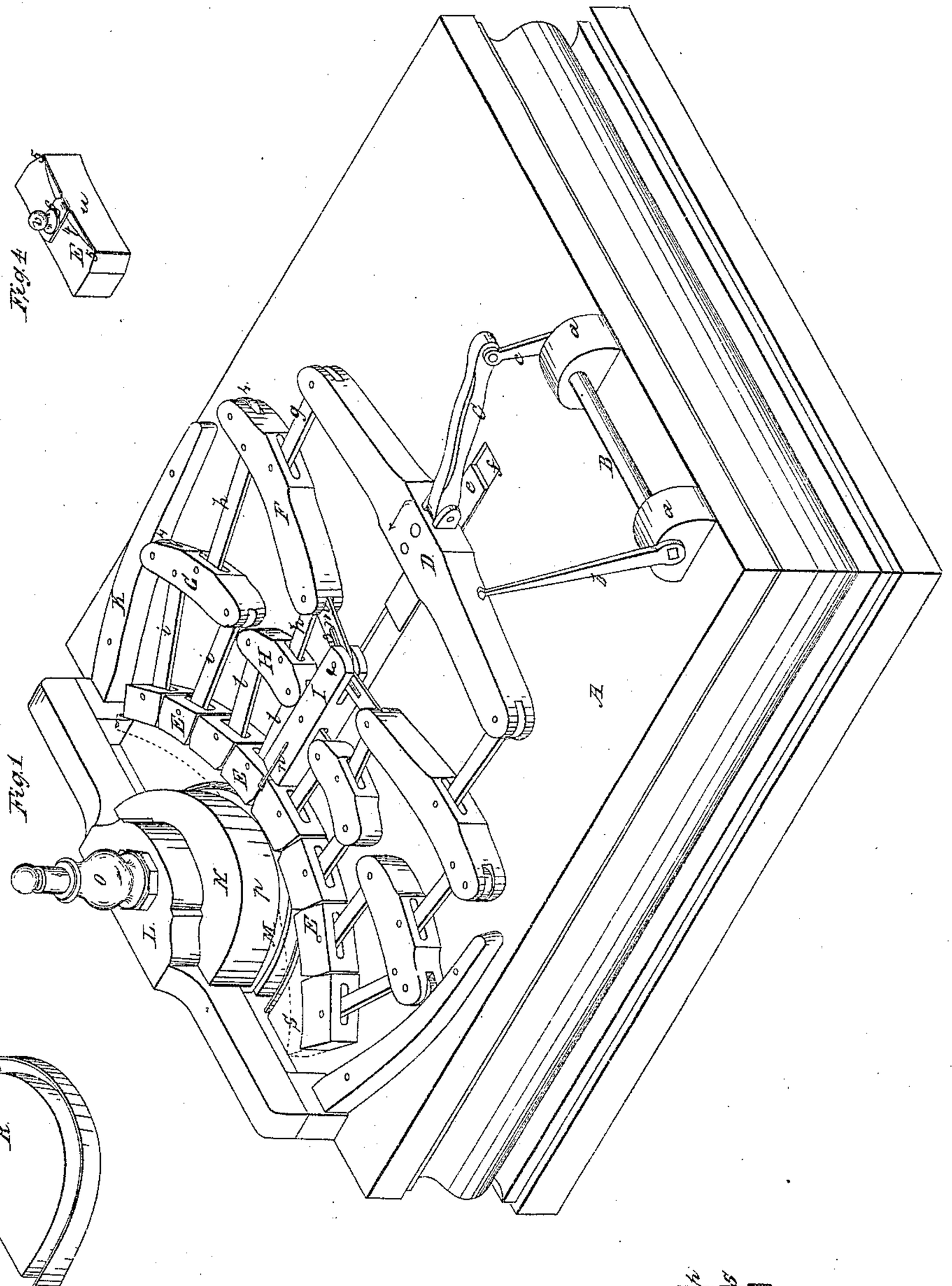
R. Fitts,

Bending Wood.

No 22,529. Patented Jan. 4, 1859.



UNITED STATES PATENT OFFICE.

ROBERT FITTS, OF NEW IPSWICH, NEW HAMPSHIRE, ASSIGNOR TO C. & G. C. WINCHESTER, OF ASHBURNHAM, MASSACHUSETTS.

METHOD OF BENDING WOOD.

Specification of Letters Patent No. 22,529, dated January 4, 1859.

To all whom it may concern:

Be it known that I, ROBT. FITTS, of New Ipswich, in the county of Hillsboro and State of New Hampshire, have invented a new and Improved Machine for Bending Wood, Such as Pieces for Chair-Backs, &c., of which the following is a full, clear, and exact description reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a view of the machine; Figs. 2, 3, and 4, details to be referred to hereafter.

A, is the bed of the machine from which rise too short standards *a*. These serve as bearings for a rock shaft B, to one end of which is attached a lever *b*, for operating the machine; the other end of the shaft carries a crank *c*. A connecting rod C is pivoted at one end to the crank *c*, and at the other to a cross head D. A flat block *e*, attached to the under side of the cross head D, slides back and forth in a groove *f*, in the bed A. To each end of the cross head D, is attached a series of levers and rods which terminate in the blocks E. (As these are similar on the two sides of the machine I will describe and letter but one set.) To the outer end of one arm of the cross head D is pivoted a flat bar *g*, the other end of which enters a slot in and is pivoted to a lever F, at a point rather nearer to the outer than to the inner end of the lever. Between the point at which the bar *g*, is pivoted and the outer end of the lever is pivoted another bar *h*, the other end of which is pivoted to the middle of a lever G, from each end of which a bar *i* leads to one of the blocks E. To the inner end of the lever F, is pivoted a bar *k*, connected with a shorter lever H, at a point between the middle of its length and the end nearest to the middle of the machine; each end of this last named lever is connected by a bar *l*, with one of the blocks E. All these flat bars are so pivoted to the levers and block in slots formed at or near the middle of the thickness of the levers and blocks, that at the same time they have a slight horizontal play, any pressure applied to the cross head D in the direction of its arrow may be communicated to the blocks E, in a plane parallel with the face of the bed A. A block I, is permanently secured to the bed A, in the middle of the width of the machine. A flat bar *m*, is pivoted to the inner end of the lever F, and plays in a slot in one end of the block I; a pin 2 passes through the block and enters a slot 3 in the bar *m*. A similarly slotted bar connects the lever H, in a similar manner with the block I. The mode above described of connecting the levers with each other and with the blocks, gives to those blocks E, which are farthest from the center the greatest range of motion.

To insure the outer blocks E, completing the latter part of their movement in a satisfactory manner when a piece of wood is to be bent to a semi-circular form as in the machine represented, I sometimes use the guide K, (one on each side.) This guide is an inclined block secured to the outer side of the bed plate against which the ends of the levers F and G, bear as they are pushed toward the form. A small friction roll 4, is placed in the end of each lever. As these rolls come in contact with the inclined side of the guide K, the levers are pressed in a little more toward the middle of the form around which the wood is being bent, and the last or outer block E, has the pressure continued on it a little farther than would always be the case without the guide K.

A flat strip of metal *n*, is inserted in the lower end of the block I, and extends out between the two central blocks E, which are cut away a little to receive it; this serves as a guide to keep the blocks E, in a proper position with respect to the center of the machine.

To a cross brace L, at one end of the bed plate A, is secured the form M, around which the piece of wood (shown in red Figs. 1 and 2,) is to be bent. Over this form fits a cap N, which is furnished with a rim or lip *p*, which surrounds the form M. To the top of the cap N, is attached a rod *o*, terminating in a handle or plunger P, which plays up and down in a socket O, on the top of the cross brace L. A spring *r*, coiled around the rod *o*, serves to raise the plunger and the cap N, after they have been depressed. Immediately beneath the form M, a recess is made in the end of the bed plate A, for the reception of a slide or receiver R, (shown detached in Fig. 3). This has formed around its outer edge a groove *s*, of the proper form and capacity to receive the piece of wood after it is bent. The inner

edge of this groove corresponds to and lies immediately under the face of the form M, when the slide R, is in place.

In order that the blocks E, may have the proper bearing on the outer surface of the wood being bent, I have applied to each one a spring face as shown in Fig. 4, (which is a view of one of the blocks detached), The face of the block is curved as at *t*, to suit the form of the bent wood after it has been brought to its semicircular form, but as the piece of wood is straight or nearly so when the bending operation commences the block E, would have no bearing on the wood except at or near its corners at 5. To obviate this I have furnished each block with a sheet steel face *u*, which is held to the block by a pin *v*, passing through a slot in a piece 6, which projects from the piece *w*. With this arrangement the steel plate *u* yields as the pressure is applied and conforms to the gradually increasing curve of the piece of wood which is being bent.

Operation: The following is the operation of this machine: The piece of wood S, to be bent (shown in red Figs. 1 and 2) is placed between the blocks E, (which are drawn back to a straight line) and the form M. The hand lever *b*, is then pressed down in the direction of its arrow which forces the cross head D, in the direction of its arrow, and through the levers F, G, and H, and their connecting bars applies the required pressure to the blocks E, to bend the wood S around the form. When the inner surface of the bent wood has been brought into contact with the form M, the cap N, is driven down by pressure or a blow applied to the plunger P, and the lip *p*, carries the bent piece S down into the groove S, in the receiver R, in which it is removed from the machine. A number of the receivers R, may be kept on hand, so that when one is removed it may be replaced by another.

The machine represented and above described is intended for bending short pieces of wood suitable for chairs, but it is evident that it is applicable to the bending of pieces of wood into other forms and of any dimensions consistent with the capacity of the machine used.

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

1. Bending a piece of wood around a fixed form by means of the series of blocks, levers and connecting bars, arranged and operating in the manner set forth.

2. And in combination with the above I claim the spring face plate *w*, attached to the blocks E, substantially in the manner and for the purpose specified.

ROBERT FITTS.

Attest:

CHAS. A. CAMPBELL,

WILLIAM P. ELLIS.