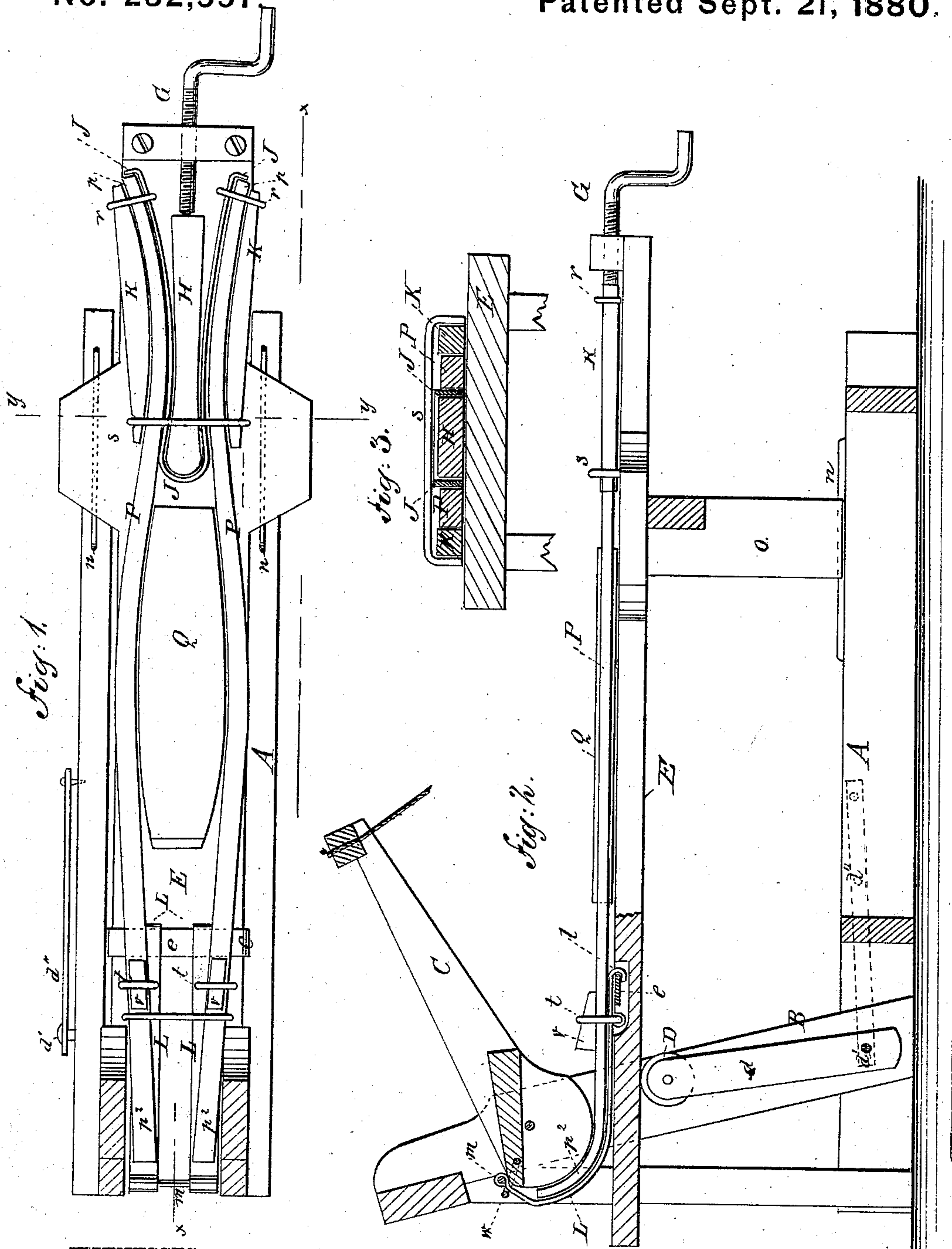


(No Model.)

J. H. SMITH.  
Shaft Bending Machine.

No. 232,557

Patented Sept. 21, 1880.



WITNESSES:

*Chas. Nida*  
*C. Sedgwick*

INVENTOR:

*J. H. Smith*  
BY *Mum & Co*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

JOHN H. SMITH, OF BLUFFTON, INDIANA.

## SHAFT-BENDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 232,557, dated September 21, 1880.

Application filed May 15, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. SMITH, of Bluffton, in the county of Wells and State of Indiana, have invented a new and useful Improvement in Shaft-Bending Machines, of which the following is a specification.

My invention relates to a machine for bending shafts or thills for buggies and other vehicles.

The invention consists in a novel construction and arrangement of straps and formers, a screw, a cam-lever, and a frame or table, whereby provision is made for simultaneously bending the heel and the point of both of the shafts of a pair.

In the accompanying drawings, Figure 1 is a top view, partly in section, of an apparatus embodying my improvements. Fig. 2 is a longitudinal vertical section taken in the line  $x$   $x$  of Fig. 1. Fig. 3 is a transverse section taken in the line  $y$   $y$  of Fig. 1.

Similar letters of reference indicate corresponding parts.

A represents a frame, provided near one end with a standard, B, in which work a cam-lever, C, in the upper portion, and a friction-roller, D, carried by pivoted arms  $d$ , in the lower portion. The arms  $d$  are pivoted on a shaft,  $d'$ , at the outer end of which is keyed a lever,  $d''$ , by which the arms are swung to or from the highest point to raise or let down the board E.

E represents a board, having at one end a screw, G, and near the other end a transverse bar,  $e$ , for the purpose hereinafter described.

H represents a former, consisting of a block, of wood, of a shape approximating to that of a very eccentric or elongated ellipse.

J is a strap, consisting of a piece of strap-iron, bent midway of its length to conform to the shape of the former H, and having its ends turned outward transversely of its length.

K K are two formers, each of which is of a shape approximating to that of a half of a very eccentric or elongated ellipse.

Q is a former adapted to bend outwardly and shape the widest parts of the shafts.

L L are two straps, each of which has one

end bent to form a hook,  $l$ , and the other end is formed into an eye, through which passes a rod or bolt,  $m$ .

The shafts or thills P are laid on the board E, with the formers Q between them. The strap J is placed between the former and the shafts, so that the out-turned portions of the strap J will engage the extreme ends of the shafts P. The formers K K are placed outside of the shafts P, and secured by staples  $r$  and  $s$ . The rear ends of the shafts are laid on the straps L, and secured by staples  $t$  and wedges  $v$ . The board E is then placed in position in the frame A, so as to rest on the pulley D, with the cam portion of the lever C bearing on the shafts P. The rod  $m$  is connected to the cam portion of the lever by a loop,  $w$ , pivoted at the upper part of cam, and through which the eye-straps L are passed before the pin  $m$  is inserted and said lever is pulled downward by means of a cord,  $c$ , so as to bend the heel portions  $p^2$  of the shafts and draw the board E forward on the pulley and ways  $n$ , over which fit the bottom-grooved legs  $o$ . The screw G is tightened, so as to bear on the end of the block or former H to bend the point portions  $p$  of the shafts. By this means the heels and points are bent simultaneously on both shafts.

I am aware that formers have been applied to the ends and middle of shafts, and that the end screw, G, as well as the staples or clamps that hold the formers and shaft in position, are old; but

What I claim as new is—

1. In a thill or shaft bending machine, the sliding board E, having bottom-grooved legs  $o$ , movable on ways  $n$ , the cam-lever C, and straps L, in combination with the bottom-hinged arms  $d$ , having end rolls at the upper end, as and for the purpose described.

2. The combination of the eye-straps L, pin  $m$ , and pivoted loop  $w$ , to hold the shaft to the cam-lever, as set forth.

JOHN H. SMITH.

Witnesses:

W. S. KAPP,

DAVID RINEHART.