

(No Model.)

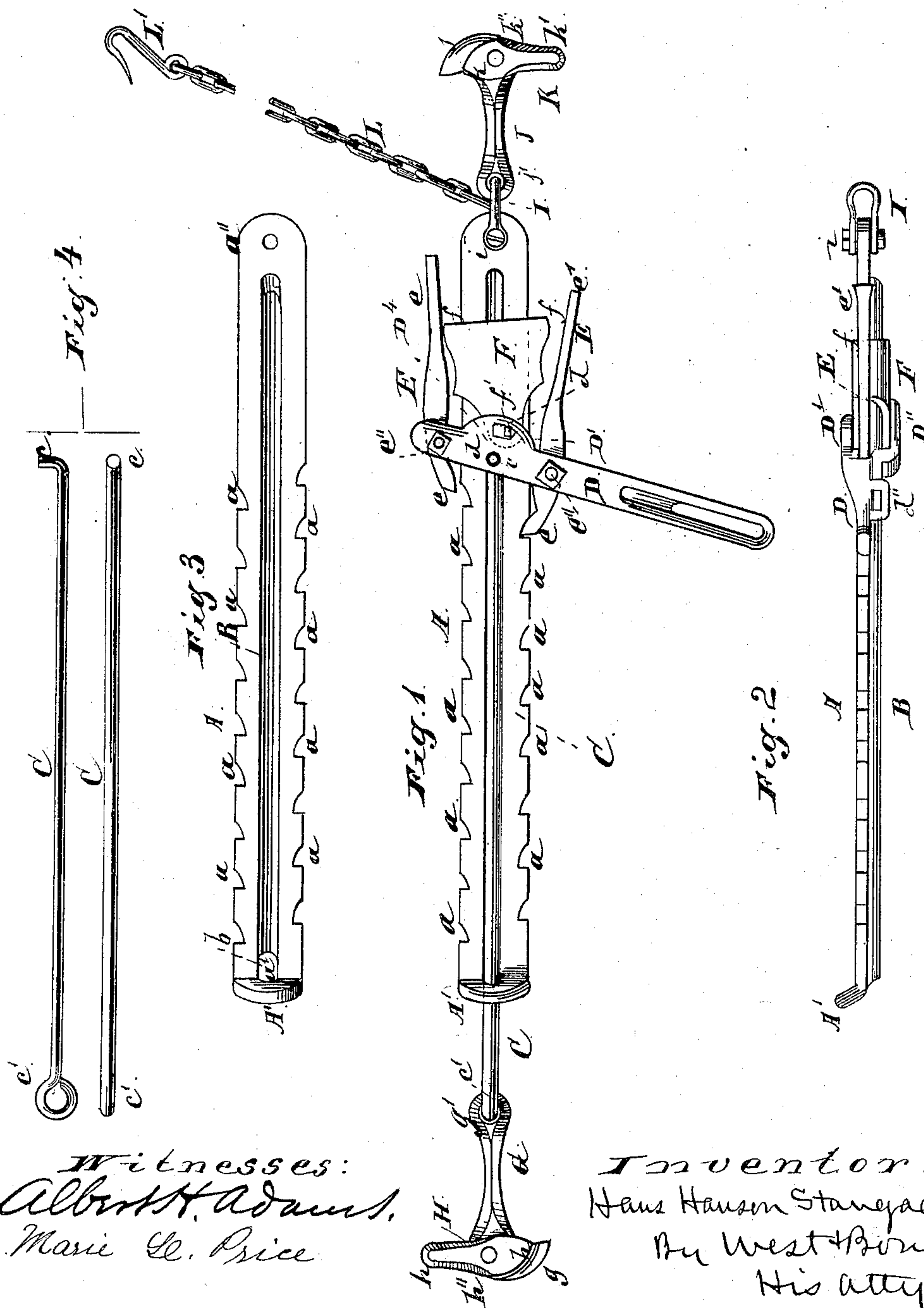
3 Sheets—Sheet 1.

H. H. STAUGAARD.

WIRE STRETCHER.

No. 324,893.

Patented Aug. 25, 1885.



Witnesses:
Albert H. Adams,
Marie E. Price

Inventor:
Hans Hansen Staugaard
By West Bond
His attys.

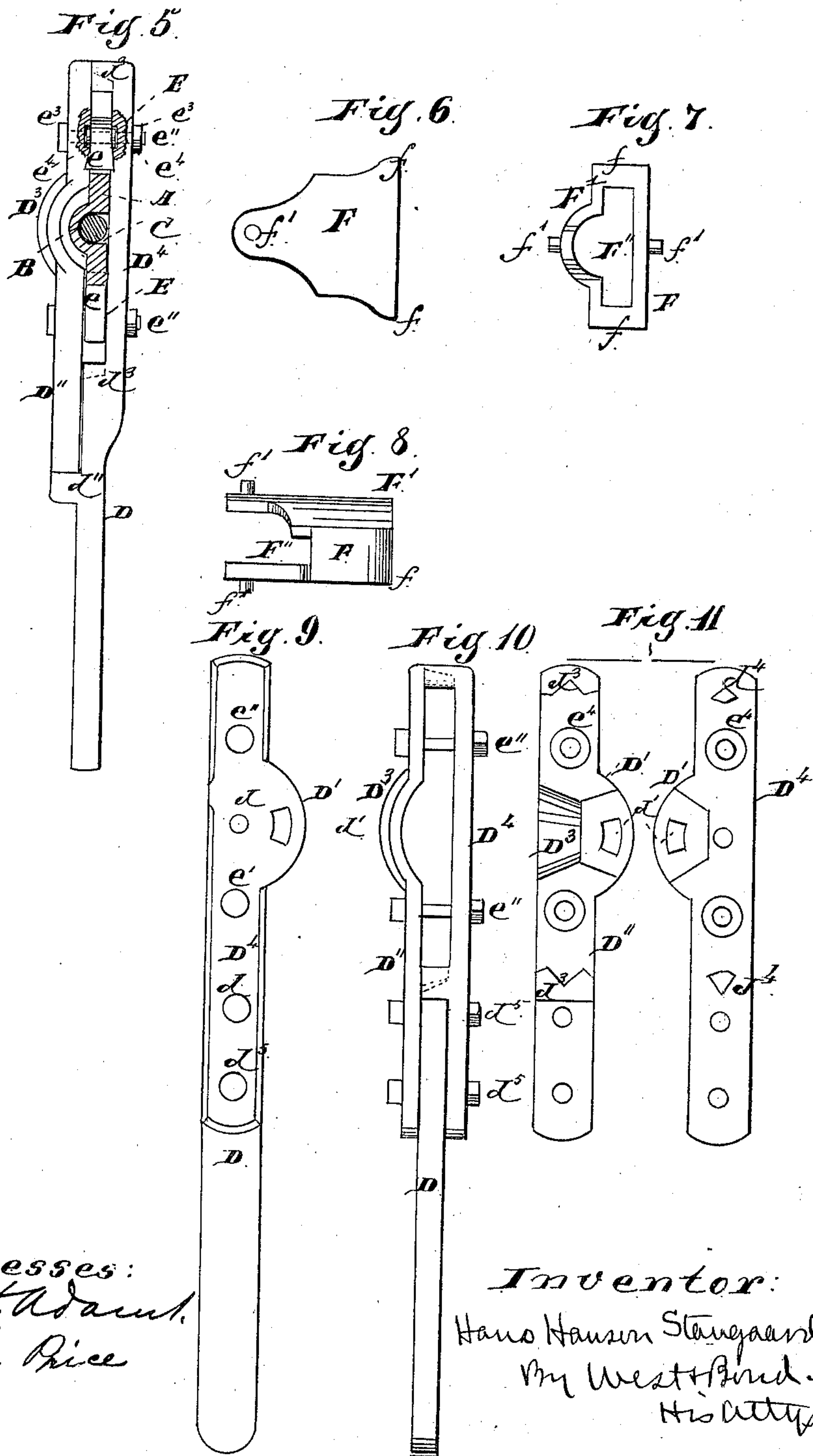
(No Model.)

3 Sheets—Sheet 2.

H. H. STAUGAARD.
WIRE STRETCHER.

No. 324,893.

Patented Aug. 25, 1885.



(No Model.)

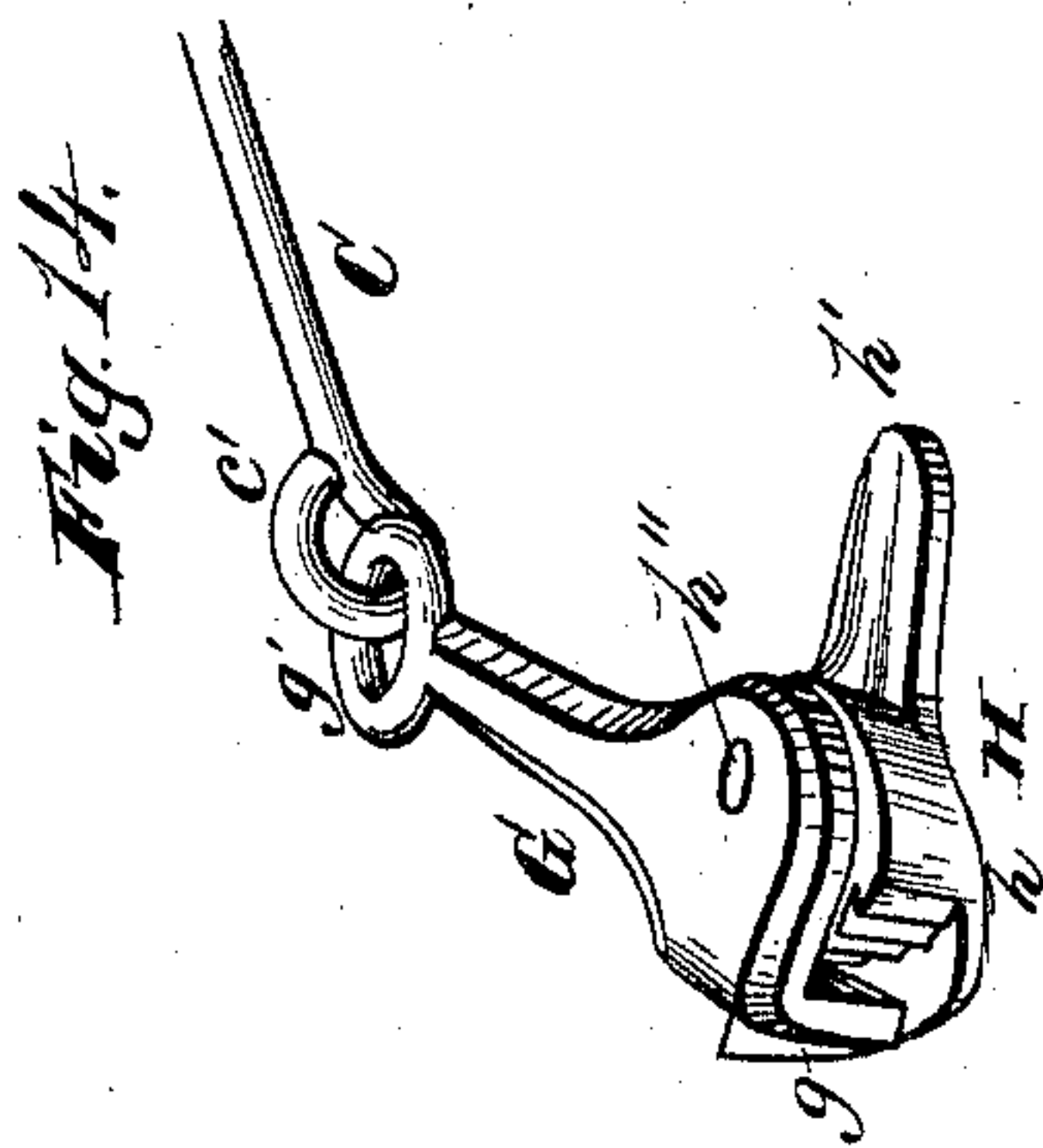
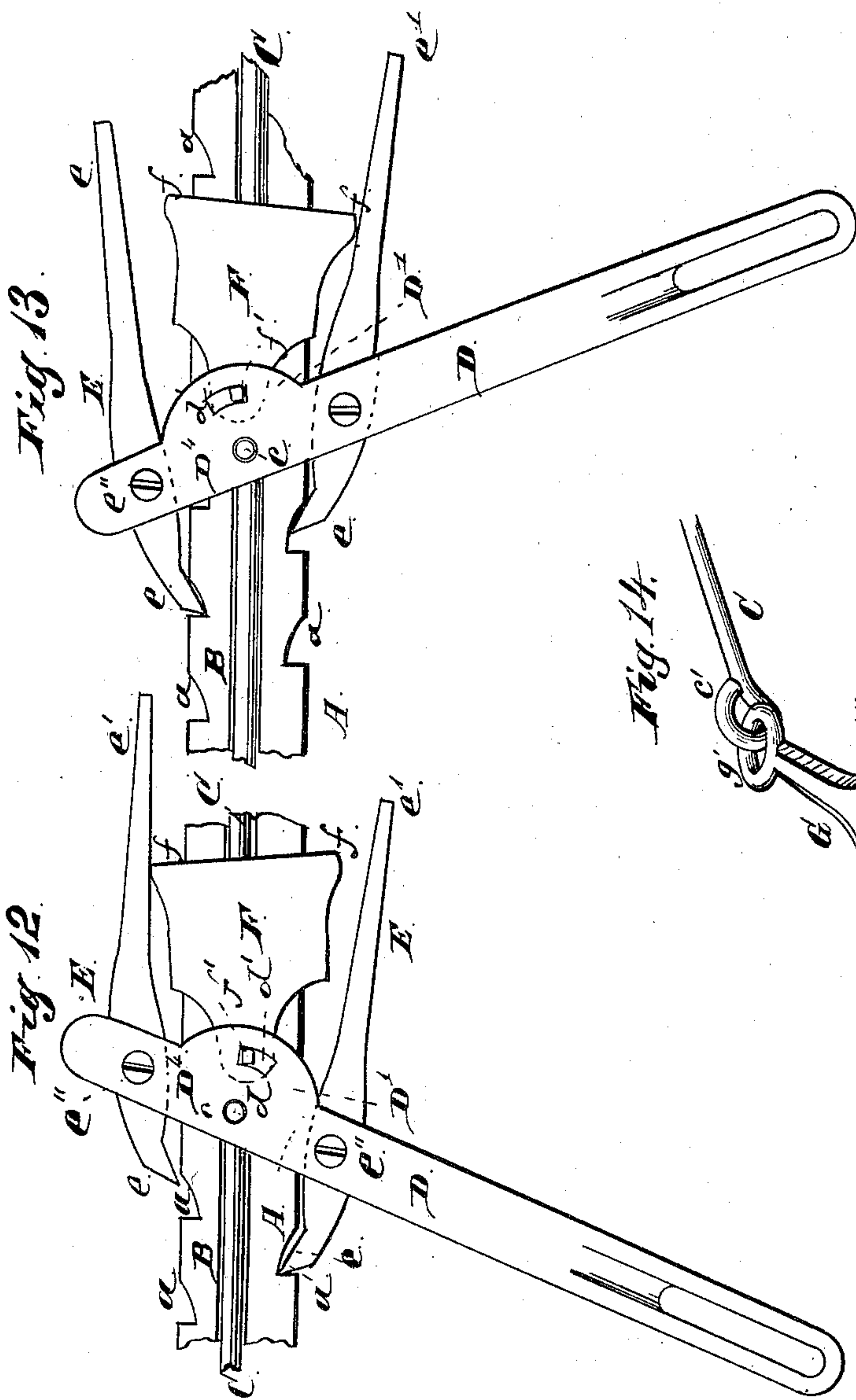
3 Sheets—Sheet 3.

H. H. STAUGAARD.

WIRE STRETCHER.

No. 324,893.

Patented Aug. 25, 1885.



Witnesses:
Albert H. Adams.
Marie L. Price

Inventor:
Hans Hanson Staugaard.
By West & Bond.
His attys.

UNITED STATES PATENT OFFICE.

HANS HANSEN STAUGAARD, OF SYCAMORE, ILLINOIS, ASSIGNOR TO ABRAM ELLWOOD, OF SAME PLACE.

WIRE-STRETCHER.

SPECIFICATION forming part of Letters Patent No. 324,893, dated August 25, 1885.

Application filed April 27, 1885. (No model.)

To all whom it may concern:

Be it known that I, HANS HANSEN STAUGAARD, residing at Sycamore, in the county of De Kalb and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in the Wire-Stretchers, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete tightener with the attaching-chain broken out; Fig. 2, an edge elevation with the wire clamps removed; Fig. 3, a side elevation of the ratchet-bar; Fig. 4, elevations of the draw-rod; Fig. 5, an end elevation with the ratchet-bar in section; Figs. 6, 7, and 8, details of the block or head for operating the tail-end of the dogs; Figs. 9, 10, and 11, details of the head and lever carrying and operating the dogs; Figs. 12 and 13, details showing the position of the lever-dogs and tail-block at the limit of the forward and backward movement of the lever, respectively. Fig. 14 is a detailed view of the wire-gripper.

This invention relates to that class of wire-stretchers in which a central draw-rod connected with a lever carrying dogs working on opposite edges of a ratchet-bar furnish the means for drawing the wire taut in connection with holding-clamps, and has for its objects to improve the construction of the ratchet-bar; to improve the location and operation of the central draw-rod and the lever by means of which such draw-rod is worked; to improve the operation of the dogs by insuring their engagement alternately with opposite sides of the ratchet-bar; to improve the coacting relation between the several parts; to improve the attachment of the dogs with the lever or lever-checks, and prevent the overscrewing of the pivotal bolts from affecting the working of the dogs, and to improve generally the construction and operation of the stretcher as a whole; and its nature consists in the several parts and combinations of parts hereinafter described, and pointed out in the claims as new.

In the drawings, A represents the ratchet-bar, provided with notches *a* on its edges, which notches may be arranged in line cross-wise, or arranged as shown in Fig. 3. This

bar is to be made of wrought-iron, steel, or other suitable material with a central depressed portion running nearly its entire length, and having its forward end A' turned at right angles, or nearly so, to the bar, as shown in Figs. 1, 2, and 3, and through this end in line with the depressed portion or recess in the bar itself is a hole, *a'*, and at the opposite end of the ratchet-bar in line with the central recess is a hole, *a''*.

B is the recess formed by the central depressed portion in the bar A, which recess is of sufficient depth for the diameter of the draw rod, and as shown, the metal at the forward or draw end of the depressed portion is cut out to leave an opening, *b*, coinciding with the hole *a'*.

C is the draw-rod, also made of wrought-iron, steel, or other suitable material, and of a diameter to fit within the recess B, passing through the hole *a'*, and having at one end a turned portion, *c*, to form the pivot for attachment to the lever, and having at its other end an eye, *c'*, for the attachment of a wire-clamp, and, as shown, the hole *b* enables the eye *c'* to be drawn in, thus extending to that extent the length of draw of the rod C.

D is the main or handle portion of the lever, and, as shown in Figs. 1 and 5, this handle portion extends up and forms one of the cheeks between which the dogs are pivoted, the other cheek being formed in this arrangement by a piece, D'', the inner end of which, as shown in Fig. 5, rests on a ledge or stop, *d'*, and this side or cheek D'', has a rounded-out portion, D³, to form a cavity on the inner face for the reception of the depressed portion of the ratchet-bar, as shown in Fig. 5. As shown in Figs. 9, 10, and 11, the arm or lever portion D fits between the ends of the cheeks or sides D'' and D⁴, and is secured in place by bolts, *d⁵*, and in this form of construction ledges *d³* with V-shaped notches are formed on the inner face of the cheek D'' to receive V-shaped projections *d⁴*, projecting out from the inner face of the cheek or side D⁴, by means of which notches and projections the parts are locked against side and end movement, and with the form of construction shown in Fig. 5, the same V-shaped notches and projections are used for locking purposes, as shown by the dotted

lines. The cheek or side D^4 at its forward edge in line with the depression B, when the lever is in position for use on the ratchet-bar, is provided with a hole, d , to receive the pin or turned end c of the draw-rod C, thus bringing the attaching-point of the draw-rod to the actuating-lever at the center, giving a true and perfect center draft from the lever for drawing on the draw-rod, and also bringing the pivotal connection of the draw rod to the lever on the interior of the lever, and aiding in maintaining a center line of draft in use. The stop or rest d' , in the form of construction shown in Fig. 5, is in the shape of a loop, the opening of which receives the end of the cheek or side D'' and with this form of construction the arm or lever D and the side or cheek D^4 are in a continuous piece, and the V-shaped notches are formed on the interior of the piece or cheek D^4 while the V-shaped projections are formed on the interior face of the cheek D'' ; but in both forms of construction the cheek D'' is to have a depressed portion, D^3 , for the reception of the depressed portion of the ratchet-bar, and each cheek at its rear edge, to the width of the ratchet-bar, is provided with an ear, D' , in which is a slot, d' , struck on the arc of a circle from the center of the opening d .

E is the dogs, two being used, one for each side of the ratchet-bar, and each pivoted by a bolt, e'' , between the cheeks or sides D'' and D^4 for the acting end e of each pawl to engage with its coacting notches on the edges of the ratchet-bar, as shown in Fig. 1, and the tail-end e' of each dog extends some distance to the rear of the actuating-lever to form arms or levers by which, in connection with a head, hereinafter described, the engaging ends are thrown into engagement or locked out of engagement by the movement of the actuating-lever. Each dog on its side at its pivotal point is provided with bosses e^3 , which enter recesses e^4 , formed in the inner face of the cheeks or sides D'' D^4 , and these bosses and recesses take all over-straining or drawing from off the bolts e'' , so that the dogs will be free to swing.

F is a block or head having a longitudinal recess, F'' , as shown in Fig. 7, for the passage of the ratchet-bar, and one wall of the head or block F is provided with a depression, F' , to receive the depressed portion of the ratchet-bar. The forward end of each side piece of the head or block F is provided with a pin, f' , which enters the recess d' in the ears D' , so that by the movement of the lever D the block is given a rocking movement on the ratchet-bar, for which purpose the width of the slot in the block is greater than the width of the ratchet-bar. At the rear end of the head or block, on each edge, is an extended portion, f , which forms a rest to engage the tail-end e' of each dog, to raise the tail-end and throw in the acting end to engage the notches a , and this raising of the tail-end is further assisted by the rocking movement given to the head or block F by the slot d'

and pin f' , which throws out the rear end of the head or block alternately with the forward and back movement of the lever D, and when not engaged the rest f for each tail e' holds the tail up, preventing the acting end of the dog from being thrown too far out.

G is an arm, having at one end an eye, g' , to hook into the eye c' of the draw-rod C, and having at its outer end a flange, g , the inner face of which, as shown, is curved.

H is an arm or lever pivoted at h'' to the outer end of the arm G, and having a curved flange to project over the curved face of the flange g , and a curved face to bite and hold the wire between the two faces, and having also a handle portion, h' , by which the biting-faces can be thrown open or closed. These arms G H together form a wire-clamp.

I is a stirrup or loop attached to the rear end of the ratchet-bar A by a pin, i , passing through the hole a'' .

J is an arm or plate having an eye, j' , to receive the loop I, and having at its outer end a flange, j , and a curved inner face, as shown.

K is an arm or lever pivoted at k'' to the arm J, and having a curved face, k , to coact with the curved face of the end of J to bite and hold the wire, and having a handle, k' , by which the curved faces can be made acting and non acting. These parts J K together form a wire-clamp for attaching the stretcher to the wire while the clamp G H is attached to the wire for the purpose of drawing the wire taut through the draw-rod C.

L is a chain having a hook, L' , by which the wire-stretcher can be attached to a post or other support, for the purpose of drawing the wire taut, the chain being passed around the post and the hook L' slipped into the proper link of the chain to make a secure attachment to the post.

The operation will be readily understood from the foregoing description. The stretcher is attached to a post or other support by the chain L and hook L' , and the wire-clamp J K, made to bite the wire back of the post, and the wire-clamp G H to bite the wire forward, the draw rod C being extended or projected to its full length, in which position the lever and dogs and head or block F are at the extreme forward end of the ratchet-bar, and with the attachment in the position shown in Fig. 1, the forward movement of the lever throws the under dog into engagement at its forward or acting end, e , with an under notch, a , so that with the continued forward movement the rod C is drawn back, the slide or head F also going back to the limit of the forward movement of the lever, in which position the upper dog, E, will have its acting end e thrown into engagement with an upper notch, a , so that on the backward movement of the lever D the draw rod and head will be forced back, such forcing back of the draw-rod and head occurring with each forward and backward movement of the lever until the limit of the ratchet-teeth is reached, when, if the wire is not sufficiently taut,

the wire clamp G H is released, and the dogs and heads again carried forward and the wire-clamp G H again made to bite the wire, and the dogs moved back on the ratchet-bar until the desired degree of tautness for the wire is reached.

As shown in Fig. 1, the handle D is down, but the handle D could be turned to stand up by reversing the bar A, the operation in either case being the same, so far as the drawing back of the rod C is concerned, by the engagement of the dogs with the ratchet-bar, as when the lever D is down, and the same result is also attained with the edge of the ratchet-bar standing horizontal and the lever lying horizontal, instead of vertical, or, in other words, the device is operative in whatever position the ratchet-bar, lever, and dogs may stand, as no matter what the position of the parts may be, the head or block F will act to throw the forward or acting end of the dogs into engagement with the ratchet-bar, and such throwing in is ensured by the rocking movement of the head or block by its connection through the slot *d'* and pin *f'* with the side pieces or cheeks of the actuating-lever; and no matter what the position of the attachment may be the line of draft will be a straight one and through the center of the attachment, by reason of the connection of the draw-rod on the interior of the actuating-lever at a point in line with the longitudinal center of the ratchet-bar. The slot *d'* in the lever permits of a greater throw of the lever, either forward or back, before operating the tail-block by engaging the pin *f'*, and by this arrangement the dogs are carried past the notches on the bar A and allowed to drop in the next succeeding notch, and a longer throw can be given to the lever before the block acts on the dog, thus enabling a longer space on the ratchet-bar to be covered with each movement of the lever than if the tail-block were attached to the actuating lever without the slot *d'*, and by the arrangement of lever, dogs, and tail-block shown, the necessity of maintaining the lever-center in an exact line with the center of the ratchet-bar, to hold the dogs out of engagement, is obviated, as the slot *d'* allows the tail-block to assume a normal position before the lever is straight, thereby disengaging the dogs and allowing the drawing devices to be advanced for the next operation of the stretcher. The depression at the center of the ratchet-bar longitudinally adds increased strength to the bar, so that a very thin, flat bar can be used without liability of springing in use, as would be the case if a thin flat bar without the groove were used, and with a thin flat bar, if it becomes bent, it is impossible to operate the dogs, but this objection cannot occur with the depressed bar, as it will not bend under ordi-

nary usage, and if a heavy bar were used sufficient to stand the strain in use, it would make the stretcher, as a whole, very heavy and cumbersome to operate.

I am aware of the invention of Andrew J. Upham, filed April 29, 1884, Serial No. 129,793, and do not claim anything that is shown or claimed therein.

What I claim as new, and desire to secure by Letters Patent, is—

1. A bar, A, having ratchet-teeth on opposite edges and a central longitudinal depression, B, and a draw-rod fitting in said depression, substantially as and for the purpose set forth.

2. The bar A, having ratchet-teeth on opposite edges, and a central depression, B, and formed with a turned end, A', in combination with a draw-rod, C, fitting in said depression and passing through end A', substantially as and for the purpose set forth.

3. The ratchet-bar A, provided with a central groove or recess, B, and draw-rod C, located in the recess, in combination with an actuating-lever, to which the draw-rod is centrally pivoted, substantially as described.

4. The actuating lever having its sides or cheeks formed with interior recesses, in combination with a pawl having bosses on its sides fitting in said recesses, and a pivot-bolt passed through the lever and pawl, substantially as described.

5. The ratchet-bar A, provided with a groove or recess, B, and rod C, in combination with a lever having sides or cheeks, and dogs E, acting on opposite sides of the ratchet-bar, for ensuring a central line of draft for the draw-rod, substantially as specified.

6. The combination, in a wire-stretcher, of a ratchet-bar, a hollow oscillating head receiving and sliding on said bar, an actuating-lever carrying pawls and oscillating the head for causing it to alternately bear against the tail-ends of the pawls, and a draw-rod moving longitudinally on the rack-bar, substantially as described.

7. The combination with the bar having ratchets on opposite edges of the operating-lever D, formed with cheek D⁴, and having cheek D'' secured thereto, and the two dogs pivoted to said lever to engage with the ratchets of said bar, substantially as described.

8. The combination, with the ratchet-bar A, of the operating-lever D, formed with cheeks D⁴ D'', each having an ear, D', formed with a slot, *d'*, the head F, provided with pins fitting in said slots, and dogs E, pivoted to said lever, substantially as described.

HANS HANSEN STAUGAARD.

Witnesses:

J. E. ELLWOOD,
R. ELLWOOD.