

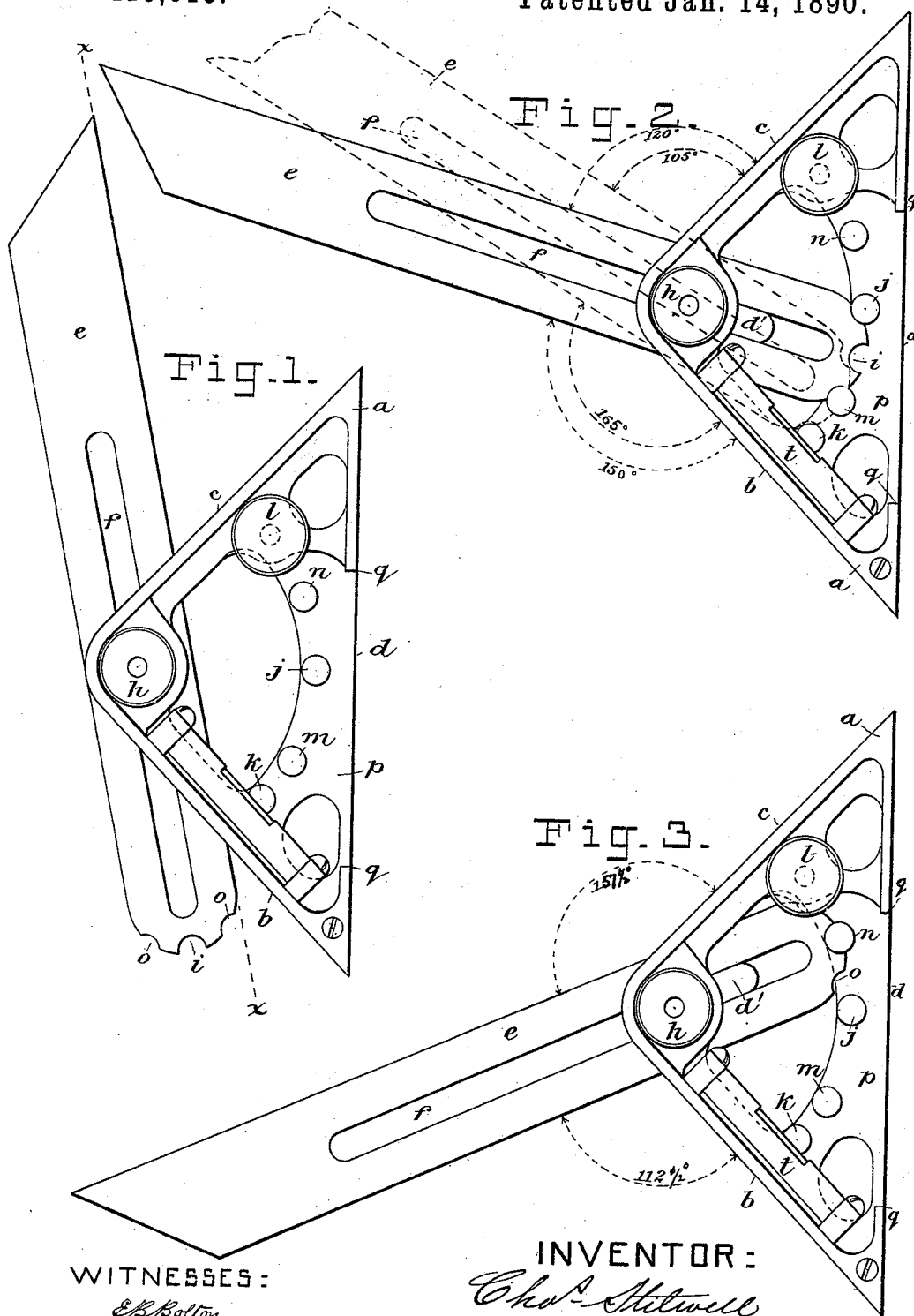
(No Model.)

3 Sheets—Sheet 1.

C. STILWELL.
ADJUSTABLE BEVEL SQUARE.

No. 419,615.

Patented Jan. 14, 1890.



WITNESSES:

E. B. Bolton
W. J. Morgan

INVENTOR:

Chas. Stilwell
By *A. P. Thayer*

his Attorney.

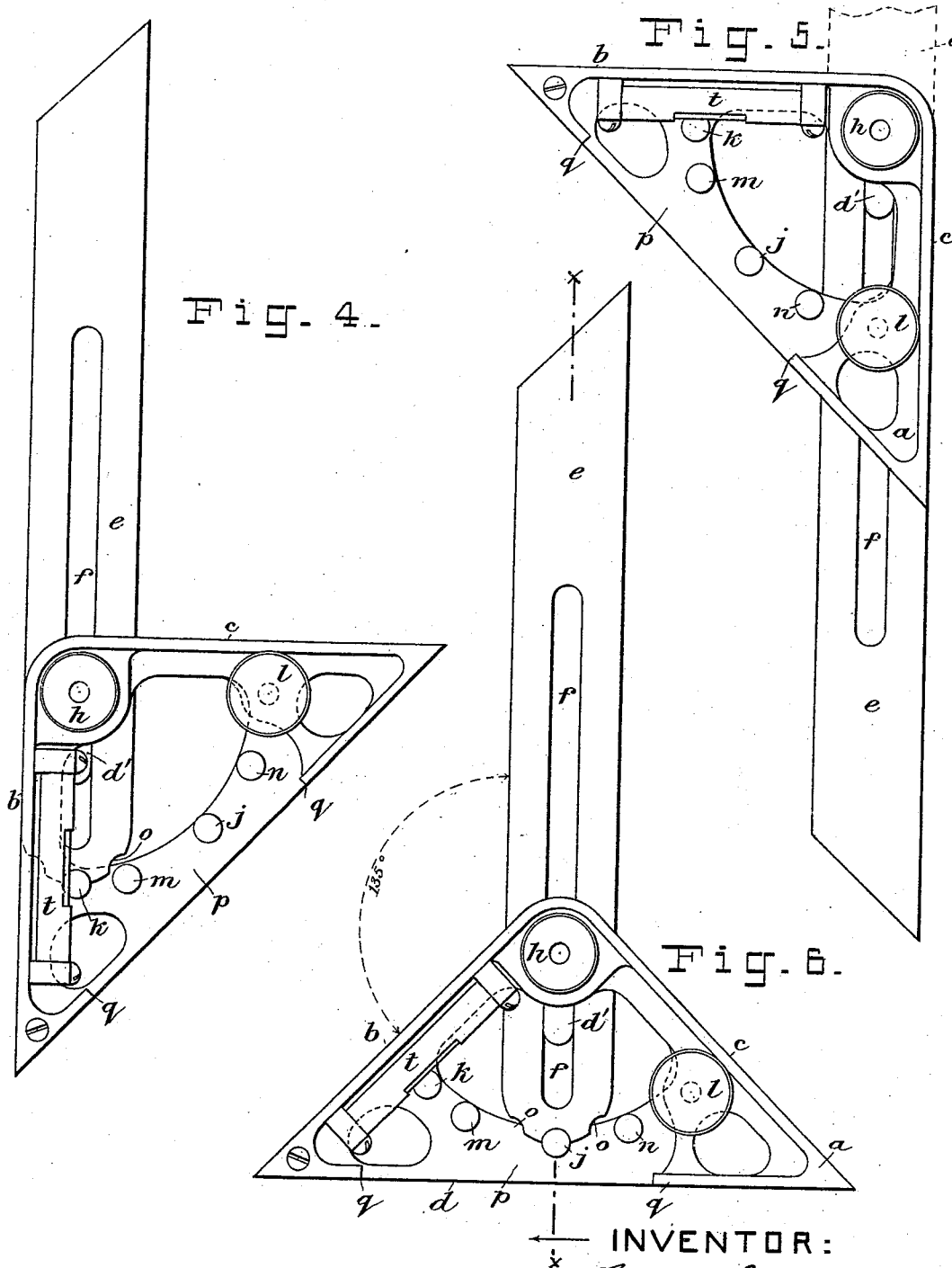
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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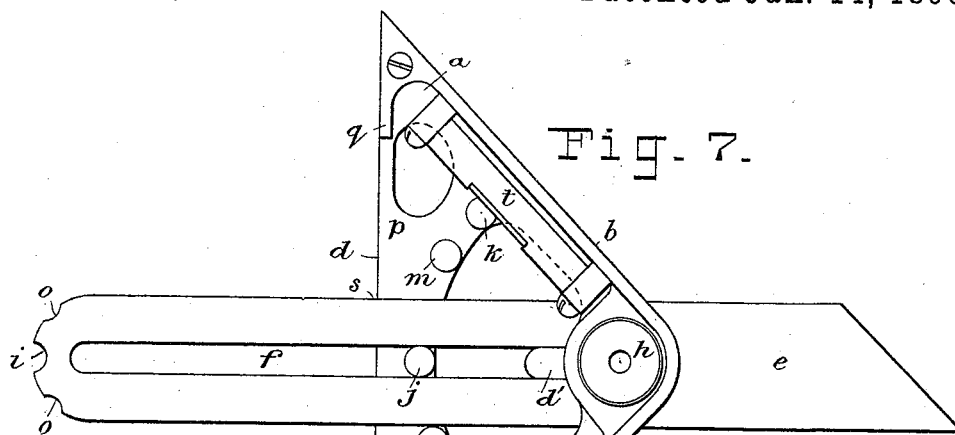


Fig. 7.

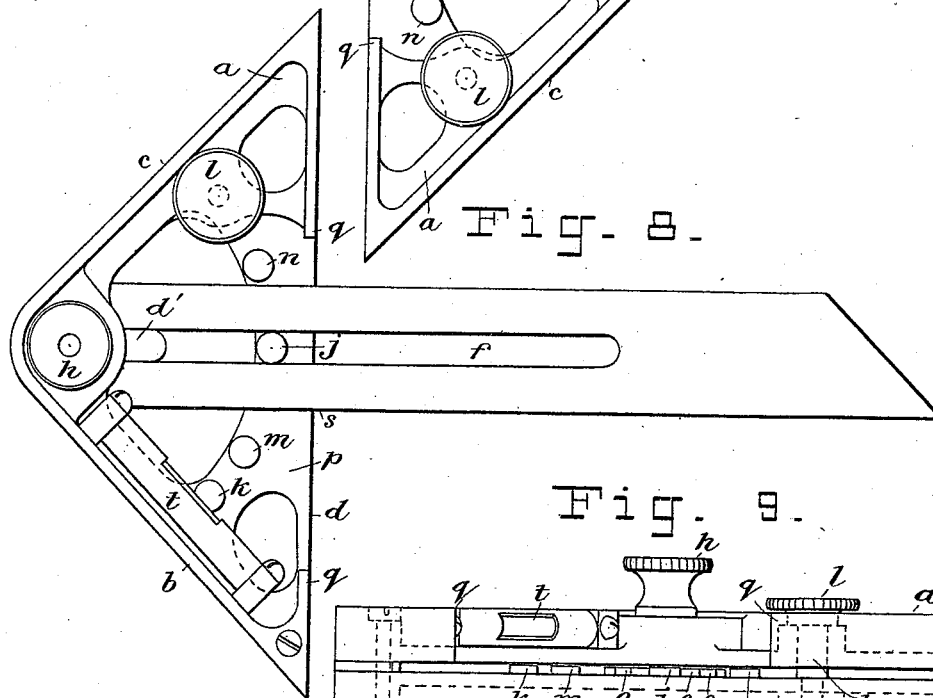


Fig. 9.

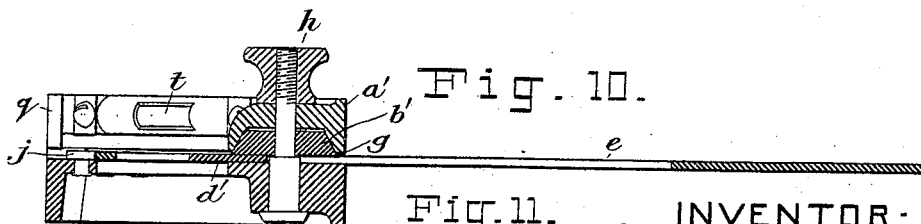
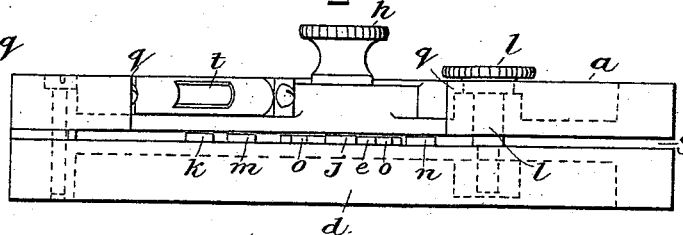
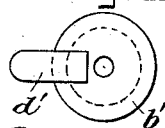


Fig. 10.

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UNITED STATES PATENT OFFICE.

CHARLES STILWELL, OF MORRISTOWN, NEW JERSEY.

ADJUSTABLE BEVEL-SQUARE.

SPECIFICATION forming part of Letters Patent No. 419,615, dated January 14, 1890.

Application filed July 11, 1889. Serial No. 317,237. (No model.)

To all whom it may concern:

Be it known that I, CHARLES STILWELL, a citizen of the United States, residing at Morristown, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in Bevel-Squares; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists of an adjustable triangular-headed bevel, try, and T square and spirit-level provided with adjusting devices for laying out different angles and for facilitating the use of the instrument for a plumb and level and as a radial square for laying out radial lines on a circular object, herein-after described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved bevel-square with the blade adjusted as for laying out both ends of a brace whose angular position is other than forty-five degrees, and therefore has different angles of the respective ends. Fig. 2 is a side elevation of the tool adjusted for certain lines of a hexagonal figure, and with dotted lines indicating another position for the blade. Fig. 3 is a side elevation of the same adjusted for certain lines of an octagonal figure. Fig. 4 represents the tool as a level and a try-square. Fig. 5 represents the tool as a plumb and an inside square, with dotted lines indicating another position of the blade. Fig. 6 shows the tool as a miter-square. Figs. 7 and 8 represent the tool as a T-square and a center-square. Fig. 9 represents an elevation of the base of the instrument. Fig. 10 is a sectional elevation of the tool on line *x x*, Fig. 6; and Fig. 11 is a detail of the blade binding and controlling device in plan view.

The instrument consists, essentially, of the triangular head-piece *a*, whose sides *b c* are forty-five degrees to the base *d* and ninety degrees to each other, and the thin metallic blade *e*, said blade having a slot *f* extending nearly its whole length along the middle, and being adjustably secured by the binding-screw *h* in the slot *g*, almost entirely separating the head-piece *a* into two parts, the

blade and the screw being so fitted that the blade may be shifted along and turned freely on the binding-screw when it is slack and be firmly secured in position when adjusted to the required position by screwing the binding-screw up tight. This allows the setting and securing of the blade to any desired angle to the sides *b c* for a bevel, as in Fig. 1; also for a miter-square, as in Fig. 6, and also for various other adjustments, of which several others are represented in the different views. This binding-screw is located in the line of the apex of the two sides of the head-piece perpendicular to the base, and its distance from the two sides *b c* at right angles to them is half the breadth of the blade, so that when the blade is turned to the parallel position with either side one edge forms an extension of the line of said side, as shown in Figs. 4 and 5. In one end of the blade is a notch *i*, coincident with the axial line of the slot *f*, and at *j* is a gage-stud coincident with binding-screw *h* in the line from the apex perpendicular to the base of the head-piece, and at *k l* are other gage-studs in the same line with said binding-screw *h*, in lines parallel to the sides *b c*, respectively. *l* is made in the form of a binding-screw to connect and hold the two parts of the stock together on that side, and at the same time to be removable to allow of shifting the blade around on pivot *h* to the position represented in Fig. 8. It will be seen that by setting the notch *i* on these studs respectively before tightening up the binding-screw controlling the blade by the slot the blade is accurately secured in the respective positions, Figs. 4, 5, and 6, without trouble or care and in accurate alignment. In Fig. 5, however, the screw-stud *l* is represented as inserted through the slot of the blade, the blade being shifted along binding-screw *h* to the limit permitted by the slot; but of course the notch *i* can be set to said stud *l*, the blade *e* being turned the other way, same as it is connected with studs *j* and *k*, Figs. 4 and 6, when it may be required. As in Fig. 5, the tool forms a corner-square, and is also useful as a plumb; but for the latter purpose it is better with the blade reversed. Then, however, the tool becomes a try-square instead of a corner-square. I make the stud *j* only about the height of the thickness of

the blade and fit the blade sufficiently slack in the head-piece that the blade may be sprung over and shifted along the stud for entering the stud in the slot to gage the blade for the try-square and T-square, and also for a radial or center square, as represented in Figs. 7 and 8. At *m* is another stud in such position relatively to binding-screw *h* and the head-piece that when the notched end of the blade is adjusted thereon, as indicated in dotted lines, Fig. 2, the tool serves for laying out the angles of one hundred and five degrees and one hundred and sixty-five degrees to the sides *c* and *b* of the head-piece, respectively, and at *n* is another gage-stud, whereon the blade is adjusted to one hundred and fifty-seven and one-half degrees to the side *c* and one hundred and twelve and one-half degrees to side *b*, as in Fig. 3. This is useful in laying out octagonal figures. The blade is made with other notches *o* of the notched end, one each side of notch *i*, which, being inserted between gage-studs *j* and *m*, as in Fig. 2, fixes the blade in the angles of one hundred and twenty degrees and one hundred and fifty degrees to said sides *c* *b*, respectively, for hexagons.

At *p* there is a part removed from the base *d* in one side of the head-piece, at the extremities of which are bearing-points *q* for the edges of a curved piece of work, as a round disk or wheel, said bearing-points being equidistant from the edge *s* of the blade when adjusted for a T-square, so that it will then serve to lay out radial lines on such a piece, the periphery of said piece being placed against the bearing-points *q*.

At *t* is a spirit-level applied so as to be used with side *b* of the head-piece as a base and with the blade *e* as an extension thereof for greater accuracy when adjusted on gage-stud *k* by its notched end, as in Fig. 4, and it is also adapted for use with said side *b* as a base and with side *c* for a plumb-line when said side *c* is extended by one edge of blade *e*, said blade then having its notched end adjusted on the gage-stud *l*, as indicated by the dotted lines, Fig. 5. The instrument is also useful in either of these conditions for a try-square. It will be seen that with these gage devices for special angles most frequently required and for prolongations of the sides of the head-piece the instrument has a greater range of usefulness than as heretofore made, and the contrivance for radially lining curved work is an important additional feature of usefulness.

An important advantage of the bevel having the blade pivoted near the apex of a right-angular head-piece and being adjustable along the pivot, so as to be used in one position with both sides of the head-block, is in the facility it affords of marking two different angles to a line, as *x x*, Fig. 1, and which are ninety degrees to each other, simply by placing the two sides of the head-piece, respectively, to said line, and without chang-

ing the blade in the head-piece, which is especially useful in laying out braces of framework which are not to be in angles of forty-five degrees.

For a substantial self-centering clamping-joint at the binding-screw *h*, I make a conical socket *a'* concentric with the hole for said screw in one of the parts of the head-piece and provide a correspondingly-shaped washer *b'*, rising slightly above the surface of said part when placed in said socket, and having a tongue-piece *d'* on the surface fitting the slot of the blade *e*, between which washer and the other part of the head-piece the blade is bound when screw *h* is made tight, which also binds the washer in the socket, so that its friction therein through the tongue *d'* affords powerful resistance to the turning of the blade in the head-piece without having to draw the screw very tight, and gives stability to the blade when secured in any position.

I claim as my invention—

1. The combination of the right-angled triangular head-piece having the median slot for the blade nearly separating it into two parts, the slotted blade pivoted together near the apex of the said angle, and the binding-screw *h*, by which they are pivoted together, said blade being adjustable around and along the pivot, substantially as described.

2. The combination of the triangular head-piece, slotted blade, and the binding-screw *h*, by which they are pivoted together, one or more gage-studs of the head-pieces, as *j m n*, and the notched end of the blade, substantially as described.

3. The combination of the triangular head-piece, the spirit-level arranged on the inner side of one of the sides of the head-piece, and the blade pivoted in the apex of the head-piece and adjustable to and securable in a fixed position, with one edge in alignment with the side of the head-piece forming the base of the level.

4. The combination of the right-angled triangular head-piece, the slotted blade having the notched end, and the binding-screw *h*, by which they are pivoted together near the apex of said angle, also the gage-stud *k*, said stud and the binding-screw *h* holding the blade with one edge in line with one side of the head-piece, and also the spirit-level located on said side of the head-piece as a base for the level, substantially as described.

5. The combination of the triangular head-piece, the slotted blade, the binding-screw *h*, by which they are pivoted together, the gage-studs *k l*, respectively, with stud *h* parallel to the respective sides of the head-piece and half the width of the blade therefrom, the notched end of said blade, and the spirit-level, substantially as described.

6. The combination of the triangular head-piece, the slotted blade, the binding-screw *h*, by which they are pivoted together, and the stud *j*, in the same line with the binding-

screw *h*, in a line perpendicular to base *d*, said blade being adjustable over the top of the stud to engage the stud in the slot and disengage it from the slot, substantially as described.

5 7. The combination of the triangular head-piece, slotted blade, and the binding-screw *h*, by which they are pivoted together, the gage-studs *j m*, and the notches *o* of the end of the blade, adapted to gage the blade to a predetermined angle by lodgment of said extension between said studs, substantially as described.

10 8. The combination of the triangular head-piece, slotted blade, the binding-screw *h*, by which they are pivoted together, the gage-stud *j*, in the same line with binding-screw *h*, in a line perpendicular to base *d*, and the bearing-points *q*, equidistant from the edge *s* of the blade, substantially as described.

15 20 9. The combination of the conical washer

with the blade, binding-screw, and the slotted triangular head-piece, one of the parts of said head-piece having a conical socket concentric with the binding-screw, substantially as described.

25 10. The combination of the conical washer and the tongue-piece thereon with the slotted blade, binding-screw, and slotted triangular head-piece, one of the parts of said head-piece having a conical socket concentric with the binding-screw, substantially as described.

30 In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 5th day of July, 1889.

CHARLES STILWELL.

Witnesses:

W. J. MORGAN,

W. B. EARLL.