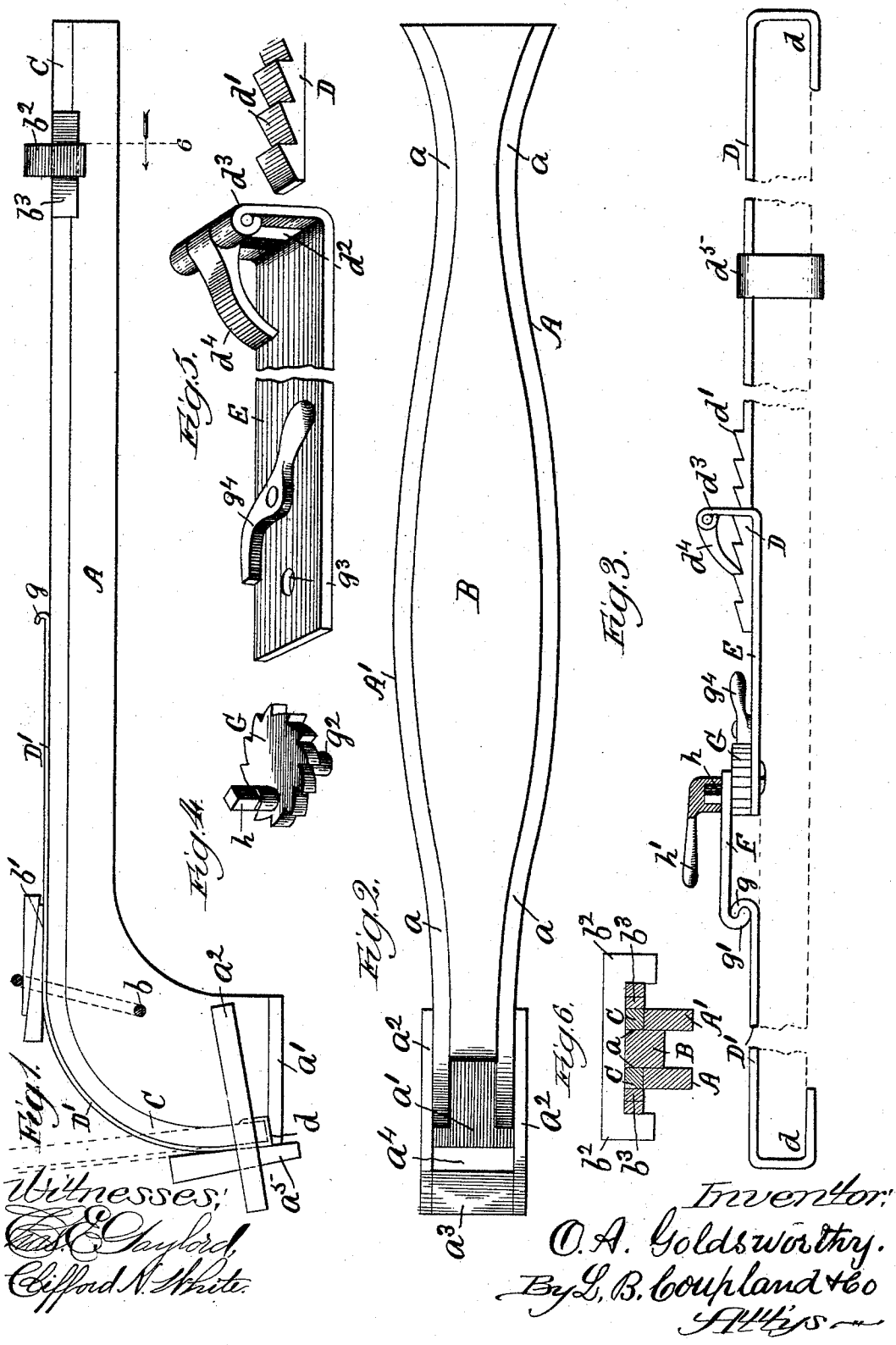
(No Model.)

# O. A. GOLDSWORTHY.

## BENDING VEHICLE SHAFTS.

No. 482,475. Patented Sept. 13, 1892.



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# UNITED STATES PATENT OFFICE.

ORLANDO A. GOLDSWORTHY, OF CHICAGO, ILLINOIS.

## BENDING VEHICLE-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 482,475, dated September 13, 1892.

Application filed October 5, 1891. Serial No. 407,699. (No model.)

*To all whom it may concern:*

Be it known that I, ORLANDO A. GOLDSWORTHY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bending Vehicle-Shafts, of which the following is a full, clear, and exact description that will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of a form embodying my improved features; Fig. 2, a plan; Fig. 3, a side elevation of the clamping mechanism; Figs. 4 and 5, broken away detached details of the same; and Fig. 6, a transverse section on line 6, Fig. 1.

This invention relates to an improved means for bending vehicle-shafts, as will be hereinafter set forth.

The form consists of the two side members A A′ and the central part B, which are of the outline it is desired to impart to the shafts, as shown in Figs. 1 and 2.

The central part B of the form is higher than the companion side members, Fig. 6, so as to provide the recess or offset $a$ on each side to receive the shafts C, a pair of shafts being bent at the same time in each form. The downwardly-curved end of the form is provided with the bottom board $a'$, on which the heel end of the shaft-bars will rest when being inserted in the form, as shown in Fig. 1. The respective side members of the form have the bars $a^2$ $a^2$ rigidly secured to the back ends thereof, the projecting ends of the bars being connected by the cross-bar $a^3$, leaving the opening $a^4$ for the insertion of one or more locking or clamping wedges $a^5$ in locking the heels of the shafts in the form.

The lower end of the elongated link $b$ is inserted through the form from side to side, the upper end extending above the bed of the form so as to permit of the driving in of the locking-wedges $b'$ between the link and shafts, as shown in Fig. 1. The front ends of the shafts are pressed into and locked in place with reference to the form by means of the angle-clamp $b^2$ and the wedges $b^3$.

The shaft-bars are first properly steamed and then just before being locked in the form are subjected to a heavy pressure from both ends simultaneously by mechanism that will now be described.

In Fig. 3 the different parts are shown in a working position, the relative position of the shaft-bar being indicated in dotted lines. This endwise-clamping mechanism consists of the two end strap-plates D D′, the central plate E, and the connecting-link F. The strap-plates D D′ are bent around, as at $d$, to engage with the respective ends of the shaft-bars. The strap-plate D has a number of teeth $d'$ formed on the inner end thereof. In operation this part of the plate D is inserted through the aperture $d^2$, Fig. 5, in the upturned end $d^3$ of the plate E, having the pawl $d^4$ pivoted therein, and which is adapted to engage with said teeth, as shown in Fig. 3. The band $d^5$, attached to the plate D, slips on over the shaft from the end when the plate D is being placed in a working position, and serves to assist in retaining the same in place. The inner end of the strap-plate D′ terminates in the hook $g$. The joining end of the strap F is provided with a similar hook $g'$, these parts interlocking, as shown in Fig. 3. The opposite end of the strap F is connected to the ratchet-wheel G. The eccentric ratchet-wheel G is provided on one side with the stub-shaft $g^2$, which is adapted to engage with the aperture $g^3$ in the plate E. The hand-dog $g^4$ is pivoted to the plate E and serves to hold the ratchet-wheel in a locked position. The post $h$ is fixed in the ratchet-wheel at one side of the center and receives the handle $h'$. By means of this appliance a great endwise pressure is had on the shafts, so as to prevent any cracking or checking in the grain when bent into the required shape.

In operation the shaft-bars as soon as the process of steaming is completed are inserted in the clamping mechanism, the different parts being connected together in the manner described, and subjected to a heavy end-pressure, a slight turn of the ratchet-wheel being sufficient to exert a great strain. The shafts are next placed in the form, the first position being indicated by dotted lines in Fig. 1. The heels of the shafts are now locked by the wedges $a^5$. The shafts are next bent down to the form and the wedges $b'$ inserted. All of the endwise-clamping mechanism, except the strap D′, is now removed and the front ends

of the shafts forced into position in the form and locked by the clamp $b^2$ and the upper wedges $b^3$, where they are allowed to remain until set. Thus the same clamping mechanism may be used with any number of forms, the strap-plate D′ being the only part duplicated.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a form for bending vehicle-shafts, the combination of the companion side members curved at their rear ends, the central part projecting above said side members, the bottom board $a'$, the bars $a^2$, the cross-bar $a^3$, the locking-wedges $a^5$, the elongated link $b$, the wedge $b'$, the angle-clamp $b^2$, and the wedges $b^3$, whereby the object may be rigidly locked in the form, substantially as set forth.

2. In an endwise-clamping mechanism for vehicle-shafts, the combination of the following elements, viz: the strap-plate D, having one end bent around to conform to a shaft-bar and the other end provided with ratchet-teeth, the companion strap-plate D′, having a hook on the inner end, the connecting-plate E, having one end upturned and perforated to receive the end of the plate D, the pawl pivoted in said upturned end, the connecting-link E, the eccentric ratchet-wheel G, seated in the plate E, and the connecting-link F, whereby a strong pressure is exerted on both ends of an object clamped therein, substantially as set forth.

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