF HAMBURG, GERMANY.

BOX-STAPLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,382, dated February 2, 1897.

Application filed February 19, 1896. Serial No. 579,883. (No model.)

To all whom it may concern:

Be it known that I, FRIEDRICH THEODOR SPECKBÖTEL, a subject of the King of Prussia, Emperor of Germany, and a resident of Hamburg, Germany, have invented an Improved Box-Stitching Machine, of which the following is a specification.

This invention relates to a machine for making wooden boxes of which the single sides are joined by means of wire staples. As the most essential parts of the machine are to be mentioned, the apparatus for bending the wire staples and for driving them through the wood to be joined, and the apparatus for clenching the projecting wire ends. All these apparatus are so alternately connected with each other that they always come to action in the proper succession when the machine is set to work by means of a foot-treadle.

The machine is illustrated in the accompanying drawings, in which—

Figure 1 shows the machine in side elevation, the wire-feeding apparatus having been left away; Fig. 2, the same in front elevation; Fig. 3, the wire-feeding apparatus in side elevation; Fig. 4, a front view of the so-called "wire-head," the covering-plate having been removed; Fig. 5, a view of the covering-plate turned over at an angle of one hundred and eighty degrees; Fig. 6, a sectional view of the wire-head with covering-plate on line A B of Fig. 4; Fig. 7, the apparatus for clenching the projecting wire ends in front elevation, the covering-plate having been removed; Fig. 8, a detail of this covering-plate; Fig. 9, a sectional view on the line C D of Fig. 7; Fig. 10, the mechanism for driving the wire-feeding rollers; Figs. 11 and 12, the plates guiding the wire while it is being bent and driven through in elevation and plan, and Fig. 13 the apparatus for adjusting the machine for different thicknesses of wood.

In the frame *a* of the machine two axes of rotation *b* and *c* are arranged, to which the levers *d* and *f* are keyed. Of these the former, *d*, serves as a support for the feeding, the cutting off, the staple-bending apparatus, and the apparatus for driving through the staples, while to the latter, *f*, being movable with regard to the former, *d*, the parts for moving the different apparatus are connected. The

levers *d* and *f* are moved by means of the connecting-rods *g* and *h*, these catching with their pins *i* and *k*, which for sake of decreasing the friction may be provided with rollers, into the slots *l* and *m* of the disks *o* and *p*, connected with each other and arranged turning around the axle *n*. Of the disks one is provided with an eye *q*, so connecting it with the foot-treadle, serving to work the whole machine. Below the levers the saddle *r* projects bayonet-like, within which the apparatus for clenching the projecting wire ends is arranged. This saddle has the form of a roof and serves as a support for the work.

Of the different apparati serving for the different operations the feeding apparatus shall first be more particularly described according to the succession of the operations. This apparatus consists of two feed-rollers *s*, set in a case laterally arranged at the head of the lever *d* and geared together by means of toothed wheels, and of the guide-plates *t*, arranged before and behind the rollers and provided with grooves for the wire. On the axle *u* of the one roller a ratchet-wheel *v* is fastened, into which the click *w* of a lever *x*, turning around the axle *u*, catches. The lever *x* is so connected by means of the connecting-rod *y* with lever *z*, fastened to axle *b*, that when the axle *b* is turned around a certain angle the ratchet-wheel *v* is turned on one tooth. The axle of the driven roller *s* turns around a horizontal pivot *a'* and is pressed by a spring *b'* against the driving-roller, so enabling the wire to be entered between the rollers at the beginning of the operation. As already mentioned, the feeding apparatus is fastened by means of an angular plate to the front end of the lever *d*. This front end or wire-head is case-shaped and contains a U-shaped slide-block *c'*, provided with two cutters *d'* at its lower end, of which the left one, Fig. 4, is sharp and serves as cut-off for the wire, together with the cutting-block *g'*, being the continuation of the guide-plates *t* and fastened to the cover *f'*. The slide-block bears on its back two tappets *h'*, between which the three-armed lever *i'*, turning on a pivot in lever *d*, rests with its arm *k'*, while the second arm *l'* catches by means of a pivot *m'* into the slot *n'* of the pressure-rod *o'*, connected to the lever *f*. Below the

lever d a horizontal rod p' (the so-called "bending-block") is arranged, guided partly by a block fastened to the lever d , partly by the wire-head itself, and is always pressed forward by a spiral spring. This rod is provided at its front end with a groove g' , forming the continuation of the groove in the cutting-block g' and preventing the wire from deviating while being introduced into the wire-head, the rod itself serving, together with the cutters d' , to bend the staples. The third arm r' of the above-mentioned lever i' , catching into a notch s' of the rod p' , serves to move this rod backward. Within the U-shaped sliding block c' there is arranged the sliding stamper t' , connected with the lever f . In the lower end of this stamper t' two narrow plates u' are fastened, turning around a pivot and serving to drive the staples through the box-wood. In order to prevent the wire from laterally bending or deviating, two guide-plates v' are arranged in the lower part of the wire-head provided with a corresponding groove w' , the wire being so kept from deviating laterally.

The apparatus for bending the staples and driving them through the wood having thus been described, there remains only the mechanism arranged within the saddle r for clenching the wire ends projecting through the wood. This mechanism is formed by two tongues x' , turning around the pivots y' of a plate z' , arranged vertically movable within the saddle and catching with pins a^2 in the slots b^2 of the saddle cover-plate c^2 . The tongues are moved by means of an angle-lever d^2 , arranged turning within the saddle and catching with an arm into the slot f^2 of the plate z' , while the second is connected with a rod g^2 , the back end of which lies in the course of a head h^2 on the disk p , the rod itself being always drawn back by a spiral spring i^2 . For sake of equally distributing the single staples along the different lengths the saddle r is provided with adjustable ledges k^2 and l^2 .

Lastly, an apparatus is provided for adjusting the machine for different thickness of wood, as else the bending of the staples could not be correct. This consists of a hand m^2 , eccentrically arranged on the axle n . By turning this axle in the direction of the arrow the levers d and f are more or less advanced toward the saddle.

The action of the machine is as follows: The end of the wire rolled on a reel next to the machine is entered, after having pressed down the lower feeding-roller against the action of the spring b' , through the feed-channel so far between the rollers until it stops on the right side, Fig. 4. Then lay the woods on the saddle as they shall be joined together and move the disks o and p upward around the axle n by means of the foot-treadle. (Not shown in the drawings.) The pins i and k so slide in the slots l and m , moving the connecting-rods g and h and turning the axles b and c , whereby the levers d and f are lowered. As

soon as the front end of the lever d reaches the saddle, respectively the wood lying on it, the further motion of the lever d stops, as the pin i at this moment reaches the point n^2 of the slot l from where the slot is concentric to the axle n . The lever f , however, is lowered on farther, the slot n' of pressure-rod o' coming into action. This causes the three-armed lever i' to turn, so lowering the sliding block c' and at the same time the cutters d' . Consequently the left side cutter, Fig. 4, sliding along the cutting-block g' , cuts off the wire, guided by the channel in the cutting-block, whereupon the inward cutter-surface, together with the rod p' , bends the wire ends and so makes the staple. During this operation the stamper t' , with the staple-drivers u' , has been pressed down by further lowering of the lever f , and now the staple-drivers catch the wire and drive it through the wood, as the rod p' has been drawn back by the lever i' , and the guide-plates v' , with their grooves w' , prevent a deviation. In the last moment of the upward motion of the disks, when the slot m becomes concentric to the axle n , the head h^2 reaches the rod g^2 and turns the angle-lever d^2 . Hereby the plate z' , with the clenching-tongues a^2 , is raised and the latter smoothly turn down the projecting wire ends, whereupon the stitching is completed.

While for the first stitching the wire must be entered by hand, the further feed of wire is automatic. On the levers d and f being lowered also, the lever z has been lowered and the lever x turned in the direction as shown by the arrow, whereby the click falls into the next following left tooth of the ratchet-wheel. After the first stitching having been completed the foot-treadle is released and is drawn by a spring, stretched on pressing it down, back into its original position, the different disks and levers moving back at the same time. On so moving back, the click turns the ratchet-wheel v one tooth forward, and the wire necessary for making the next staple is entered into the machine.

As the shape of the machine, as more particularly described in drawings and description, is such as is required for stitching the sides together, it may easily be understood that by a simple change of the saddle the same apparatus can be used for stitching on the bottom without changing the principle of the machine. Furthermore, the whole mechanism may be arranged double or triple in order to drive in two or three staples at a time. Though the machine hereby gets somewhat complicated the multiplying requires no principle change.

What I claim is—

1. In a box-stitching machine, the combination of a cutter with a lever f , a slotted rod o' , connected thereto, and a lever i' , engaging the slotted rod and adapted to actuate the cutter, substantially as specified.

2. In a box-stitching machine, the combi-

nation of a wire-feed with a cutter, a stamper
engaging the same, a bending-rod, and a three-
armed lever adapted to actuate both the cut-
ter and the bending-rod, substantially as
5 specified.

3. In a box-stitching machine, the combi-
nation of a pair of levers *f*, *d*, with a stamper
connected to lever *f*, a wire-feed, cutter and
bending-rod connected to lever *d*, and a three-

armed lever oscillated by lever *f*, and adapt- 10
ed to actuate both the cutter and the bend-
ing-rod, substantially as specified.

Signed at Hamburg, Germany, this 4th day
of February, A. D. 1896.

FRIEDRICH THEODOR SPECKBÖTEL

Witnesses:

MAX FOUQUET,
KARL KUSSICKE.