

A. O. KITTREDGE & F. M. LEAVITT.

SQUARING SHEARS.

No. 345,639.

Patented July 13, 1886.

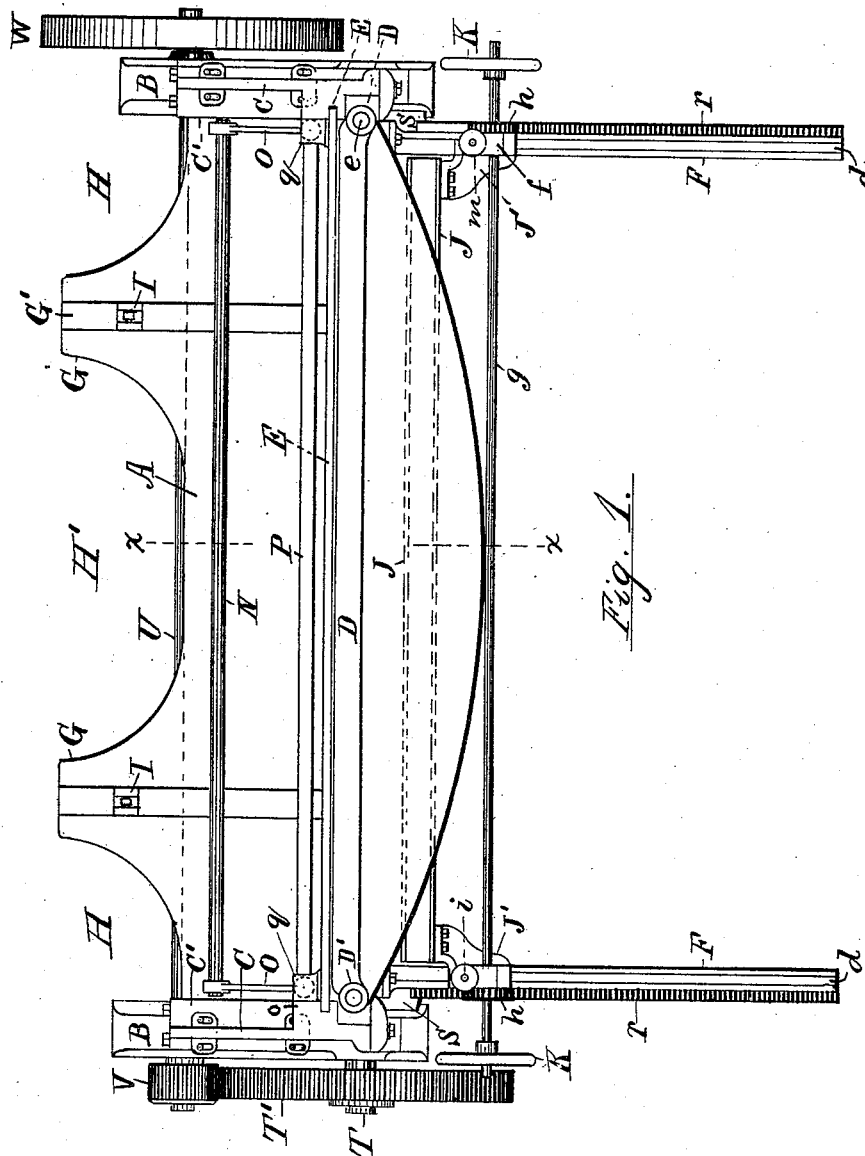


Fig. 1.

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Inventor.

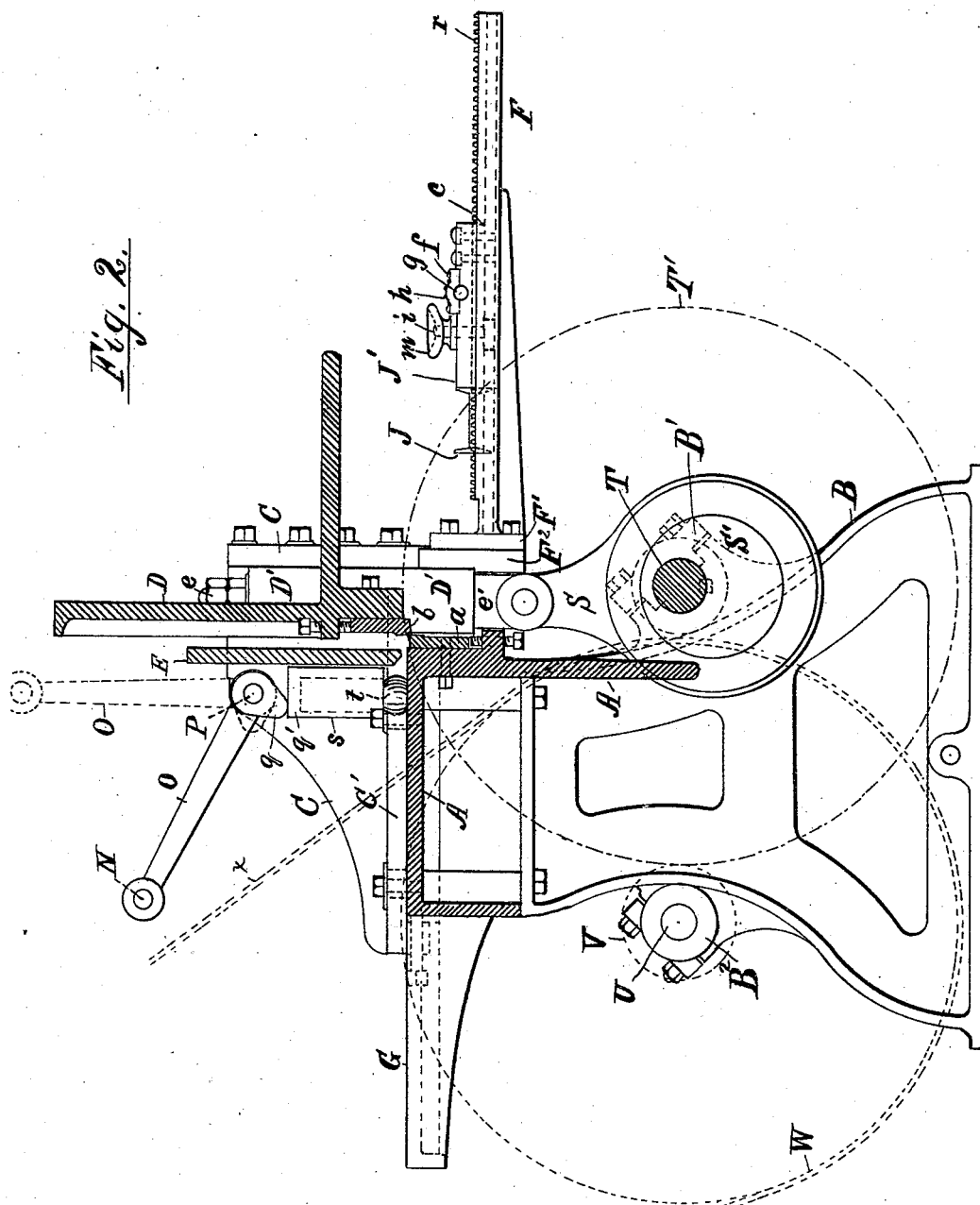
H. D. Bradshaw A. O. Kittredge & F. M. Leavitt,
Henry J. Shebeath, per Crane & Miller, attys.

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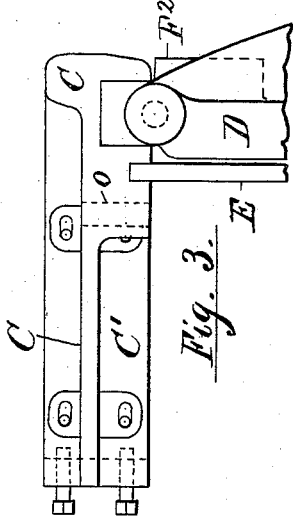


Fig. 3.



Fig. 8.

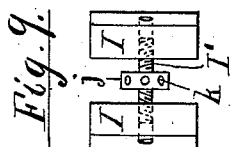


Fig. 9.

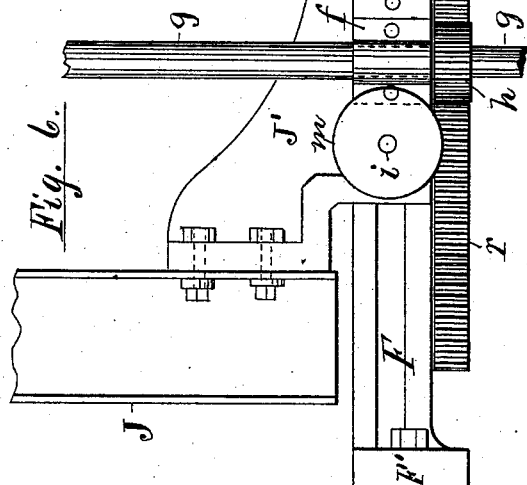


Fig. 6.

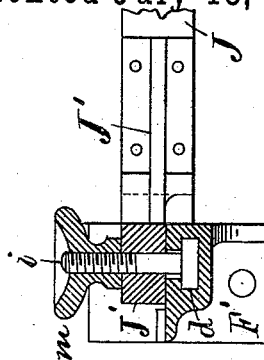


Fig. 7.

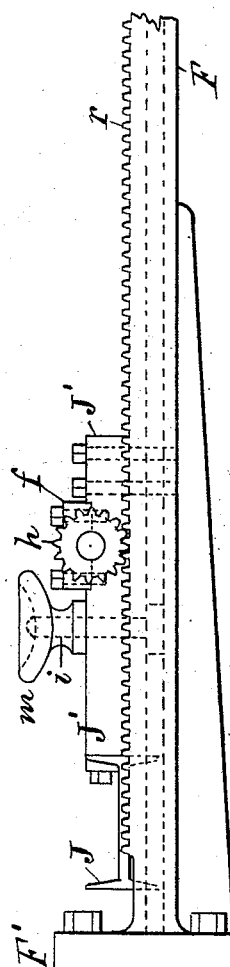


Fig. 5.

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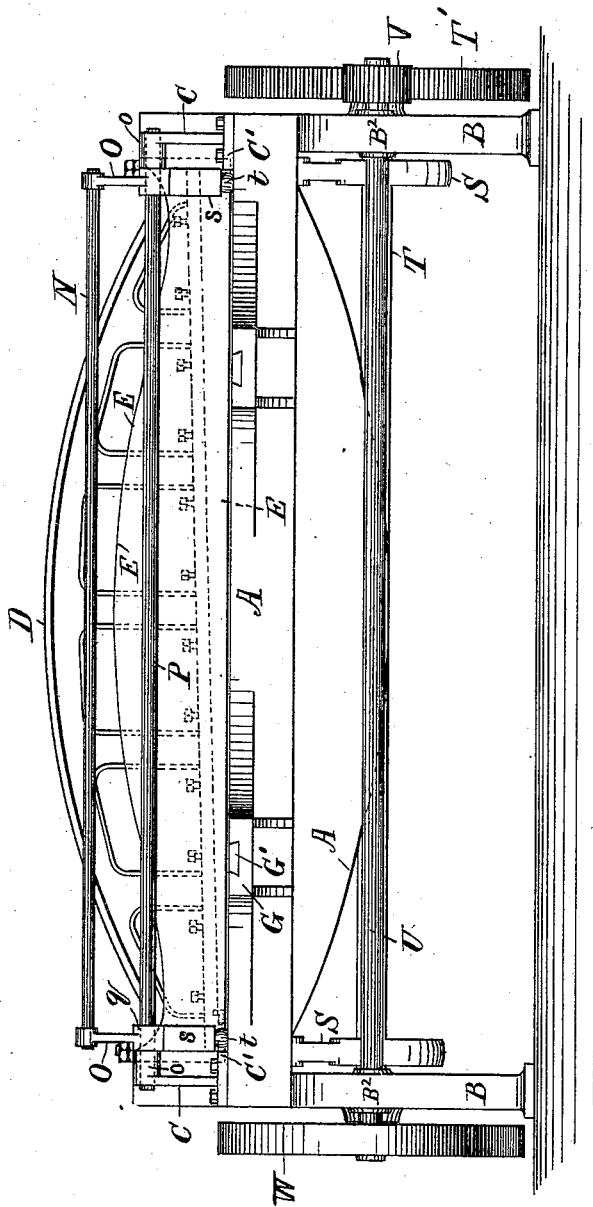
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Fig. 4.



Attest:

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UNITED STATES PATENT OFFICE.

ANSON O. KITTREDGE, OF SLATE HILL, AND FRANK M. LEAVITT, OF
BROOKLYN, NEW YORK.

SQUARING-SHEARS.

SPECIFICATION forming part of Letters Patent No. 345,639, dated July 13, 1886.

Application filed October 29, 1885. Serial No. 181,310. (No model.)

To all whom it may concern:

Be it known that we, ANSON O. KITTREDGE and FRANK M. LEAVITT, residing, respectively, at Slate Hill, in Orange county, New York, and at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Squaring-Shears, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention consists in certain attachments by which the machine is rendered more effective and more convenient for operation—namely, an improved construction and arrangement for the front gages, an improved means for moving the rear gage parallel with the blades or cutters, and an improved construction and arrangement for the lever-bar to actuate the clamp.

These improvements will be understood by reference to the annexed drawings, which represent a heavy-gear'd shear with a blade eight feet long, our improvements being chiefly adapted for use in such large tools.

Figure 1 represents the machine in plan with the gearing at the left-hand end. Fig. 2 is a central vertical section of the same on line *xx* in Fig. 1, with the outlines of the gears and pulley represented by dotted lines. Fig. 3 is a plan, upon a large scale, of one end of the movable cutter-beam and clamp with their bracket-guide. Fig. 4 is a rear view of the machine. Fig. 5 is a side view, Fig. 6 a plan, and Fig. 7 an end view, of the rear-gage attachments and one end of the gage-bar. Fig. 8 is an end view of one of the brackets for the front gage with the gage inserted, and Fig. 9 a plan of the gage detached from the bracket. Figs. 3, 5, 6, 7, and 9 are enlarged, to show the details of construction more clearly.

A is the bed of the machine; B, a leg at each end of the same.

C are bracket or standard guides, bolted by flanges on top of the bed, at opposite ends, to sustain the cutter-beam D and clamp E. The angle-bars C' are set exactly at right angles to the cutting-edge to serve as squaring-gages at each end of the bed. The movable cutter-beam is formed at each end with a vertical socket, D', in which is inserted a bolt, *e*, hav-

ing at its lower end a fork, *e'*, connected with an eccentric-strap, S, and an eccentric, S'. The eccentrics are rotated by a shaft, T, fitted to bearings B' upon the legs B, and provided at one end with a spur-gear, T'. A shaft, U, is fitted to bearings B² upon the opposite side of the legs, and drives the gear T' by means of a pinion, V, being itself rotated by a belt applied to a pulley, W.

a is the lower cutter, and *b* the upper cutter, affixed to the beam D, and the rear gage is so attached to the said beam that when it is raised for the insertion of the sheet metal the gage may be opposite to the rear edge of the table upon which such metal rests.

F F are slides bolted at F' to the cutter-beam D, which is provided with seats F², attached to the sockets D' and extended toward the front line of the guides C. The rear gage is carried by the slides F, and is thereby moved up and down with the cutter-beam D, as is common in such constructions.

J is the rear gage, formed of a wrought-iron beam attached at each end to a cast-iron head, J', which is provided with a tongue, *c*, to fit a T-slot, *d*, in the slide F. Each slide is provided with a rack, *r*, and the head is provided with bearings *f*, in which is fitted a cross-shaft, *g*, provided near each end with a pinion, *h*, fitted to the racks *r*. The shaft *g* is provided at each end with a hand-wheel, K, by means of which and of the pinions *h* the heads may be moved equally upon the slides F, so as to adjust the gage J to and from the cutters in positions parallel therewith. The heads are also provided with T-bolts *i* and hand-wheels *m*, by which the gage may be clamped at any distance from the cutting-edge.

H H H' are standing-spaces formed in the rear edge of the bed A by casting projections G G integral with the body of the bed, and extending from the front edge of the same to support the front gages; and one part of our invention consists in so disposing these projections that the operator may stand at either end of the bed, as well as in the middle, for the purpose of holding the sheet metal conveniently in contact with the gages C'. Each projection G is placed at a sufficient distance from the end of the bed to afford standing-room for the operator, as at H H in Fig. 1,

while the space H' between the brackets affords room for him to stand at the middle of the bed when applying long pieces of sheet metal to the gages I, without reference to the end gages formed by the bars C'. The gages I are peculiarly constructed, so as to fit dovetail grooves G', formed in the brackets, and extended from the front end of the same to the lower cutter. These gages are shown enlarged in Figs. 8 and 9, and consist each in two blocks, I, combined with a right-and-left-hand screw, I', having a head, j, in the center, with a hole, k, to admit a wrench-pin for turning the screw. The gage is constructed to extend but a short distance above the top surface of the bed A, as shown in Fig. 4, to avoid interference with the passage of the sheets into the machine, and is readily clamped in any part of the groove G' by inserting a pin in the hole k and slightly turning the screw I'. If desired, a pin may be secured in the hole and the gage fitted to the groove in such manner that when clamped therein the pin will be turned out of the way between the blocks; or any other means may be used for turning the screw. Such gages are used independently of the gage J, and by such construction the operator, standing at the edge of the table, as at H', is able to slip the pieces of sheet metal successively over the top of such gages, and to pull them back into contact therewith before clamping them to receive the cut.

It is obvious that the dovetail form for the groove G' is not essential, as the weight and the clamping pressure of the gages would hold them in a rectangular groove.

Our improvement in the clamping device consists in combining a handle-bar with a cam-shaft, P, extended all the way across the bed and fitted to the bearings on the brackets C, which form the guide for the clamp. The handle-bar N is connected to the shaft P by arms O O, and the shaft P is journaled at each end in bearings o o, formed in the upper part of each bracket C, adjacent to the clamp-beam E, and is shown in Fig. 2 as provided at each end with a cam, q, which operates upon a seat, q', projected from the front side of the clamp-beam. The seat is formed upon the top of the socket s, which is cast upon the front side of the clamp-beam, so as to move therewith, and the socket contains a rubber spring, t, adjusted to bear upon the top of the table A, and operating to lift the clamp from the table for the insertion of the sheet metal. A downward pressure upon any part of the bar N is transmitted to the arms O, and rotates the shaft P, with its attached cams q, thus operating to press down both ends of the clamp-beam simultaneously, and compressing the springs t in such operation. The cam in Fig. 2 is shown nearly in its lowest position, with the clamp almost pressed upon the table. The cam and the arm O are also shown in dotted lines in the same figure, to illustrate their inoperative position when the clamp is released from pressure and elevated by the action of the springs t.

By the rigid attachments of the arms O to the shaft P it is obvious that a pressure upon either arm serves to rotate the entire shaft and actuate both the attached cams, and the bar N is thus adapted to satisfactorily actuate the clamp at whatever point the operator may apply the pressure of his hand.

In operating the machine the operator lifts the bar N to open the clamp, and places the sheet metal beneath the clamp, and in contact with the requisite gage or gages. He then depresses the bar N, forces the clamp-beam down upon the sheet metal, and then actuates the belt mechanism required to rotate the pulley W and actuate the shaft T to move the cutter-beam D. Such belt mechanism may consist in a tightener to press a moving belt upon the pulley W at the pleasure of the operator, or a clutch may be applied to one of the shafts, T or U, to stop and start the same; but such devices are not shown herein, as they form no part of our invention.

We are well aware that it is common to bolt brackets to the rear edge of a narrow bed to support the gages at that side of the latter where the workman stands, and we do not therefore claim as new the combination of a bracket with the front edge of the bed; but in such previous constructions the bracket has required a groove continuous with that in the table to fit the front gages, and such grooves, being formed in the brackets by the process of casting, have seldom coincided accurately in size and shape with those in the bed, and the brackets have often been bolted to the bed in such manner that the joint in the groove was liable to obstruct the movement of the gages when shifting the latter.

The object of our invention has been to secure a construction affording all the advantages of a narrow bed, by which the workman can stand close to the clamp, and at the same time to secure a groove for the gage in continuous casting through the entire extent of its movement, and thus obtain the advantages which would result from the use of a bed as wide as the widest sheet of metal to be cut. To thus obtain the advantages of a wide and narrow bed we use for our bed a casting as wide as the widest sheet of metal to be cut, and form in the front edge of the same the three standing-spaces, to afford the workman equal facility of access at the middle and ends of the same. The projections G are therefore made integral with the bed and united thereto by large curved flanges, so that they are not liable to be bent or broken, as in the case of brackets bolted to the bed, and the construction secures a continuous groove for the gages I in the solid metal of the bed, by which we are able to plane the grooves out smoothly, so as to accurately fit the expanding gages shown herein. Our construction also differs from previous ones in the arrangement of the grooves for the gages much farther from the ends of the machine than in ordinary cases, so as to leave the desired standing-room out-

side of each, as at H. This part of our invention is especially applicable to such large machines as are used chiefly for slitting long and wide pieces of sheet metal, and sometimes for

5 squaring their ends, so that in the one case the operator is compelled to stand where he can apply the sheet to both of the gages I and at another time to stand at one of the spaces H, to apply the sheet metal to the gage-bar C'.

10 Having thus set forth the nature of our improvements, we claim the same in the following manner:

1. A squaring-shears constructed substantially as described, with a bed having a cutter applied to its rear edge, a rear gage adjustable to and from the same, continuous grooves formed in the top of the bed to receive two front gages, the bed being formed in one piece of suitable width to admit the widest

20 sheet of metal to be cut between the front gages and the cutter, a central standing-space, H', formed in the front edge of the bed between said grooves, and similar spaces, H, near the ends of said bed, the grooves being arranged in relation to the ends of the bed to permit the

25 operator to stand in the spaces H to apply the sheet metal to squaring-gages C', secured at the ends of the bed, substantially as herein set forth.

30 2. In a squaring-shears, the combination, with the groove G', formed in the surface of the table, of the gage I, constructed with two blocks and with the screw having a head be-

tween the blocks for a wrench or pin for expanding the same within the groove, the blocks 35 being projected above the surface of the table to engage the edge of the sheet metal, substantially as herein set forth.

3. In a squaring-shears, the combination, with the table, the cutter-beam, and the brackets C, having guides for the cutter-beam and clamp, of the clamp-beam fitted to guides in the bracket, as set forth, and provided with seats g', sockets s, and springs t, and the shaft P, journaled in bearings in the bracket C and 45 provided with the cams q, arms O O, and handle-bar N, the whole arranged and operated substantially as shown and described.

4. In a squaring-shears, the means for setting the rear gage, consisting in the slides F, 50 provided with longitudinal bolt-slots d and racks r, and the gage-bar provided at each end with a head, J', the latter having the clamping-bolts i and the shaft g, journaled thereon, and provided with pinions h, fitted to 55 the racks r, and with hand-wheels K, for turning the shaft, substantially as shown and described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing 60 witnesses.

ANSON O. KITTREDGE.
FRANK M. LEAVITT.

Witnesses:

WILLIAM F. SMITH,
THOS. S. CRANE.

Correction in Letters Patent No. 345,639.

It is hereby certified that Letters Patent No. 345,639, granted July 13, 1886, upon the application of Anson O. Kittredge, of Slate Hill, and Frank M. Leavitt, of Brooklyn, New York, for an improvement in "Squaring Shears," was erroneously issued to said Kittredge and Leavitt instead of to *The Vulcan Company, of Pennsylvania*, assignee of the entire interest in said invention; that the proper correction has been made in the files and records of the case in the Patent Office, and should be read in the Letters Patent to make it conform thereto.

Signed, countersigned, and sealed this 27th day of July, A. D. 1886.

[SEAL.]

Countersigned:

M. V. MONTGOMERY,
Commissioner of Patents.

H. L. MULDROW,
Acting Secretary of the Interior.