

(No Model.)

A. C. IRVINE.

METAL CUTTER.

No. 384,694.

Patented June 19, 1888.

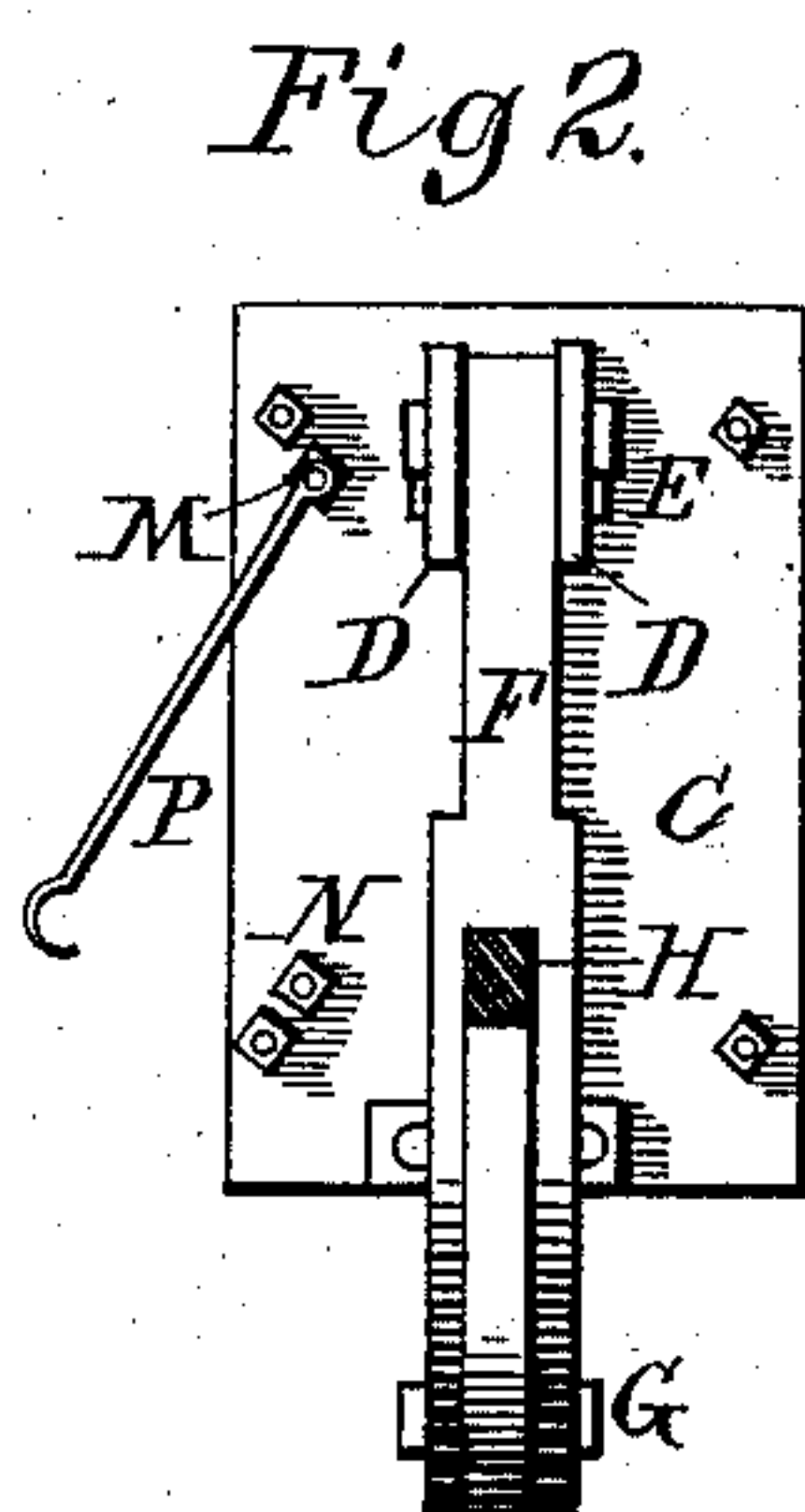
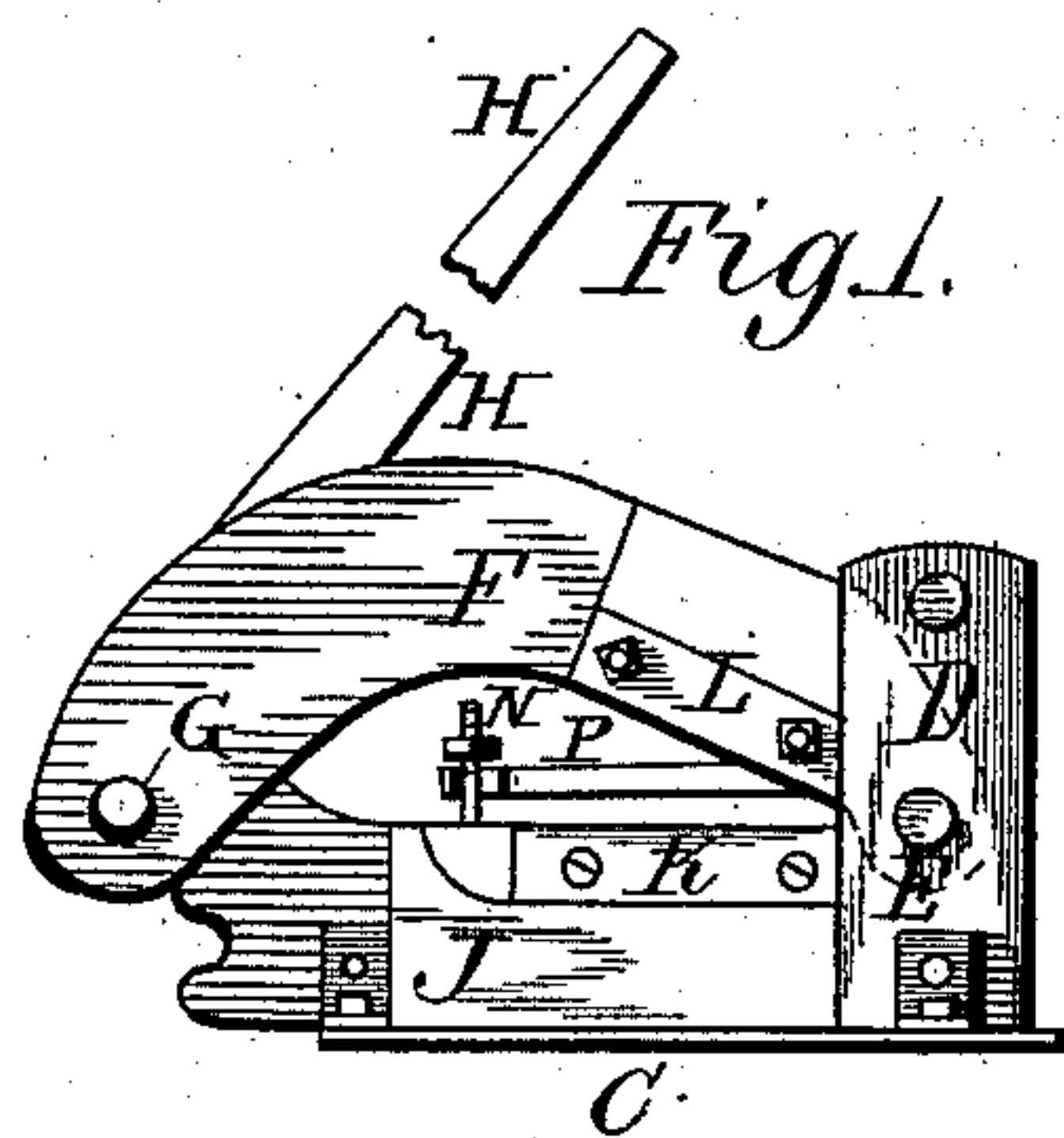


Fig. 3.

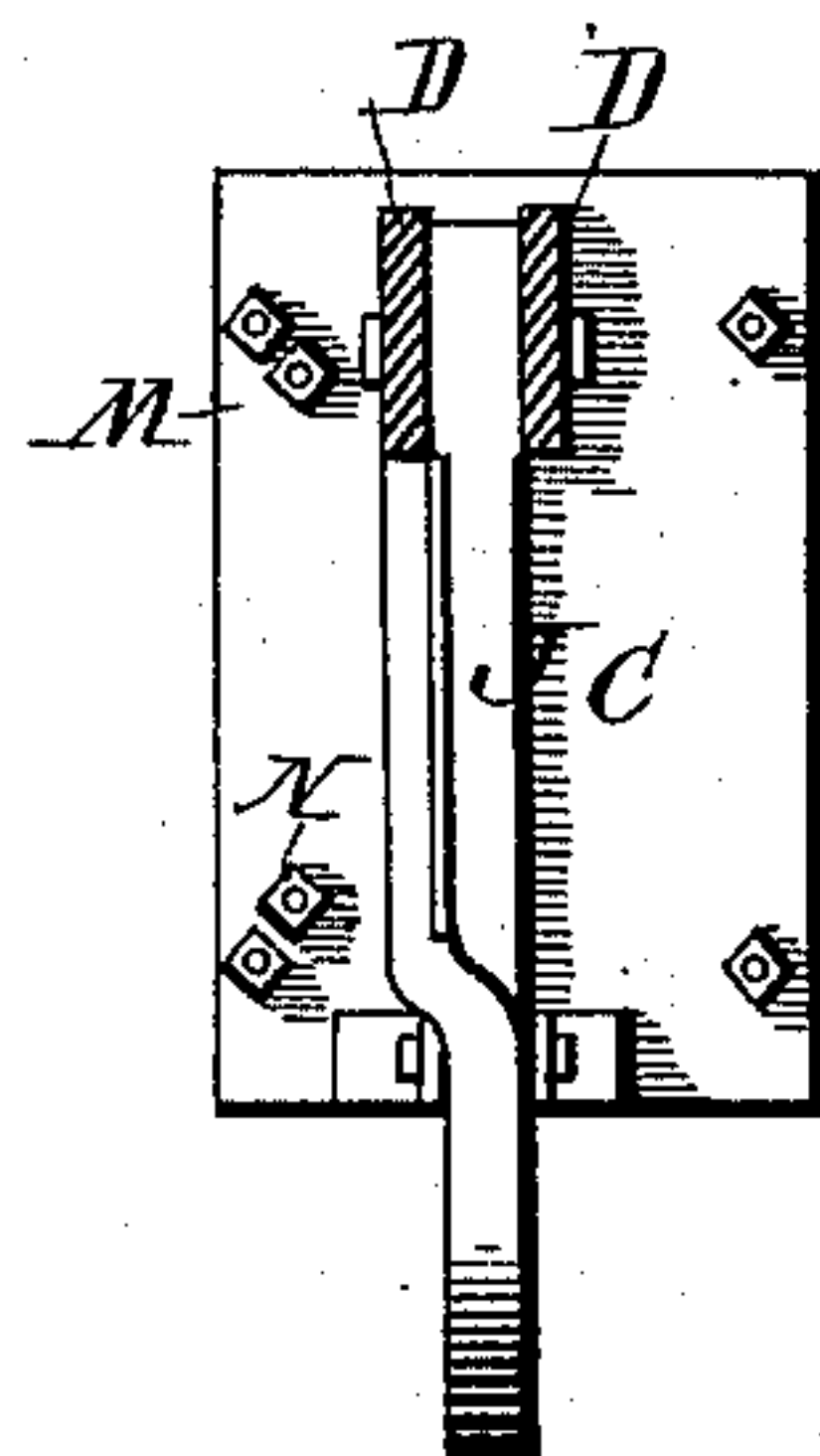
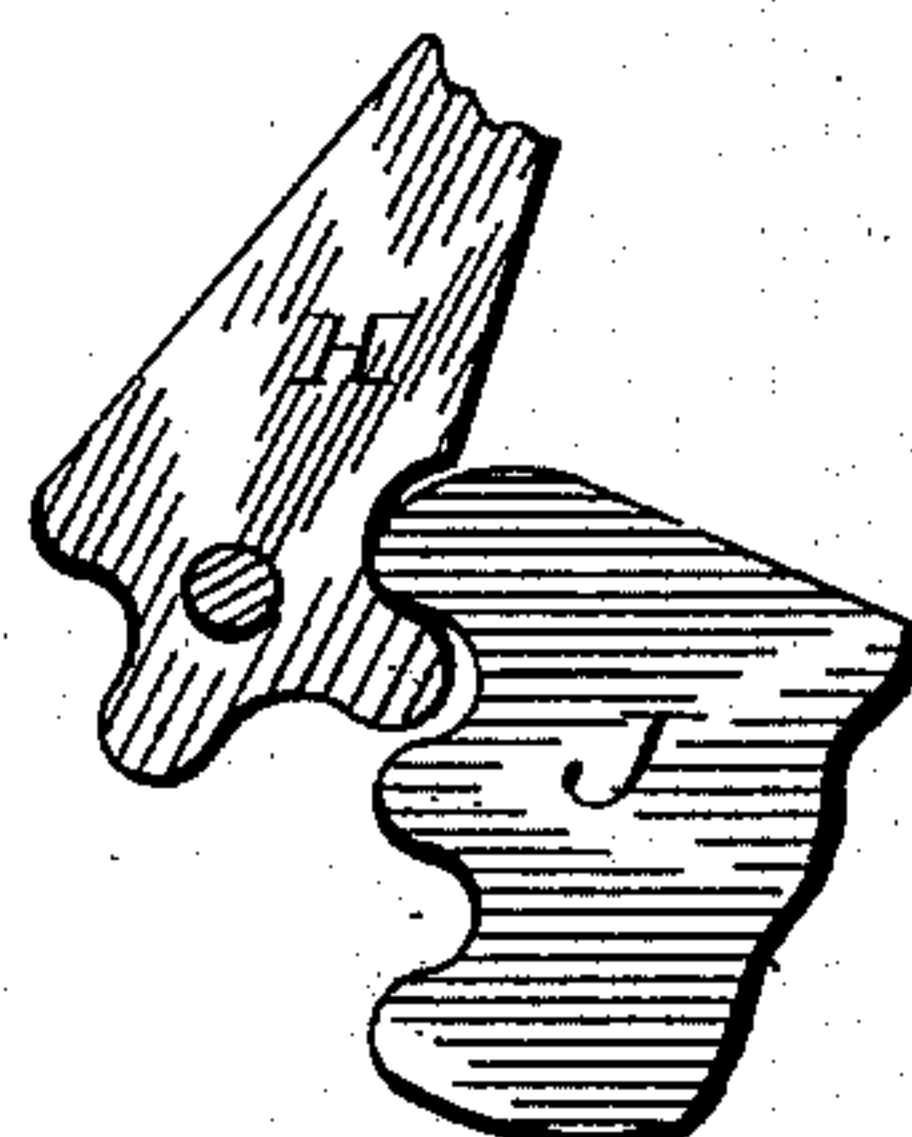


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

ALBERT CORRY IRVINE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
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METAL-CUTTER.

SPECIFICATION forming part of Letters Patent No. 384,694, dated June 19, 1888.

Application filed November 17, 1887. Serial No. 255,448. (No model.)

To all whom it may concern:

Be it known that I, ALBERT CORRY IRVINE, a citizen of the United States, residing at the city of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Metal-Cutter, of which the following is a specification.

The nature of my invention is that of a flat plate of iron bearing at one end two uprights, which carry by means of a short pin a crooked piece of wrought-iron arranged in a special manner, which at its other end bears a lever, whose lower end carries a geared segment of a peculiar character, which latter works on a corresponding geared segment borne on the left-hand end of an oblong upward projection from the upper surface of the flat plate referred to above. This projection bears a steel plate fastened to its upper side, and another steel blade is fastened to the crooked piece, the two blades forming a pair of shears or scissors, worked by the lever and the two geared segments; and the object of the whole device is the presentation of a compact, strong, easily-operated, and cheap device for cutting metal bolts, bars, &c.

In the drawings, Figure 1 is a side view of my device. Fig. 2 is a view from above. Fig. 3 is a view in horizontal section at the line A A in Fig. 1. Fig. 4 is a view of a detail in the tool, hereinafter more particularly explained.

In the drawings, C, Fig. 1, is a flat plate of iron, (wrought, preferably,) which is fastened to a table or bench by the four (sometimes more) screws. (Seen in the figures, two only in Fig. 1.)

D, Fig. 1, is one of a pair of upright pillars projecting upward from the upper surface of the plate C, which pillars bear, by means of a short pin, E, a crooked piece of wrought-iron, F, Figs. 1 and 2, of shape as seen, and called the "upper-blade bar." This upper-blade bar F proceeds from the pillars diagonally upward to the left, and then at a point midway, or thereabout, between its ends diagonally downward (with a slight curvature) to a point near the platform C. At the lower edge of its right-hand portion in Fig. 1 (the part which proceeds diagonally upward to the left) the upper-blade bar F bears a steel blade, L,

screwed or riveted firmly to it, called the "upper blade," (of the shears which do the work of the device.) At the point of its change of direction above referred to the upper-blade bar is seen in Fig. 2 to separate into two bars or arms, which separation continues to its lower left-hand end. The lower ends of these arms straddle or pass, respectively, on each side of the projecting left-hand end of an oblong upward projection, J, Fig. 1, from the upper surface of the flat plate C, (see Fig. 3,) the two arms thus binding the upper-blade bar, respectively, tightly on both the right and the left hand side; and holding the loose end of the upper-blade bar, and consequently the other end (naturally capable, of course, anyway, of less divergence) and the part of the upper-blade bar between the two ends, (that part which carries the upper blade,) firmly and straight. The action of this device of the two arms thus keeps, when the tool is operated, the two edges of the upper and lower blades (the latter referred to below) close to each other without undue dependence upon the tightening of the nut or rivet (whichever may be used) at one end of the pin E. The projection J is called the "lower-blade bar," because it carries (see Fig. 1) a steel blade, K, (the lower blade of the shears,) fastened to it. The advantage of this straddling—by means of which the upper-blade bar F is enabled to hold the upper blade, L, which it carries, closely and firmly up to and in proper contact with the lower blade, K, without, as is generally the practice, depending for that purpose on the pin E—can hardly be overestimated, when it is considered that all devices of this kind hitherto made are apt to fail first through separation of the shear-blades when in action.

When the cutting corner of the moving or upper blade does not come exactly over a point, say, (if the device be theoretically perfect,) an infinitesimal distance one side of the cutting corner of the lower blade, the iron which is being cut, imperfectly softened by the heat, leaves between the two blades a portion of its substance firmly wedged there for the moment. This portion presses the two blades apart, either stretching the upset part of the pin E, Fig. 1, or, if a nut and screw are used, stretching the worm of one or both and mak-

ing certain a similar abnormal working of the tool at the next operation. In this case the rivet (or screw) is again damaged and the tool is in a constant and regular course of deterioration, and finally is practically useless. The straddling of the two left-hand ends of the upper-blade bar obviates all this. At its left-hand end the upper-blade bar bears, by means of the pin G, Fig. 1, the lower end of the lever H H, Fig. 1, (passing and working between the two bars or arms referred to.) This lever H bears at its lower end a gear composed of a few teeth or cogs and in the shape of the segment of a circle of small diameter, which segmental gear locks in and works with a similar segmental gear on the projecting left-hand end of the lower-blade bar, J. (See Fig. 1.) The construction of this segmental gear (as intimated in the second paragraph of this specification) is peculiar. The ordinary mode of making these segmental gears is with square-topped teeth or cogs. These square corners, if used herein, impinging on the sides of the opposing cogs, would grind and cut into them, while, the tops of the moving cogs, being cut parallel to an arc of the segment, not touching the opposing cogs, there is in action of the tool an intermission of the partially-rotatory motion, from which results irregularity of the tool's action; but my segmental gear, as seen in Fig. 4, gives a constant unvarying touching of not only the tops and sides of the two rows of cogs, but constant contact of the tops of one row of cogs with the opposing interspaces of the other row. The result is absolute regularity of action—most desirable where the motion is necessarily slow (comparatively) and against powerful opposition. The lever and the upper blade thus move unimpeded with a perfectly-regular motion, to the great facilitation of the action of the tool. This mode of making the cogs is not new with me, but is entirely new in this most advantageous application.

M is a piece of wire fastened to and projecting upward from the flat plate C, and bears a strip of metal, P, called the "gage-strip," which is kept in place at its loose end by a piece of wire, N, held similarly to the wire M.

Operation: The lever H H, as seen in Fig. 1, is turned up and compactly out of the way, being not at the moment in use. To work the device, the piece of iron is placed, as may be desired, on the lower blade, K, of the shears, the gage-strip P being used to assist in locating the iron properly. The lever H H is then brought by the hand toward the left, the two segmental gears, with fulcrum at G, forming a lever. The upper blade, L, is thus brought down upon the iron, and the two blades being kept in close juxtaposition by the straggling arms of the upper-blade bar and the left-hand end of the lower-blade bar, the pressure by means of the lever continuing, the iron is cut off as may be desired.

I claim—

1. The combination and arrangement of the standard-plate, the lever, and the lower-blade bar with the upper-blade bar divided into two arms at its left-hand end, said arms passing, respectively, on each side of a projection from the lower-blade bar and the standard-plate, all constructed and arranged substantially as shown and described.

2. The combination and arrangement of the two blade-bars with their respective blades, and the standard or supporting plate, and the working-lever provided with segmental gear carrying round-top cogs, and the corresponding segmental gear on the lower-blade bar, all constructed and arranged substantially as shown and described.

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Witnesses:

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