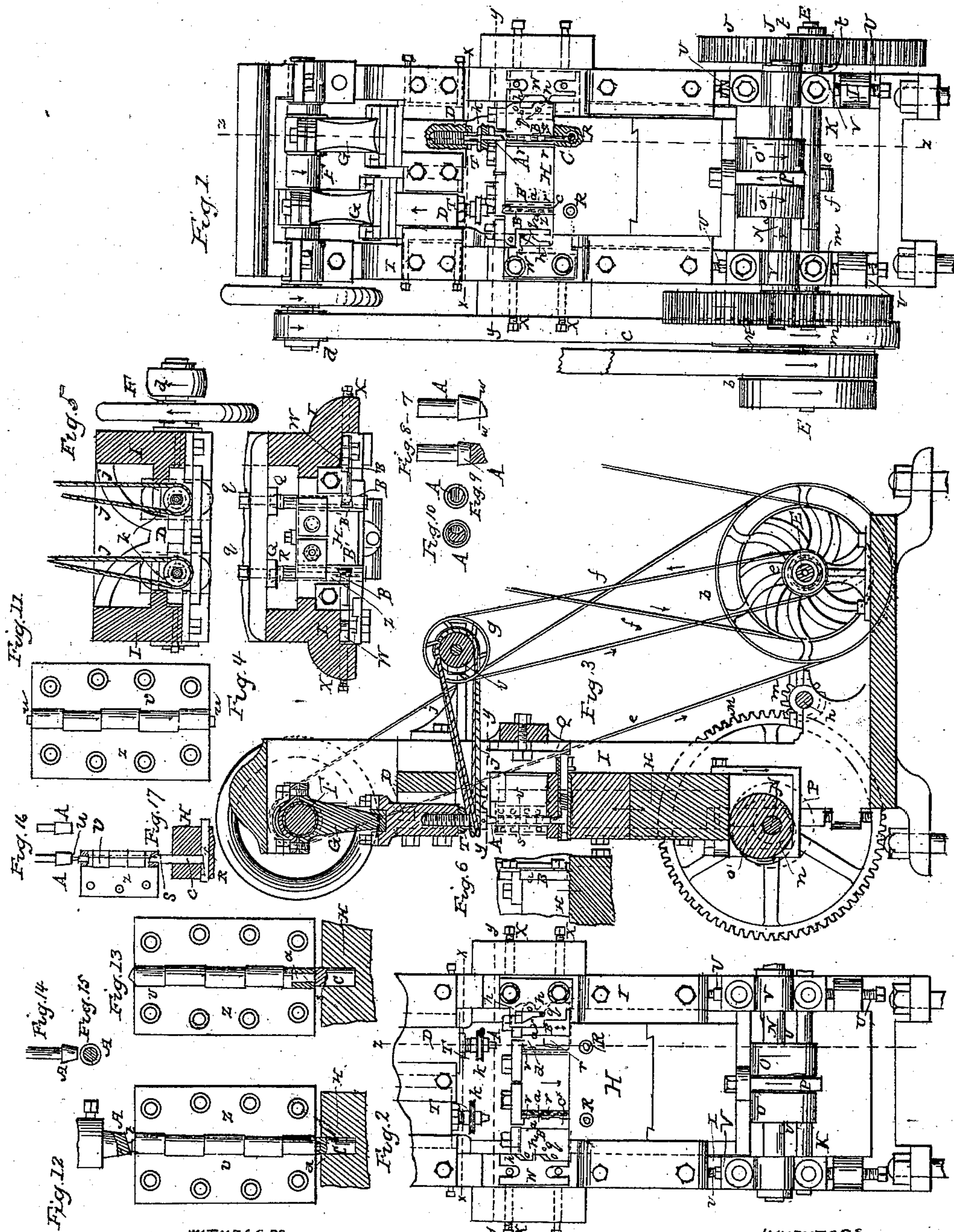


VALANCE & LITTELJOHN.

Riveting Hinges.

No. 33,174.

Patented Aug. 27. 1861.



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ISAAC W. VALANCE, OF LANSINGBURG, AND HIRAM LITTELJOHN, OF TROY,
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IMPROVED MACHINE FOR RIVETING HINGES.

Specification forming part of Letters Patent No. 33,174, dated August 27, 1861.

To all whom it may concern:

Be it known that we, ISAAC W. VALANCE, of Lansingburg, in the county of Rensselaer and State of New York, and HIRAM LITTELJOHN, of the city of Troy, in the said county and State, have jointly invented a new and useful Improved Machine for Riveting the Pivot-Wires in Butts and other Hinges, which invention we have assigned to the said ISAAC W. VALANCE and GEORGE W. VALANCE, of the said city of Troy; and we do hereby declare that the following is a full and exact description of our said improved machine and invention, reference being had to the annexed drawings, which make a part of this specification, and in which—

Figure 1 is a front elevation of one of our improved machines made double and represented in the act of hammering a rivet-head on one end of the pivot-wire of each of two butts, which in that figure are shown in red lines and clamped fast by the machine, some parts of the latter being removed and others shown in section to more clearly represent the construction. Fig. 2 is also a front elevation of a portion of the same machine, the hinge-clamping devices being shown open without any hinges therein and in a position and condition to receive the hinges. Fig. 3 is a vertical section at and elevation of some parts on the left-hand side of the line *z z* in Figs. 1 and 2. Fig. 4 is a horizontal section at and plan of some parts below the line *y y* in Figs. 1, 2, and 3. Fig. 5 is a horizontal section at and plan of some parts (shown inverted) above the line *x x* in Fig. 1. Fig. 6 is an inside elevation of a part of the hinge-holding device of the same machine. Fig. 7 is a side elevation, Fig. 8 a side view and partial central longitudinal section, Fig. 9 an end view, and Fig. 10 a cross-section at the line *w w* in Fig. 7, of a riveting-punch or peening-hammer which may be used successfully in our improved machine to strike in different places around and directly against the end of the pivot-wire so as to form a rivet-head thereon outside of the end of the knuckles of the hinge, as indicated by Figs. 11, 12, and 13; and Fig. 14 is a side elevation, and Fig. 15 an end view, of another punch or hammer; and Fig. 16, a side view of still another punch or peen, either of which

may be successfully used in our said improved machine to rivet the ends of the pivot-wires into countersunk recesses in the ends of the hinge, as indicated by Fig. 17.

Like parts are marked by the same letters in all the figures, and the arrows therein indicate the directions in which the parts move.

The double machine shown by Figs. 1, 2, 3, 4, 5, and 6 is constructed as follows, to wit:

A A are the two riveting-hammers, each of which has a rotary motion and also a reciprocating movement substantially in the direction of its axis of revolution.

Each hinge-holder consists of a movable jaw B, a fixed jaw B', and a pivot-wire support C. The faces *a a'* of each pair of jaws B B' are shaped and arranged so as to hold a hinge Z by its knuckles *v*, Figs. 4, 2, 6, and 1. Each movable jaw B can be moved from and toward its fixed mate B', so as to receive, grip, and release the hinge. Each hinge-holder is so arranged with its own riveting-hammer that the axis of the pivot-wire *u* of a hinge when held by the hinge-holder shall be substantially in line with the axis of revolution and the direction of vibration of the riveting-hammer, and each hinge-holder is also movable toward and from its riveting-hammer in substantially the same direction as that in which the latter is reciprocated. The reciprocating movement of each riveting-hammer toward its hinge-holder and of each hinge-holder toward its riveting-hammer is so limited in extent that when the hinge-holder is nearest to the riveting-hammer the latter will then just strike against and so rivet down the nearest end of the pivot-wire of a hinge held by the hinge-holder. In each riveting-hammer A A the part which strikes against the end of the pivot-wire of the hinge is so small and so shaped and arranged that it can strike against and thereby rivet down only a part of an end of the pivot-wire at each blow, and each hammer is vibrated so rapidly and turned either constantly or between its blows, and each hinge-holder retains the hinge so long a time in the position where the hammer A can strike the pivot-wire that the riveting-hammer will then strike one, two, three, or more series or circuits of blows on the end of the pivot-wire, and thereby form a complete rivet-head.

When the hinge-holders are opened, they are then so far from the hammers that the latter cannot strike the hinges in the hinge-holders, and are opened so wide and during so long a time as, first, to allow the riveted hinges to fall out of or to be removed by hand from the hinge-holders, and, second, to permit the person in attendance to afterward place other hinges in the hinge-holders before the latter are closed again.

Each revolving hammer or riveting punch A A is secured in a sliding stock D, Figs. 1, 2, and 3, which receives the reciprocating movement toward and from the hinge-holder from a main driving-shaft E by means of the pulley *b*, belt *c*, pulley *d*, double-crank shaft F, and connecting-rod or pitman G, and each riveting-hammer also receives its rotary motion from the shaft E by means of the pulley *e*, belt *f*, pulley *g*, shaft *h*, pulley *i*, belt *j*, and pulley *k*, as indicated by the annexed drawings.

The two hinge-holders are mounted upon and carried by a stock H, which is slid on ways in the fixed frame I toward and from the riveting-peens A A by means of a pinion *l*, Fig. 1, fast on the shaft E and gearing with a spur-wheel J, fast on the shaft K, the pinion *m*, fast on the shaft K, and engaged with the wheel M, fast on the shaft N, which turns the cams O O', which shove the stock H toward the riveting-hammers, and also turns the cam *n*, (shown by dotted lines in Fig. 3,) which presses against the inner side of the loop P, and thereby presses the stock H, with its hinge-holders, away from the riveting-hammers.

The movable jaw B of each hinge-holder is slid toward its fixed mate B' and held so as to clamp a hinge by reason of the movement of the hinge-holders toward the riveting-hammers and while the hinge-holders are in the position where the hammers A A can strike the pivot-wires of the hinges in the hinge-holders by means of cam-shaped projections *o o*, Figs. 1 and 2, on each jaw B, and corresponding fixed projections *p p p p* on the frame I of the machine, and the hinge-holders are opened so as to release the riveted hinges and allow others to be inserted by the movement of the hinge-holders away from the riveting-hammers by means of a projection *q*, Figs. 1 and 2, on each movable jaw and the fixed guides *r r*.

In order to lessen the liability of too great strain upon the machinery and of bending the pivot-wires in heading them by the substantially positive or irresistible blows of the riveting-hammers when operated by a crank and pitman, as above described, the cams O O', Figs. 3, 2, and 1, are so shaped and arranged that the cam or part O will first move the hinge-holders so that the riveting-hammers will, by a circuit of blows, batter down only a part of that portion of the pivot-wire which is to be made into the rivet-head, and so that the cam O' will next move the hinge-

holders nearer to the riveting-hammer, so that the latter will then, by a succeeding circuit or circuit of blows, rivet down the remainder of the rivet-heads; but it is not always necessary to thus gradually present the hinges to the action of the riveting-hammers.

Sometimes the first rivet-head that is made on the pivot-wire by the above-described machine is left at a little distance from the end of the knuckles of the hinge, as shown at *t* in Fig. 12, and in order to render it more certain that both rivet-heads will be left close against the ends of the knuckles the pivot-wire support C, Figs. 3, 1, and 17, is moved in the stock H toward the riveting-hammer A just after the hinge is clamped by the hinge-holder, so as to slide the pivot-wire, which then rests on the stop *c* endwise within the hinge while clamped by the jaws B B', and thereby force the rivet-head first formed on the pivot-wire close against the end of the knuckles of the hinge, as shown at *s* in Figs. 13 and 17, before the riveting-hammer A shall rivet down the other end of the pivot-wire. The movement of the support C is effected by reason of the movements of its carrying-stock H by means of the fixed guide Q, Fig. 3, and the sliding wedge R, provided with a return-spring S; but, as indicated by Figs. 12 and 13, it is not always necessary to thus move the pivot-wire support C.

In order that the machine may be conveniently altered to rivet hinges having knuckles of different lengths and thicknesses, each peening-hammer A is adjustable in its stock D in the direction in which the hammer is reciprocated by means of a screw-stock T and nut T', Figs. 1 and 3, and the hinge-holders are made to move back and forth at a greater or a less distance from the riveting-hammers by means of set-screws U U U U, Figs. 1 and 2, pressing against the journal-boxes V V of the cam-shaft N, which reciprocates the hinge-holders, and each pivot-wire support C can be readily pulled out of its socket and another of a different length put in its place, and the face part *a'* of each fixed jaw B' of the hinge-holders can be easily changed for another having a knuckle-groove of different size, and the fixed guides W W, Figs. 1 and 2, are adjustable by means of set-screws X X X X, so that the guides will force the jaws B nearer or not so near to their mates B', and the guide Q is adjusted by a clamp-screw *q'*, so as to give more or less movement to the pivot-wire support C and to conform to the variable positions of the stock H; but other devices equivalent to those just mentioned may be employed to adapt the machine for riveting different sizes of hinges, and these adjustments themselves may be dispensed with in machines designed for riveting only one size of hinge.

The jaws B B' are shaped to hold the hinges either when the latter are open, as shown in Figs. 3, 4, 11, 12, and 13, or when closed, as shown in Fig. 17; but we generally prefer to

have the hinges closed, for then the weight of the flaps is all on one side and causes the hinge to fall out of the hinge-holder upon opening the latter. The jaws B B' are either made so as to grip all the knuckles of a hinge, or with projections $r' r' r'$, so as to grip only the knuckles of the flap, which has the knuckles at the ends of the hinge. The striking-faces of the riveting-hammers may of course require to be varied in shape, according to the shape of the rivet-head to be made thereby, and may be of any suitable form that will not strike against the whole of the end of the pivot-wire at each blow.

The machine may have but one riveting-hammer and one hinge-holder arranged and operated substantially as above described, instead of having two sets of those parts, as shown in the annexed drawings, and instead of giving the reciprocating movement to the hinge-holder and the rotary and reciprocating motion to the riveting-hammer from one and the same prime mover by means of the particular devices hereinbefore mentioned for those purposes they may be effected by means of other suitable or equivalent mechanical contrivances, and other devices, equivalents for those above described, may be employed to close and open the hinge-holders and to move the wire-support C, and the machine still embody the distinguishing features or parts hereinafter claimed as of our invention.

The reciprocating riveting-hammers might be carried into and out of action upon the pivot-wires of hinges in the hinge-holders by making the stock H with its hinge-holders stationary and moving the riveting-hammers with their reciprocating apparatus toward and from the hinge-holders, and the hinge-holder might be revolved instead of the riveting-hammer to make the circuit of blows on the pivot-wire; but we deem such constructions inferior to the machine shown by the annexed drawings.

We are aware that in riveting-machines heretofore made there has been employed a revolving and reciprocating peen or hammer having its striking-face smaller than the face of the rivet-head made thereby, and forming the rivet-head by a succession of blows around the circle, an example being shown in United States Patent No. 20,685, A. D. 1858; but we do not know or believe that in any such machine a movable hinge-clamp was ever before so arranged with the riveting-hammer that a person attending the machine could thereby insert and firmly clamp the hinge and accurately present it for the action of the riveting-hammer while the riveting-hammer was constantly revolving and reciprocated at its full working speed without any interference from the vibrating hammer, substantially as would be the case in the machine shown by

the annexed drawings if the hinge-holders were not reciprocated and closed and opened by the same motive power that drives the riveting-hammers, but were thus operated by the manual power of the person attending the machine, and by which mode of operation hinges can indeed be riveted in our machine with much profit and dispatch. Neither do we know or believe that in any riveting-machine heretofore made a reciprocating riveting-peon and a hinge-holder have been so constructed and arranged together and operated in combination, that the machine will automatically admit, grip, and securely hold a hinge and strike a series of blows in succession in a circle and in different places upon and around the end of the pivot-wire of the hinge, and finally release the hinge so riveted, all substantially as herein described and shown by the annexed drawings. Nor are we aware that a movable support C for the pivot-wire of the hinge while being riveted was ever before operated in combination with jaws for clamping a hinge by its knuckles, substantially in the manner hereinbefore set forth.

What we claim as new and of our invention in machines for riveting hinges, and desire to have secured by Letters Patent to the said ISAAC W. VALANCE and GEORGE W. VALANCE, as the assignees of our whole right and title thereto, is—

1. The herein-described arrangement of a riveting peen or hammer, shaped, revolved, and reciprocated a uniformly limited distance, substantially as herein described, with a hinge-holder constructed substantially as herein set forth and having a certain limited movement toward and from the riveting-peon, whereby the operator can freely and accurately present the hinges to the riveting-peon while the latter is revolving and reciprocating at its full working speed, as herein specified.

2. The combination of a reciprocating riveting-hammer and a hinge-clamp, so constructed and operated together, substantially as herein described, as to automatically admit, grip, and hold a hinge and strike a series of blows in a circle in different places upon the end of the pivot-wire of the hinge, and finally release the riveted hinge, as herein set forth, the combination as a whole being substantially such as herein specified.

3. The movable pivot-wire support C, Fig. 3, when arranged and operated in combination with the jaws B B' of the hinge-holder, substantially as and for the purpose herein described.

ISAAC W. VALANCE.
HIRAM LITTELJOHN.

Witnesses:

THOS. GOLDSMITH,
AUSTIN F. PARK.