

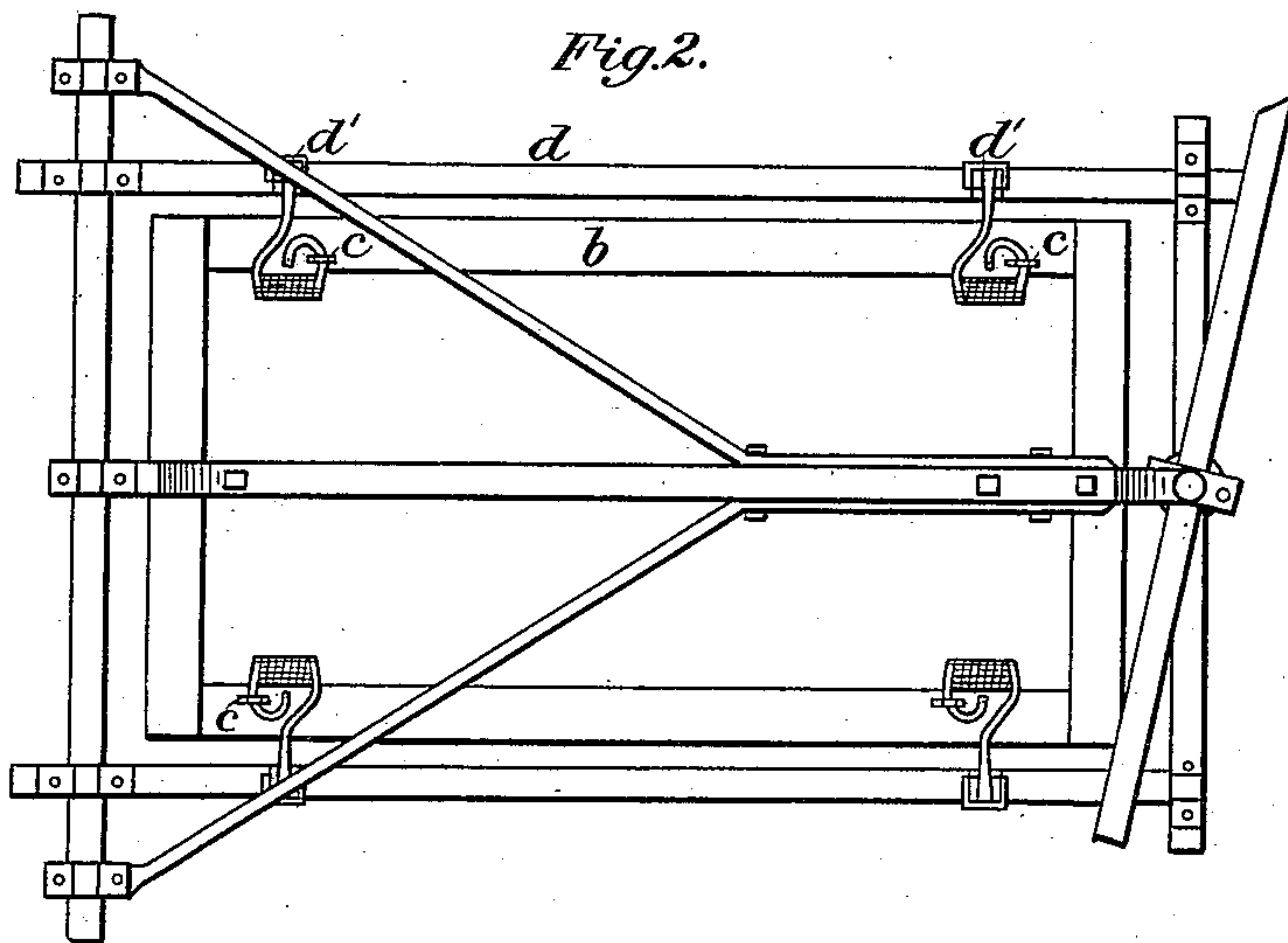
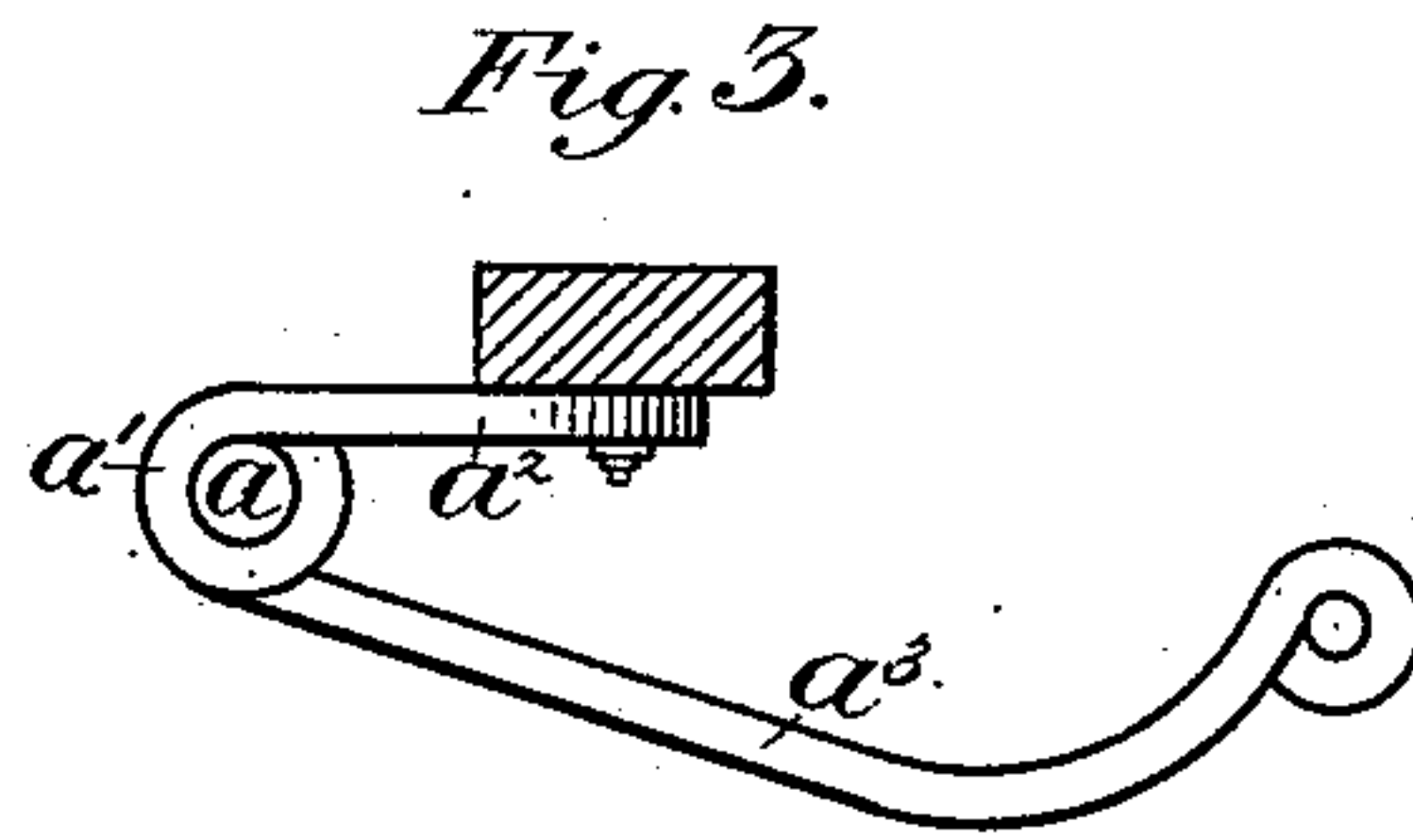
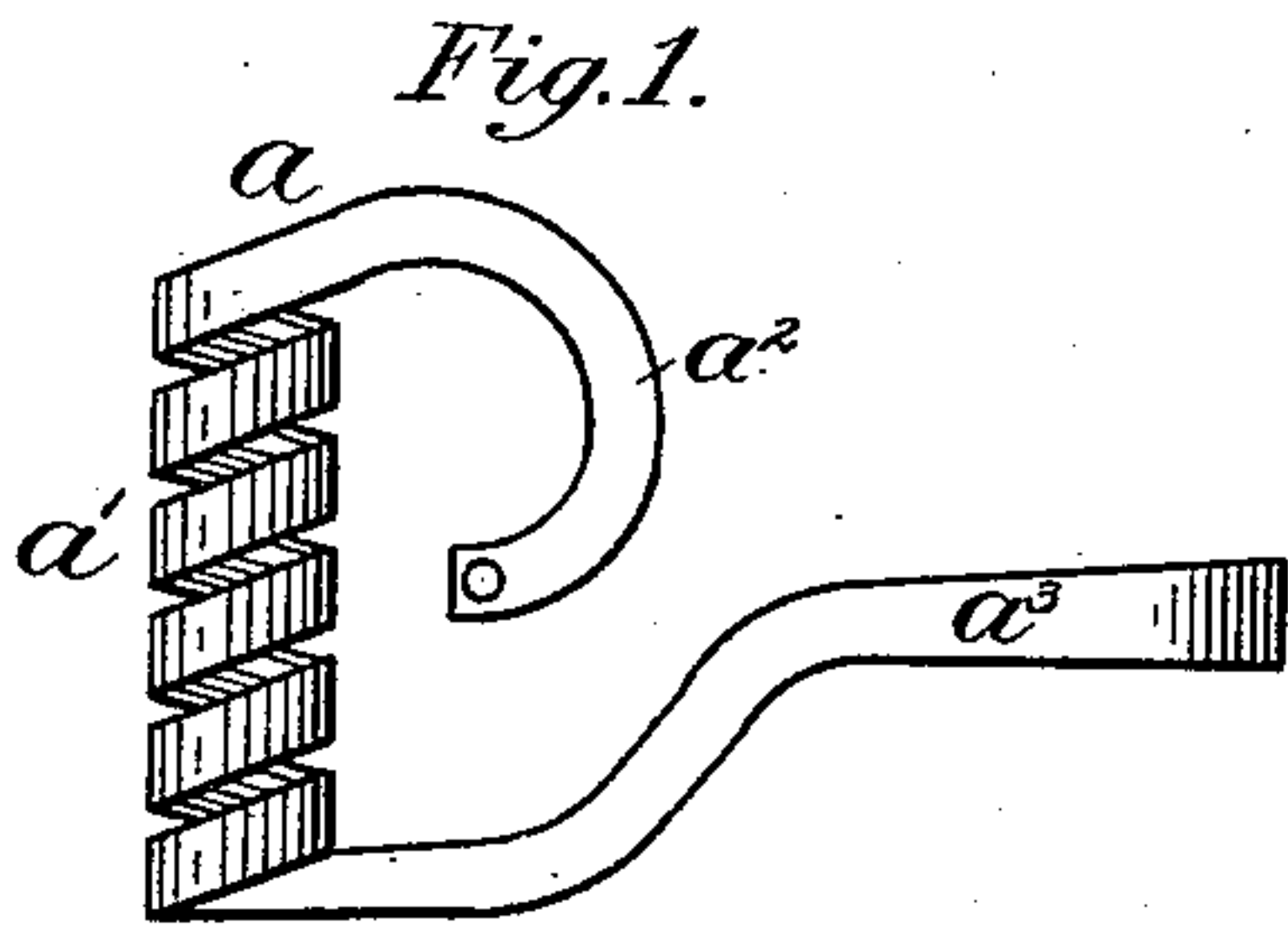
(No Model.)

W. W. GRIER.

VEHICLE SPRING.

No. 330,578.

Patented Nov. 17, 1885.



Witnesses

*W. J. Corwin*  
*H. L. Gill*

Inventor

*William W. Grier*  
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# UNITED STATES PATENT OFFICE.

WILLIAM W. GRIER, OF HULTON, PENNSYLVANIA.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 330,578, dated November 17, 1885.

Application filed April 30, 1885. Serial No. 163,934. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM W. GRIER, of Hulton, in the county of Allegheny and State of Pennsylvania, have invented a new and  
5 useful Improvement in Vehicle-Springs; and I do hereby declare the following to be a full, clear, and exact description thereof.

My improved vehicle-spring, while useful for other purposes, is especially adapted for  
10 use in the construction of the gears of side-bar vehicles, and is so illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the spring. Fig. 2 is a bottom view of the gear. Fig. 3 is a  
15 view illustrating the attachment of the spring.

Like letters of reference indicate like parts in each.

The spring  $a$  is formed of a single piece or bar of steel, of round, oval, square, or other  
20 shape in cross-section. It has a coil,  $a'$ , of any desired number of turns, formed in it at or near the middle. One end,  $a^2$ , which extends in a horizontal direction laterally from the coil, is preferably bent toward the other end,  
25 and extends, preferably, not beyond a point opposite to the middle of the coil. The other end,  $a^3$ , also extends from the same side of the coil, and is bent toward the other end, preferably not beyond the middle of the coil. In  
30 addition to this, it is curved downward. The end  $a^2$  affords a rest or support to the vehicle-body  $b$ , to which it is fastened by means of bolts or otherwise at the end, and by a strap or clip,  $c$ , near the end of the coil. The other  
35 end,  $a^3$ , is hung or fastened to the side bar,  $d$ , by a shackle or clip,  $d'$ . Four of these springs thus attached are used in each gear, being placed one at or near each corner. So constructed the gear has many advantages. The  
40 form of the spring and its manner of attachment to the body and side bar cause the jars and sudden movements of the vehicle to act longitudinally on the springs, and thereby prevent side-thrust on the side bar and re-

lieve it from strain. The bending of the ends 45 toward each other and their attachment near together cause the strains produced by the vibration of the body under its load to act in the same vertical plane, and thereby prevent the racking of the gear. By securing the  
50 springs only at the ends, as described, I obtain the elastic action of nearly the whole length of the bars of steel of which they are composed, and thereby secure an easy and luxurious motion to the body of the vehicle. 55

The spring itself is light, durable, neat, very elastic, cheap, simple in manufacture, and easy of attachment.

I am aware that a coiled spring having one arm attached to the side bar and the other to 60 the body of the vehicle in different vertical planes is not new, and I do not herein claim the same.

What I claim as my invention, and desire to secure by Letters Patent, is— 65

1. In a side-bar vehicle, the combination, with the body and side bar, of a spring having a coiled body and laterally-diverging torsion-arms, which curve inward and are secured by their extremities, the one to the side bar 70 and the other to the sill of the body, substantially as and for the purposes specified.

2. In a side-bar vehicle, the combination, with the body and side bar, of a spring having the coiled body  $a'$ , the horizontally-pro- 75 jecting inwardly-curved body-arm  $a^2$ , and the downwardly-projecting inwardly-curved side-bar arm  $a^3$ , said arms connected at or near their extremities to the bed and side bar, substantially as and for the purposes specified. 80

In testimony whereof I have hereunto set my hand this 18th day of September, A. D. 1884.

WILLIAM W. GRIER.

Witnesses:

W. B. CORWIN,  
THOMAS B. KERR.