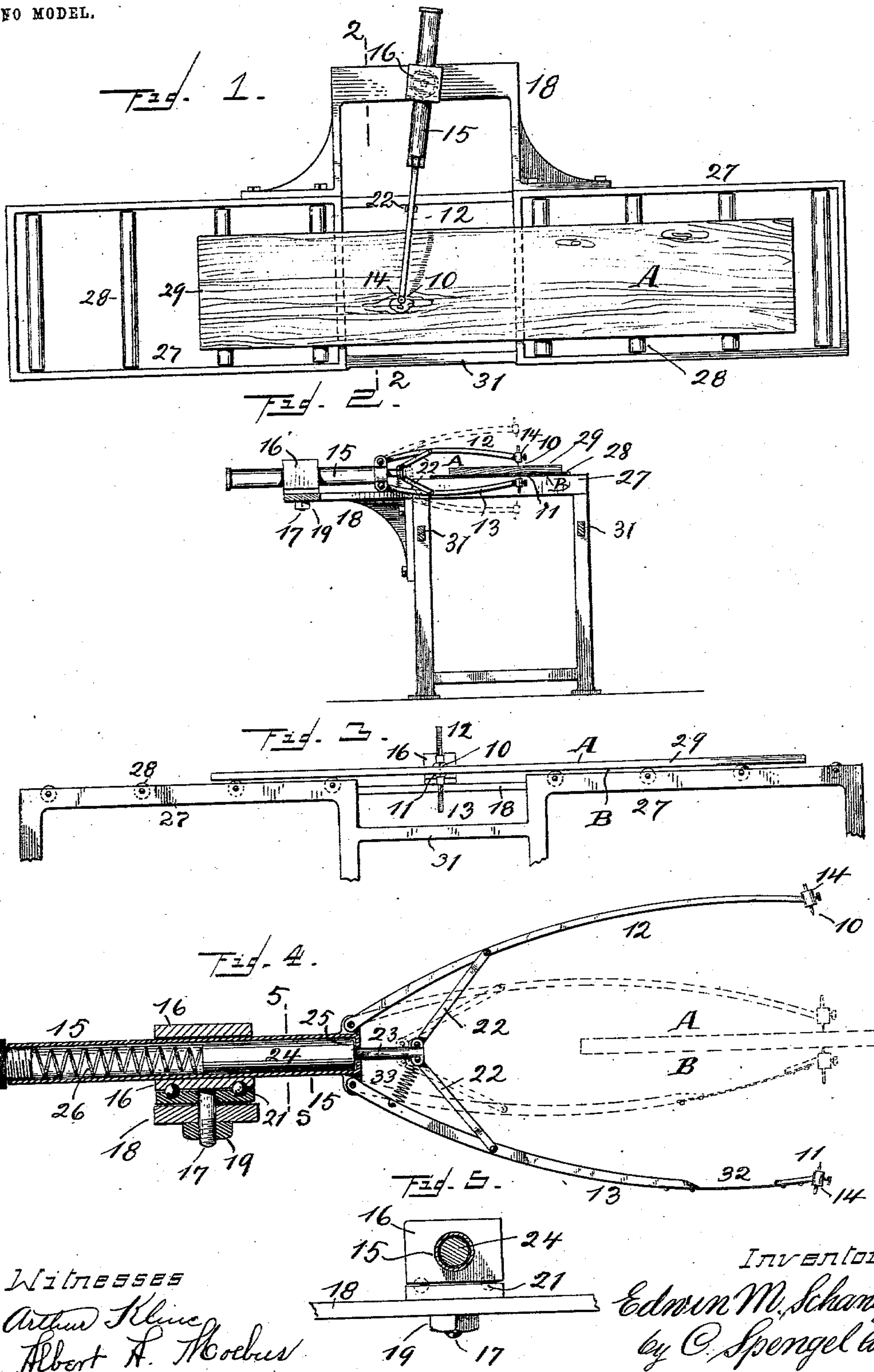


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E. M. SCHANTZ.  
 DUPLICATING DEFECT TRACER.  
 APPLICATION FILED JULY 18, 1903.

NO MODEL.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## DUPLICATING DEFECT-TRACER.

SPECIFICATION forming part of Letters Patent No. 753,005, dated February 23, 1904.

Application filed July 18, 1903. Serial No. 166,119. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN M. SCHANTZ, a citizen of the United States, residing at Zimmerman, Green county, State of Ohio, have  
 5 invented a certain new and useful Duplicating Defect-Tracer; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying drawings, with the reference characters  
 10 marked thereon, which form also a part of this specification.

This invention relates to a duplicating tracer and marker and may be used on the surface of any kind of material of limited thickness,  
 15 like paper, cloth, pasteboard, wood, &c., and where such material is to be marked and subdivided for any purpose—as, for instance, for subsequent cutting up in smaller pieces. It may be used in connection with a marking-  
 20 machine patented to me on July 28, 1903, and which machine serves to mark the cutting-lines on wood or lumber where such lumber is to be subdivided and cut up in smaller pieces or so-called “dimension” stuff. If used in such  
 25 connection, the use of this present device precedes the use of such marking-machine. An adjustable marking-guide is used in said machine to guide a suitable marking implement, pencil, or chalk while the same is held in the  
 30 hand and moved over the surface to be marked off. In adjusting such marking-guide due notice is taken of the presence of any defects in the lumber, like knot-holes, worm-eaten spots, bark near the edges, &c., the object be-  
 35 ing to cut up the lumber to the best advantage and so as to entail the least waste in obtaining clear and perfect pieces, and the marking-lines are arranged and run accordingly. When lumber has to be clear and perfect only  
 40 on one side, the marking of the cutting-lines presents no difficulty, since any defects present may be readily observed. When lumber has to be perfect and clear on both sides, note has to be taken of defects on both sides, since the  
 45 presence or absence of a certain defect on one side is no indication that the same defect is present or absent on the other side. Thus a clear piece of lumber might have been marked off on one side, and yet on turning over it may  
 50 be found defective on the other side, and there-

fore useless for the intended purpose. Worm-eaten places or bark, for instance, might be present on one side only. Knot-holes might pass through the wood obliquely and come out on the other side on a different spot. 55

The leading object of this invention is therefore to present on one side for simultaneous observation all the defects in a board on its two sides, so that the marking-lines on which the lumber has to be cut may be run intelli- 60 gently on the one side under observation and with all defects before the eye for due consideration. This is done substantially by representing, preferably by pencil or chalk line, the defects of one side on the other, so that 65 such other side shows all defects of both sides of the board, its own defects appearing just as they are, while those on the other side appear by imitation, being represented by said lines. All defects on both sides are thus placed 70 before the eye, and the marking-lines to indicate the cutting-lines may now be run accordingly on the one side and so as to avoid all defects, no matter on what side they are. The implement whereby the defects on one 75 side of the lumber are thus accurately and in the exact position represented on the other side of the board forms the subject of this invention.

In the following specification, and particularly pointed out in the claims thereof, is found a full description of the implement, together with its manner of use, parts, and construction, which latter is also illustrated in the accompanying drawings, in which— 85

Figure 1 shows a top view of the implement with a suitable support or table on which the material (lumber) rests while being handled. Fig. 2 is a vertical cross-section on lines 2 2 of Fig. 1. Fig. 3 shows the upper 90 part of a front view of the device as it appears in Fig. 1. Fig. 4 is an enlarged side view of the implement with parts in section. Fig. 5 is a cross-section of it on lines 5 5 of Fig. 4. 95

10 and 11 are two marking-points, of which the latter should be of a material which in its use produces a line, such as is done by lead-pencils, chalk, carbon, or any other prepared material. Point 10 may be merely a steel- 100



pointed tracer; but I prefer to have it of the same or a material analogous to point 11. These points directed toward each other are carried at the outer end of two arms 12 and 13, to which they are secured by suitable holders 14 in a manner customary in such devices. The arms are each pivotally secured to a sliding head 15, which is fitted into a box 16, so as to be held therein in a position substantially horizontal, but free to slide back and forth. This box is swiveled or pivotally mounted in a manner permitting it to be rotated in a horizontal direction about a vertical axis, the arrangement being such as to prevent any interference with the sliding adjustment of head 15. In detail this construction may be by means of a pivot 17, mounted on a bracket 18, and to which it is held by a nut 19. Friction-reducing balls 21 may be interposed between box and bracket. Arms 12 and 13 are attached so as to be in a vertical plane one below the other, and they are also connected to each other in a manner that if one is moved on its hinged connection the other one will also move, and this movement is such that they will either approach each other or move apart. For such purpose I use links 22, hingedly connected to each arm, and of which each is also connected to a push-rod 23, which, with its inner part 24, is fitted into the sliding head 15, the same being for such purpose preferably in shape of a hollow tube. The inner part or end of this push-rod is arranged in a manner which prevents it from entirely leaving head 15, which may be done in any suitable way—as, for instance, by enlarging said part 24 and by providing a stop or shoulder 25 at the outer end of head 15, which prevents said enlarged part from passing out. Behind this enlarged part 24 there is a spring 26, which by bearing against the inner end of push-rod 23 keeps the same in a position as far out as the enlarged part 24 permits, thereby holding arms 12 and 13 in a certain position and a certain distance apart, and, as shown in dotted lines in Fig. 2 and in full lines in Fig. 4, such position being their normal one.

Bracket 18, which carries this entire device, may be secured in any suitable way. I prefer, however, to attach it to the support or table upon which the lumber rests while being manipulated. This table consists, preferably, of two sections 27, with a gap between them, in which the implement may be swung for adjustment and manipulated for use, as best shown in Figs. 1 and 2. The tops of these table-sections may consist of rollers 28 to facilitate the moving and sliding of the lumber, (indicated at 29.) Bracket 18 may be arranged and connected in a manner in which it also serves to connect the two table-sections for the purpose of holding them in their proper relative position with reference to each

other. This connection may be aided by additional braces 31.

The use of the device is as follows: A piece of lumber 29, which is to be cut up for any purpose or for so-called "dimension" stuff of certain fixed sizes and the cutting-lines for which purpose are to be marked on it, is thrown upon the table. It is further presumed that the pieces to be gained from cutting up such larger piece should be clear of all or certain defects on both sides, which requires that the marks which are to indicate cutting-lines should be run accordingly. To do this successfully requires that all defects on both sides of the board be simultaneously before the operator for observation. For such purpose I proceed by moving the piece of lumber until the first defective spot on the upper side is between the gap of the table. The upper point 10 is now lowered against side A of the lumber, and said point is run around the defective spot, so as to properly locate and define the same. This may be readily done because the sliding head 15 and the swiveled box 16 permit said point to be freely moved over the board in all directions. The lowering of point 10 causes at the same time point 11 below to rise up and come in contact with the under surface B of the board, and said points moving also together in a horizontal plane—that is, one following the other and point 11 pointing upwardly—it is clear that whatever lines are described by point 10 on surface A will be exactly reproduced by point 11 on surface B. In this manner all defects on side A are traced and by copy are transferred onto side B, so that when the board is presently turned over to bring side B up this latter will show its own defects, and in addition it will also show the defects of the other side by the copies of their tracings and which occupy a position exactly like the one of the corresponding real defect on the other side. The lines and marks to indicate the lines on which the board is to be cut and subdivided may now be intelligently arranged and run, because all defects are simultaneously before the operator. For so running these marking-lines other means are used, and as far as this particular board is concerned the use of my implement terminates, except, perhaps, table 27 might be used to support the board at that time. For running such marking-lines independent means like rules, gages, straight-edges, &c., are used, or my marking-machine, as described in the patent mentioned, may be employed for such purpose. Since point 10 is merely used as a tracer and not as a transferer, it need not be a pencil, but may be simply a steel point. I prefer, however, to use a pencil, so as to show exactly to the operator what he is transferring on the other side, thus preventing omissions and mistakes.

All or part of the lower arm 13 is prefer-



ably elastic, so as to be free to exert a slight pressure to maintain the pencil or chalk in marking contact and follow any unevenness in the surface of the board. I do this by attaching a piece of steel 32 to this arm, which carries holder 14 for lower point or pencil 11. The raising or lifting of this arm 13 may also be assisted by a spring 33, which supports its weight.

10 Having described my invention, I claim as new—

1. In a duplicating defect-tracer for the purpose described the combination of a table consisting of two parts with a gap between 15 them, two points, one being a tracer and the other a transferrer, a frame supported in the gap mentioned and on which these points are carried, a spring operating to hold them normally a fixed distance apart and means operatively connecting them in a manner that if 20 one is moved toward the other this latter is caused to move also, approaching the moved point, while if one is moved in a direction at right angles to the movement first mentioned, 25 the other is caused to follow the moved point, both moving then together at a maintained distance apart.

2. In a duplicating defect-tracer for the purpose described, the combination of a tracing and a transfer point, a support whereby 30 the material may be held between these two points, arms, at one end of each of which these points are carried, one being arranged below the other, a support to which the other

ends of each of these arms are attached, said 35 support being pivotally mounted whereby the two arms may be swung simultaneously about in a horizontal plane and means connecting the arms to each other and operating so that if one arm is moved in a vertical direction 40 the other is caused to move also vertically but opposite thereto.

3. In a duplicating defect-tracer for the purpose described, the combination of a tracer and a transfer point, an arm for each at one 45 end of which it is carried, a sliding head to which the other end of each of these arms is hinged, a push-rod supported in this sliding head, links connecting it to these arms, a spring operating in a manner to normally 50 keep the free ends of these arms apart, a swiveled bearing for the sliding head and means to support lumber in a manner that it may occupy a position between the tracer and transfer point, the operation being such that 55 when the tracer-point is caused to bear against one side of the material, the transfer-point comes automatically in contact with the other side of this material after which, when one point is moved, the other follows automatically over the material. 60

In testimony whereof I hereunto set my signature in the presence of two witnesses.

EDWIN M. SCHANTZ.

Witnesses:

C. SPENGEL,

ALBERT H. MOEBUS.