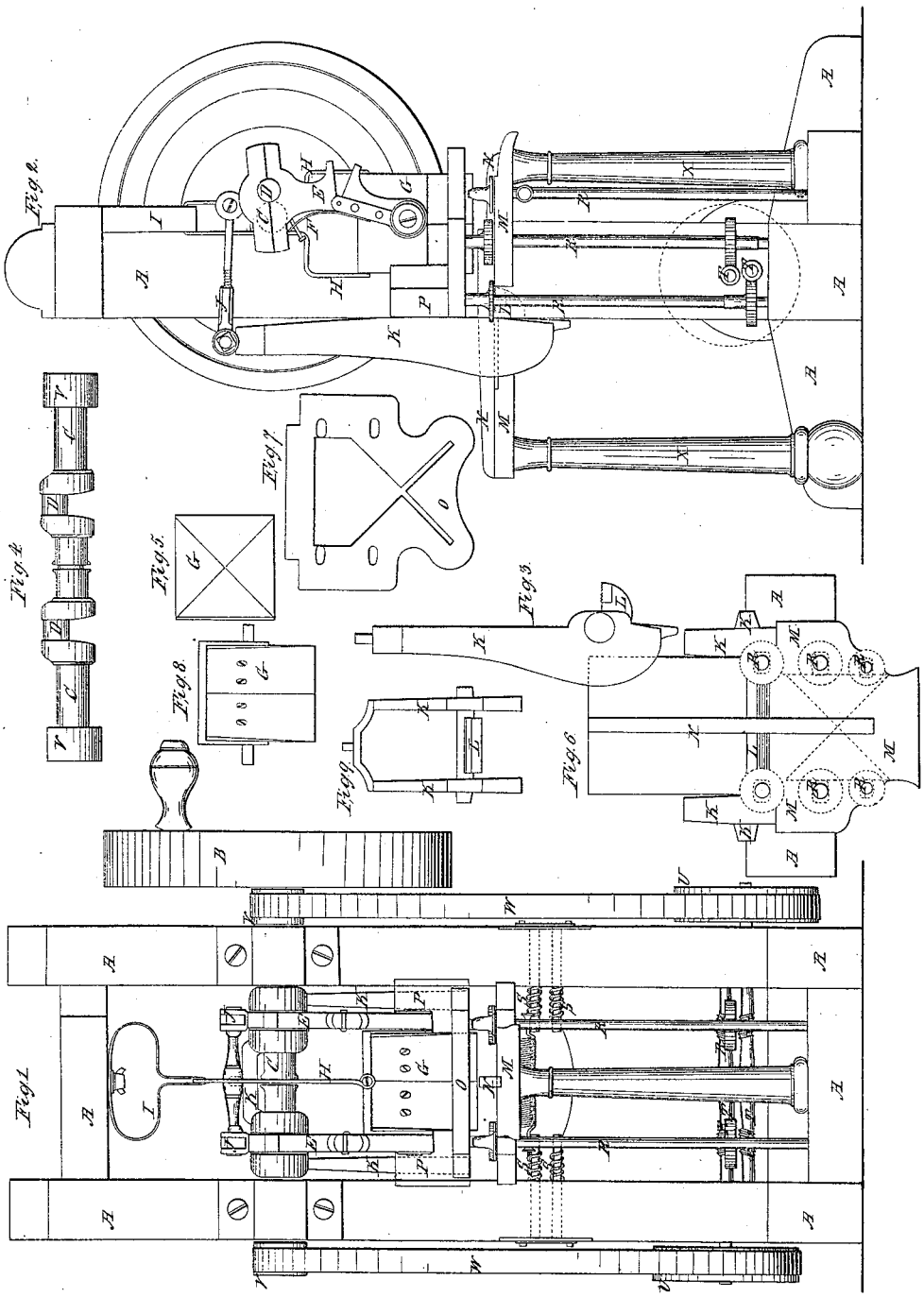
L. Smith,

Making Matches.

No. 5,496. Patented Mar. 28, 1848.



UNITED STATES PATENT OFFICE.

LEWIS SMITH, OF NEW YORK, N. Y., ASSIGNOR TO BENONA HOWARD.

MACHINERY FOR SPLITTING MATCH-SPLINTS.

Specification forming part of Letters Patent No. 5,496, dated March 28 1848; Reissued March 11, 1856, No. 359.

To all whom it may concern:

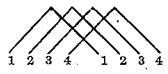
Be it known that I, LEWIS SMITH, of the city, county, and State of New York, late of Brandon, Rutland county, State of Vermont, have invented a new and Improved Machine for Splitting or Cutting Blocks for the Purpose of Making Match-Splints; and I do hereby declare that the following is a full and exact description of the machine and improvements claimed therein.

The nature of my invention consists in the combination of certain cranks, levers, cutters, and feeding gearing, for the purpose of cutting in a more expeditious and economical manner blocks of wood of suitable sizes, into match splints. To effect these operations two crank centers are turned on the driving or main shaft, on which are attached two jointed levers to work the cutters. These levers are made with an elbow joint, and have stiffeners or springs at the back of the joints, to throw them out of joint when the cutters have ceased to find any resistance in the splitting of the block. To the tops of the cap pieces connecting the jointed levers to the cranks two arms are jointed the other ends of which are similarly connected to a crossbar, through the middle of which is a socket, into which, fits a pin on the crosshead of the crimping or compressing levers for the purpose of working them by the aforementioned cranks on the main shaft. The fulcrum of these levers works in caps attached to the upright side pieces of the frames. On the lower end of each lever is a crimper or compresser, faced with steel, at right angles to the fulcrum and forming the whole into a right-angled lever. A girt, of iron, is bolted to the frame, the lower face of which is so shaped, as to project about the 32d of an inch below the face of the cap plate of the feeding apparatus, so as to oppose a broad and solid surface to the upper side of the block, while it is in process of being matted on its lower side, by the action of the crimping or compressing lever. When the block has been compressed on its lower surface the cap plate, and feed ratchet wheels which have a retrograde motion to the block, while it is being compressed by the action of the long arms of the crimping lever, are pushed forward, so as to admit of the cutters taking up a new splint, on again entering the block, the block being also carried forward between the intervals of compression by means of the ratchet feed wheels on the perpendicular shafts, driven by screw threads, on two horizontal shafts gearing into pinion wheels at their lower ends. But to describe the parts more particularly, reference will be had to the drawings.

Figure 1, is a back view of the machine. Fig. 2, a side view, having one of the upright side pieces removed. Figs. 3 and 9 are views of the crimping or compressing lever. Fig. 4, a view of the main shaft, with the crank centers for working the jointed levers and cutters; and driving pulleys of the feeding gear. Fig. 5, a reversed view of the setting of the cutters, and Figs. 6, 7 and 8, are representations of the lower and top feed boards and cutting box.

The same letters represent the same parts in each view.

Letters, A, A, &c. Figs. 1 and 2, frame of the machine. B and B driving pulley on the main shaft. C, C, C &. Figs. 1, 2 and 4, main shaft of the machcine.

D, D, D &c. Figs. 1, 2 and 4, are crank centers on the driving shaft, to work the crimping lever K, and jointed levers E, E and E (Figs. 1 and 2), attached to the cutting box or frame of cutters G, G, by their lower ends, by a pin or screw on which it works as on a center to the vibratory motion of the cranks. Letter F, Fig. 2, represents one, of two springs, at the back of the joints of the jointed levers E and E, and attached to their lower legs, for the purpose of throwing them out of joint when the cutters have ceased to find any resistance, and thereby avoiding the splitting of the block entirely through its crimped or matted surface; letters G, G and G, Figs. 1, 2 5 and 8 cutting box or frame to which the four cutters or knives are attached, and setting in such a manner as to intersect each other at their center, so as to make a perfect cross of the square, and splitting the blocks for the matches in this shape, so that at each feed of the machine the front knives, cross the split made by the back knives at the angle of the split, thus 

1, 1, first cut of knives, 2, 2, second cut—3, 3, third cut &c.; letters H and H, H, Figs. 1 and 2, steadying hook,

attached to the cutting box to prevent it from being thrown forward when the crank begins to force it down; I and I, I, Figs. 1 and 2 a steel loop, attached to the top cross piece by the middle of the loop and guiding the steadying hook.

J, J and J, Figs. 1 and 2, are two arms connected by a cross bar at one end, and attached by means of joints to the heads of the levers E and E, so that, when the machine is in motion the cranks D, D work them backward and forward. By means of a pin or key bolt through the crossbar connecting the arms J, and J as shown by the dotted lines in Fig. 1, and in Figs. 3 and 9 on the head of the levers K and attached to the cross head of the crimping or compressing levers K, are connected the arms J and J on the heads of E and E, to the crimping levers, which are worked, on fulcrums about on a line with the crimper L and are secured in boxes to the side posts of the frame; on a line with the bottom feed board of the machine. The crimper L Figs. 3 and 9 is at about right angles to the said fulcrum, making together with it, a right angled lever, the short leg of which works up between a space in the bottom feed board of the machine (see L Fig. 6) so as to compress or mat the bottom surface of the match timber, before being split, but while being fed into the machine, in such a manner, that when the matches are split, they will yet remain matted together on their lower sides, with sufficient strength to admit of being handled for dipping, packing &c., without the necessity of gluing or other arrangement for heading them preparatory to dipping. M M and M Figs. 1, 2 and 6, the feed or bottom board of the cutting machine, divided into two parts, so as to admit of the crimper L, see Fig. 6, acting upon the bottom of the match timber or block; on the front side of which (the bottom board) the match timber is placed at each side of the guide piece N and N N Figs. 1, 2 and 6 and fed in by hand, until the ratchet toothed feed wheels, on the ends of the perpendicular shafts, R R &c., takes hold of the sides of the blocks and carries them under the cutters, after having been matted by the crimper or compresser, while on their passage to the cutters.

N and N, N, Figs. 1, 2 and 6 is the guide or straight edge running lengthwise of the feed board, against which the blocks are pinched or held, while feeding to the cutters.

O, and O, Figs. 1, 2 and 7 is the cap plate of the feeding apparatus, having slots to admit of the cutters to pass through, and a ▽ shaped section cut out of the plate, next to and under the girt piece P and P, P (Figs. 1, 2, and 7) and through this section a similarly shaped portion on the lower side of the girt piece extends below the lower face of the cap plate about the 32nd part of an inch, and against this portion the upper side of the match timber presses, when the crimper or compresser is matting the under side of the timber or blocks. When the machine is in motion cutting the matches, the cap plate is drawn back the length of the feed, by the rolling action of the ratchet wheels against the sides of the blocks, they being then confined between the projecting parts of the girt piece, through the cut section of the cap plate above, and the crimper on the short leg of the lever K below. When the cap plate has been drawn back, and the knives have done their work, the block is then released by the crimper, or short leg of the lever K, and in doing this the arms J and J, draw back the long legs of the crimping lever K, and push back the cap plate, and with it the upper ratchet pivots on the perpendicular shafts and blocks a sufficient distance for the knives to cut a new splint.

The shoulder or projection on the under side of girt P is much broader on its face than the edge of the crimper, so as to avoid matting the upper sides of the blocks. R R and R R &c. Figs. 1 and 2, perpendicular shafts standing or resting on steps in the lower cross piece of the frame, and their upper ends extending through openings in the bed plate M, of the machine into oblong sockets crosswise in the cap plate O, so as to admit of adjusting to the widths of the blocks by means of spiral springs on short arms, supporting them against the side pieces of the frame.

On the lower ends of four of the shafts are small pinion wheels gearing into screw threads cut on the surface of two horizontal driving shafts; and on their upper ends, and between the bed board and cap plate, are four ratchet feed wheels, for the purpose of feeding in the blocks. The two back and outermost of the upright shafts are independent of the feeding gear, having only a button at their tops to bind together, (by means of a spiral spring which connects them together), the matches as they pass from the cutters.

Letters S S and S S, Fig. 1, are four short arms, their ends fitting into sockets in the sides of the uprights of the frame, and having a semicircular notch in their ends to support the perpendicular geared shafts, and feed ratchets, up to the blocks, by means of spiral springs on them, acting as self regulating adjusters of the feed ratchets to the various widths of the blocks.

T T and T T Figs. 1 and 2, are two horizontal shafts gearing by means of screw threads on them into pinion wheels on the lower ends of the perpendicular feed shafts, and driven by means of a pulley on the end

of each of the shafts, and bands from the pulleys on the main shaft C.

Letters U U &c. Figs 1 and 2, are pulleys on the ends of the horizontal shafts for driving the feed gearing. V, V Figs. 1 and 2 pulleys on the main shaft C, for communicating motion to the feed gear. W, W Figs. 1, 2 bands connecting the main shaft pulleys to the feed gear pulleys, to drive them. X X &c. Figs. 1 and 2 two posts to support the bed or feed board of the machine.

Having now described all the parts of the machine and their operations, I will proceed to state what I claim as my invention and desire to secure by Letters Patent.

1. The combination of the knives and cutting box G, with the steadying hook H, and levers E and E, and cap plate O, for the purpose of cutting the match splints, as the block or blocks are being fed through the machine.

2. The combination of the jointed levers E and E, having a spring at the back of their joints for the purpose of throwing them out of joint when the cutters have ceased to find any resistance in splitting, and thereby avoiding the cutting of the block or blocks entirely through its crimped or matted surface; and their combination with the cutters for working them, and the crank motion for working the crimping or compressing lever K.

3. The combination of the crimping or compressing lever K and L, with the bed or feed board M for crimping or matting the lower surface of the block or blocks.

4. The combination of the shafts R, R, R, and ratchet feed wheels, with the cap plate O, and bed plate M for the purpose of feeding the blocks through the machine.

5. The general combination of the several parts, I have specified in the foregoing claims and application of the same to the purposes herein substantially described.

LEWIS SMITH.

Witnesses:
DAVID PINCKNEY,
JAMES YOUNGS.

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