

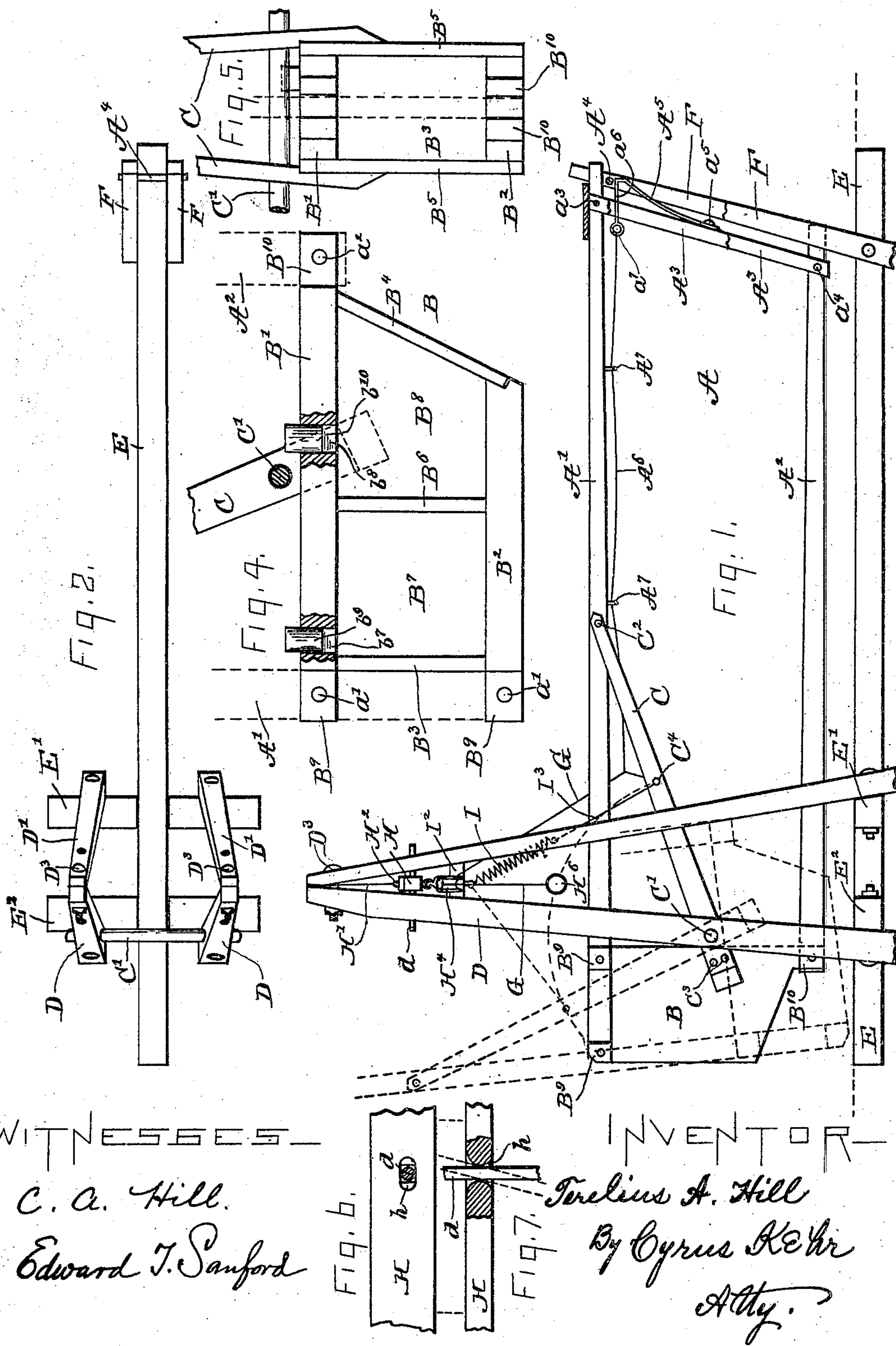
T. A. HILL.

GATE.

(Application filed June 6, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES—

C. A. Hill.
Edward T. Sanford

INVENTOR—

T. A. Hill
By Cyrus K. K. K.
Atty.

No. 696,676.

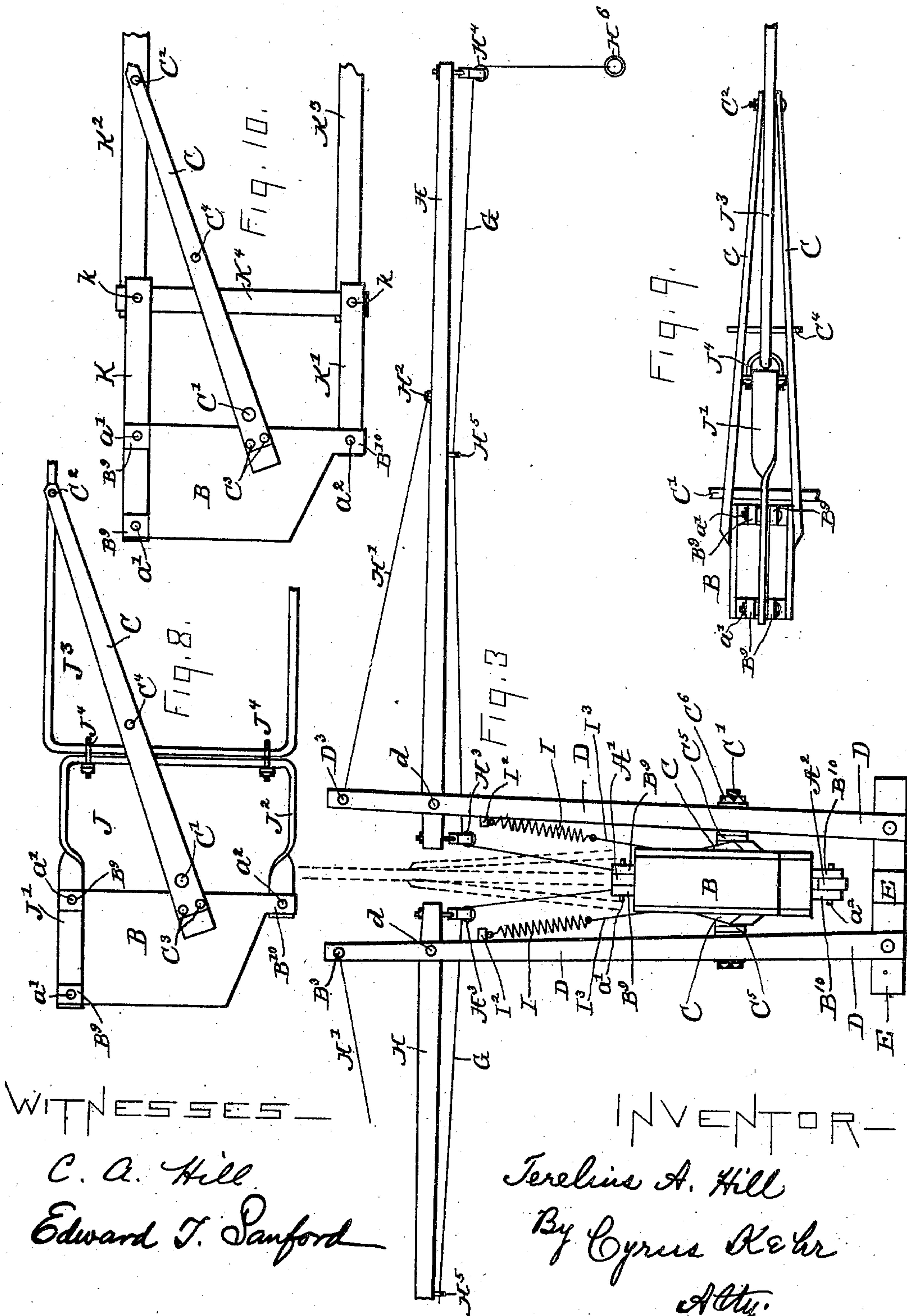
T. A. HILL.
GATE.

Patented Apr. 1, 1902.

(Application filed June 8, 1901.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES—

C. A. Hill
Edward J. Sanford

INVENTOR—

Tereline A. Hill
By Cyrus Kehr
Atty.

UNITED STATES PATENT OFFICE.

TERELIUS ALLEN HILL, OF KNOXVILLE, TENNESSEE.

GATE.

SPECIFICATION forming part of Letters Patent No. 696,676, dated April 1, 1902.

Application filed June 6, 1901. Serial No. 63,394. (No model.)

To all whom it may concern:

Be it known that I, TERELIUS ALLEN HILL, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Gates; 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to gates which extend across a roadway or entrance to a building or other similar passage.

The invention has reference particularly to gates which are supported at one end upon a hinge which is horizontal and perpendicular to the plane of the gate and located at one side of the passage or opening which the gate is intended to close.

The object of the improvement is to provide a simple and efficient gate embodying devices adapting the gate to be turned upon its hinge by pulling a cord or similar device extending perpendicularly, or substantially so, to the plane of the gate.

The improvement includes means for automatically latching the gate, means for effectively counterbalancing the gate upon its hinge, an improved post construction for supporting the gate, and other features, which will be hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of a gate embodying my improvement. Fig. 2 is a plan of the gate-supports. Fig. 3 is an elevation of the end of the gate adjacent to the hinge, the view being perpendicular to Fig. 1. Fig. 4 is a side view of the counterbalance-chest, said chest being shown without the front wall and in the position assumed when the gate is turned into the upright position. Fig. 5 is an end elevation of the counterbalance-chest shown in Fig. 4, the side walls being in place. Figs. 6 and 7 are details illustrating the manner of securing the arms which support the cords whereby the gate is shifted. Figs. 8, 9, and 10 are detail views illustrating modifications whereby my improvement may be applied to ordinary hinged gates.

A is the gate proper. This is shown composed of the top rail A', bottom rail A², front uprights A³, counterbalance-chest B, and braces C. Said gate is hinged on the horizontal shaft C', which shaft is supported by the posts D D, said posts being located at opposite sides of the gate and substantially opposite each other, said shaft extending through said posts and the braces C, immediately in front of the counterbalance-chest B. One end of each brace C is shown secured to the forward portion of the side of the counterbalance-chest, about midway between the top and bottom of the chest, and the opposite end of each such brace is attached to the top rail A' of the gate. Said braces C serve to stay the top rail in two directions—in a horizontal plane and in a vertical plane—because the top rail is narrower than the counterbalance-chest and extends midway over the latter, so that the braces C converge both horizontally and vertically. Said chest is shown composed of the front wall B', rear wall B², top wall B³, bottom wall B⁴, side walls B⁵, and partition B⁶. Said partition divides said chest into two compartments B⁷ and B⁸. When the gate is in the horizontal position, said compartments are alined vertically, B⁷ being above B⁸, and when the gate is in the upright position said compartments are alined horizontally, as shown in Fig. 4. A suitable aperture b⁷ extends through one of the walls of the compartment B⁷, and a similar aperture b⁸ extends through one of the walls of the compartment B⁸. A plug b⁹ may be used to close the opening B⁷, and a similar plug b¹⁰ may be used for closing the opening b⁸. The partition B⁶ is located adjacent to the shaft C', so that said compartments are at opposite sides of a plane cutting the gate lengthwise and located near the shaft C'. By inserting more or less sand, gravel, or any other suitable weight material through the apertures b⁷ and b⁸ not only can the aggregate of the weight of said chest be adjusted with reference to the aggregate weight of the gate at the opposite side of the shaft C', but the weight in each compartment may be so proportioned as to properly adjust the counterbalance at each side of the shaft C' when the gate is in the upright position. In this way the counterbalance may be readily adapted to any peculiarity of construction in the gate

whereby the weight at the top and bottom of the gate is varied. This means for adjusting the counterbalance is frequently useful. Even when a number of gates are constructed
 5 as similar as to shape and size as possible there are differences in weight of the same pieces, which will require a corresponding adjustment of the upper and lower portions of the counterbalance. For example, if the bot-
 10 tom rail A² or other pieces at the lower portion of the gate are disproportionately heavy on account of the density of the wood or its absorption of water or if in making the gate an additional piece is applied, so as to in-
 15 crease the weight of the lower portion of the gate, then allowance is made for the excessive weight by drawing the plug b⁹ and inserting into the compartment B⁷ additional weight material until the desired approximation to
 20 equilibrium is again attained. The front wall B¹ and rear wall B² of the chest B have extensions B⁹, rising above the wall B³ to a height equaling, approximately, the vertical thickness of the top rail A¹. The spaces be-
 25 tween said extensions are of proper width to receive the thickest top rail A¹ which it is probable will be used. At its lower end the wall B¹ has similar extensions B¹⁰. The top rail A¹ rests in the recesses between the ex-
 30 tensions B⁹ B⁹ and is therein suitably secured, as by bolts or pins a¹, reaching through said extensions and rail. The bottom rail A² extends into the recess between the exten-
 35 sions B¹⁰ and is therein suitably secured, as by a pin or bolt a², reaching through said extensions and rail.

The braces C are preferably detachably secured, as by a bolt C², extending through said braces and the top rail A¹, and by one or more
 40 bolts C³, extending through said braces and the chest B, and the uprights A³ are preferably removably secured by a bolt a³, extending through said uprights and the top rail, and a similar bolt a⁴, extending through said
 45 uprights and the bottom rail A². When constructed in this form, the gate may be readily separated and the parts crated for shipment in knockdown form. Furthermore, by thus making the parts of the gate separable my
 50 improvement may be readily and economically applied to ordinary hinged gates already constructed, as will be hereinafter described.

E is a sill extending horizontally beneath and parallel to the gate proper. The function
 55 of said sill is to form means, either exclusive of or supplemental to the ground, for securing the posts D D, D' D', and F F'. It is to be understood that said sill may be omitted and the several posts mentioned set into the
 60 ground. As the posts D D and D' D' are usually set farther apart at their bases than the width needed for the sill E, cross-sills E¹ E² may be applied to said sill E as a means for attachment of the lower ends of said posts
 65 D D and D' D'. The posts D and D' at the same side of the sill E and the gate converge

as they rise until they meet at the top, where they are firmly joined, as by a bolt D³. Said posts D D (and also the posts D' D') are separated sufficiently at the top to make room
 70 for the passage of the gate and for the arms which support the shifting-cords, as will be hereinafter described, and said posts D D (and also the posts D' D') preferably diverge
 75 from the bottom toward the top in order that greater stability may be attained by the braces which said posts constitute when the forming of a parallelogram by the posts D D, shaft C¹, and cross-sill E¹ is avoided.

A⁴ is a bolt or shaft joining the posts F im-
 80 mediately below the adjacent end of the top rail A¹, which rail extends between said posts. Said bolt or shaft serves to stay the said posts F, and it also serves as a rest for said top rail and as a stop for the latch A⁵. As shown,
 85 said latch consists of spring metal and is secured by its lower end to the front portion of the gate, as to one of the uprights A³, by means of a screw or bolt a⁵. At its upper end it is bent horizontally toward the hinge of
 90 the gate to make the hip a⁶, which is to extend beneath the bar or bolt A⁴ when the latch is in its normal position. The free end of said latch is bent into the form of an eye a⁷ or otherwise shaped for the convenient at-
 95 tachment of a cord A⁶, which may be led through suitable guides A⁷ A⁷ to the cords G, to which it is joined.

Two arms H are used for supporting the cords G, one of said arms being placed at each
 100 side of the gate, between the adjacent posts D and D', and hinged (so as to permit horizontal movement, as hereinafter described) on the shaft d, which extends horizontally through
 105 said posts. A guy-wire or similar brace H¹, extending from the bolt D³, which joins said posts to a staple or similar device H² on the arm H, serves to hold said arm in the horizontal position or in such approximation to
 110 the horizontal position as may be desired. A pulley H³, hung from the end of each such arm adjacent to the shaft d, and another similar pulley H⁴, hung from the opposite or free
 115 end of each such arm, serve as guides for the cords G. If so desired, one or more eyes or staples H⁵ upon said arm may support said cords between said pulleys. A ring H⁶ or similar device may be attached to the free end of
 120 each cord G, to be grasped by the hand for drawing said cord. Said ring or similar device should be of sufficient weight to draw the cord G and also the cord A⁶ taut without drawing the latter cord sufficiently to move
 125 the latch A⁵. From the pulleys H³ the cords G extend downward between the four adjacent posts to the shaft C¹, which shaft extends horizontally from one brace C to the other. The cord A⁶, Fig. 1, should be so short as to draw the cords G out of line toward the free
 130 end of the gate in order that when one of the cords G is drawn for the purpose of opening the gate said cord in becoming straightened

between its pulley H^3 and the shaft C^4 will draw the cord A^6 lengthwise toward the hinge end of the gate sufficiently to pull the latch A^5 from beneath the bar A^4 .

5 As shown by Fig. 1, the space between the posts D and D' at the shaft d is wider than the thickness of the arm H . Said arm is hinged to said shaft so as to allow the latter to turn in a horizontal plane to a limited degree. For this purpose the said arm may have an elongated aperture h for receiving said shaft d , as illustrated by Figs. 6 and 7, the former being an elevation and the latter a sectional plan. This lateral movement of said arm is facilitated by the flexible guy H' . This provision for lateral movement makes it possible for a person on a vehicle or on a horse to shift said lever into a convenient position while drawing the cord G , and it also makes possible the shifting of said arm so as to allow the pulley H^3 to follow to a limited extent the movement of the gate while the latter is being shifted.

It is to be observed that the adjacent ends of the arms H must be separated sufficiently to allow the gate to pass between said ends, as indicated by the dotted lines in Fig. 3.

To aid in establishing and maintaining the proper distance between the upper ends of the posts D and D' , suitable washers C^5 may be inserted between said posts D and the braces C . Then when the nut C^6 on said shaft C' is tightened stability is given to said posts and to the gate.

35 As an adjunct to the counterbalance-chest or as a substitute therefor, if so desired, I interpose between the posts D and D' and the gate a contracting spring I , which is put under tension as the gate approaches either limit of its range of movement. Said spring may be applied in any one of several ways. I show its upper end attached to a horizontal cross-bar I^2 , extending from one of the posts D to the adjacent post D' , while the lower end of said spring is attached by means of a cord I^3 to the shaft C^4 , (to which the cord G is also attached.) The aggregate length of said spring and the cord I^3 is such as to put the spring under strain to such an extent as may be desired when the gate is in the horizontal position. The point of attachment on the bar I^2 is so located as to make the distance from said point to the shaft C^4 substantially the same when the gate is in the horizontal position or when it is tilted upward beyond its axis. Thus the spring will become engaged as the gate is approaching either limit of its range of movement, and the resistance of the spring will gradually reduce the momentum of the gate and prevent shock as the gate reaches its limit.

The spring I is preferably duplicated, one being located at each side of the gate, to the end that the spring action may not be at only one side of the plane of the gate and tend to draw the latter sidewise. It is obvious that the strength of the spring or springs I and

the weight of the counterbalance-chest may be relatively varied.

Referring now to Figs. 8 and 9, the top rail A' and the bottom rail A^2 of Fig. 1 are omitted, and the arms J' and J^2 of a U-shaped bar J are applied to the counterbalance-chest by the pins a' and a^2 . To this U-shaped bar the rectangular frame J^3 of a common form of metallic gate is attached by suitable clamps J^4 , extending around the vertical portion of said bar J and the vertical portion of said gate-frame J^3 . The braces C extend from the chest B to the upper portion of said frame J^3 and are there secured by the bolt C^2 used in Fig. 1. It is not important whether the clamps J^4 secure the frame J^3 against lateral turning on the member J , for such turning is prevented by the braces C . This will be apparent by an inspection of Fig. 9.

In Fig. 10 there is shown a modification of the form illustrated in Figs. 8 and 9. Bars K and K' take the places, respectively, of the inner ends of the top rail A' and bottom rail A^2 , the attachment of said members being again formed by means of the pins a' and a^2 . K^2 , K^3 , and K^4 , respectively, are the top rail, bottom rail, and end upright of an ordinary wooden-frame gate, said parts overlapping at the corners. Bolts k , extending through the end upright K^4 and the adjacent bar K or K' , join the frame to the bars K and K' . The brace C , again secured to the counterbalance-chest B , extends obliquely upward and is joined by the bolt C^2 to the top rail K^2 of the gate-frame.

By means of the modifications illustrated by Figs. 8, 9, and 10 my improvement may readily be applied to gates already constructed. The counterbalance-chest, the braces C , the posts D and D' and F , and the arms H and other parts may always be made alike, if so desired.

I claim as my invention—

1. A gate supported on a horizontal hinge and having a counterbalance-chest comprising two compartments which are at opposite sides of a plane cutting said gate lengthwise and near which said hinge lies, substantially as described.

2. A gate supported on a horizontal hinge and a counterbalance-chest comprising two compartments which are at opposite sides of a plane cutting said gate lengthwise and near which said hinge lies, each such compartment having an aperture and removable means for closing said aperture, substantially as described.

3. A gate having a detachable counterbalance-chest and braces, C , extending from the sides of said chest to the top rail of the gate and having holes for receiving a hinge-shaft, C' , between the point of attachment to said chest and the point of attachment to the frame of the gate, substantially as described.

4. A counterbalance-chest for a gate, said chest being provided at its upper portion and at its lower portion with means for detach-

ably securing horizontal bars, substantially as described.

5 5. A counterbalance-chest for a gate, said chest being provided at its upper portion and at its lower portion with means for detachably securing horizontal bars, and braces leading from the sides of said chest toward the free end of the gate, substantially as described.

10 6. A gate having a top rail and a bottom rail extending, respectively, over and beneath a hinge, and a counterbalance-chest located between and detachably secured to said rails, substantially as described.

15 7. A counterbalance-chest substantially upright when the gate is in its closed position, a horizontal partition dividing said chest into two compartments, and suitable apertures for the insertion of weight material into said compartments, substantially as described.

20 8. A counterbalance-chest for a gate, said chest comprising side walls, top and bottom walls, and front and rear walls, the latter hav-

ing extensions for the attachment of said chest to the gate, substantially as described.

25 9. The combination with two pairs of converging posts, of a gate hinged to two of said posts standing at opposite sides of said gate, a shaft, *d*, supported by the posts at one side of said gate, and an arm, *H*, secured to said shaft by a hinge permitting horizontal movement of said arm, substantially as described. 30

10. The combination with two pairs of converging posts, of a gate hinged to two of said posts standing at opposite sides of said gate, and a cord-supporting arm hinged to said posts above said gate to move in a horizontal plane, substantially as described. 35

In testimony whereof I affix my signature, in presence of two witnesses, this 3d day of June, in the year 1901.

TERELIUS ALLEN HILL.

Witnesses:

J. H. FRANTZ,
CYRUS KEHR.