Oct. 13, 1970 K. G. APPELL ET AL 3,533,189

SELF-ALIGNING SWING GATE SYSTEM

Filed Nov. 18, 1968

2 Sheets-Sheet 1

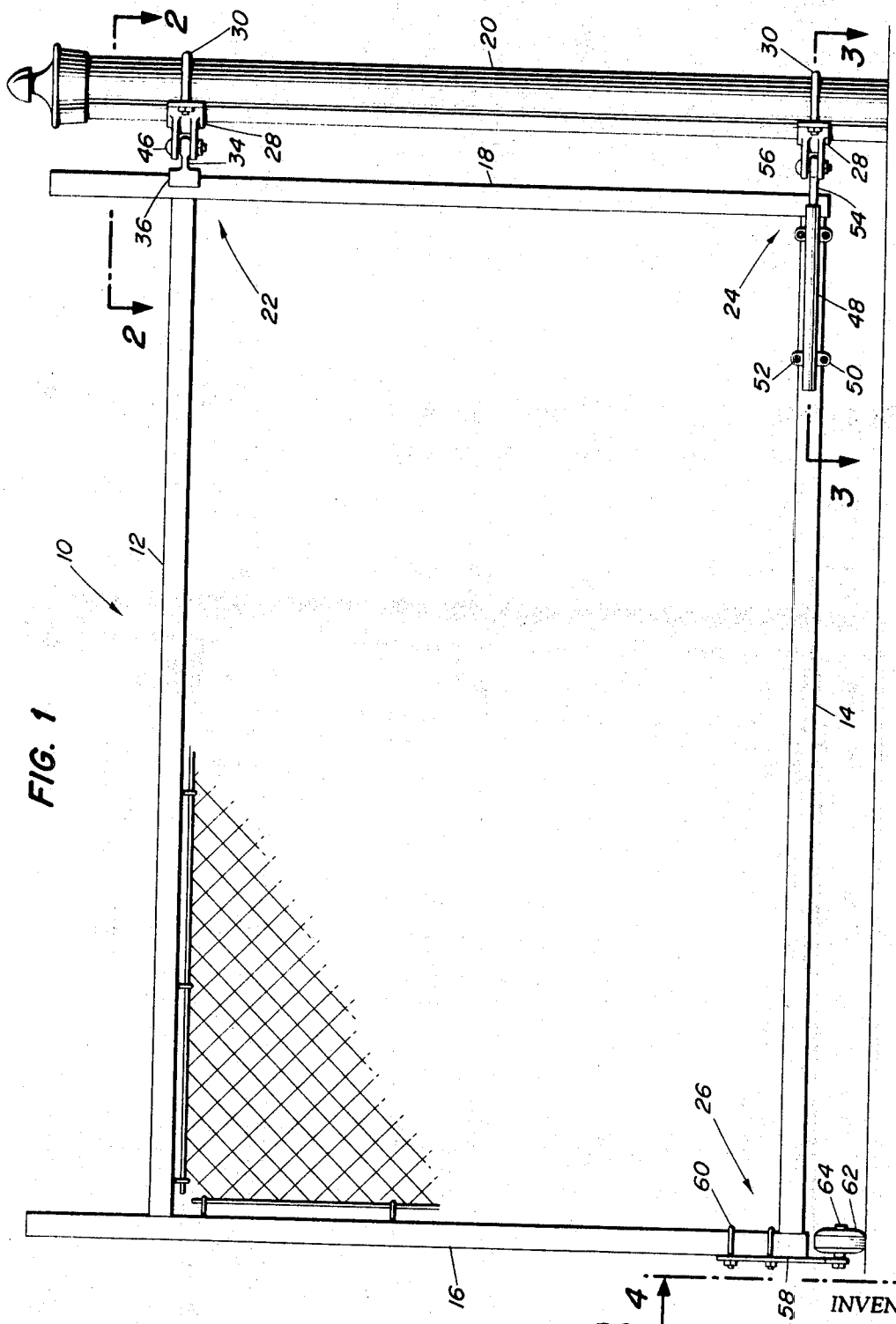


FIG. 1

INVENTORS
ROBERT R. BRANNAN
KENNETH G. APPELL

BY Walter G. Finch
ATTORNEY

Oct. 13, 1970 K. G. APPELL ET AL 3,533,189

SELF-ALIGNING SWING GATE SYSTEM

Filed Nov. 18, 1968

2 Sheets-Sheet 2

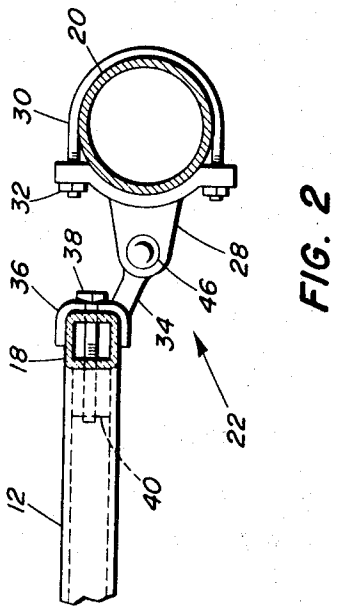


FIG. 2

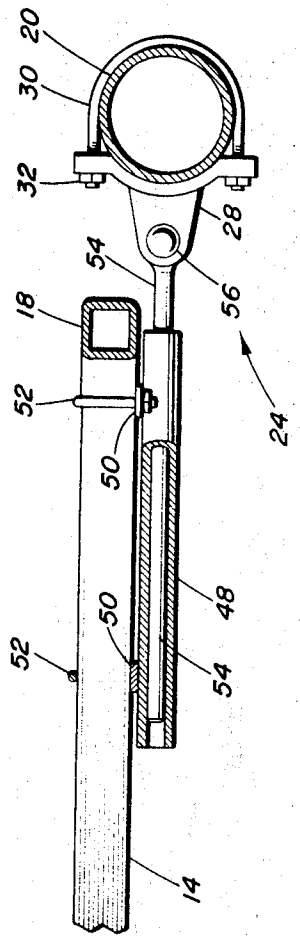


FIG. 3

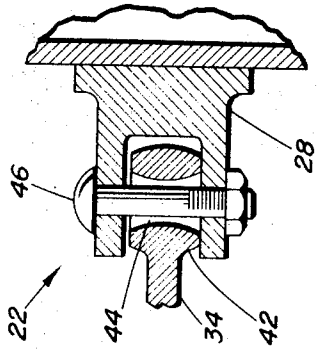


FIG. 5

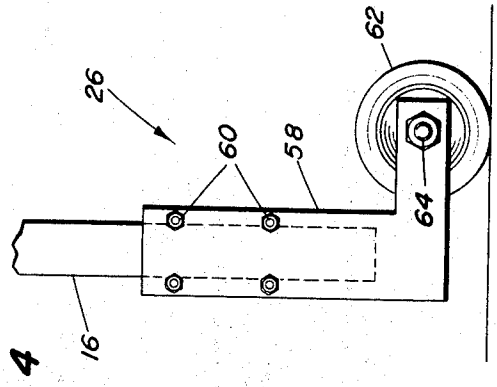


FIG. 4

ROBERT R. BRANNAN
KENNETH G. APPELL
INVENTORS

BY Walter G. Finch
ATTORNEY

United States Patent Office 3,533,189 Patented Oct. 13, 1970

3,533,189

SELF-ALIGNING SWING GATE SYSTEM

Kenneth G. Appell and Robert R. Brannan, Baltimore, Md., assignors, by mesne assignments, to Anchor Post Products, Inc., Baltimore, Md., a corporation of Delaware

Filed Nov. 18, 1968, Ser. No. 776,585
Int. Cl. E05f 7/06
U.S. Cl. 49—396 1 Claim

ABSTRACT OF THE DISCLOSURE

A swing gate is disclosed which has a support wheel and one hook type hinge. The other hinge features a follow-up bracket arrangement that allows the gate to be swung against a grade in the roadway and self-adjust thereto.

This invention relates generally to doors and gates, and more particularly to a bracket arrangement including a self-aligning hinge which facilitates the movement of a horizontal swing gate of considerable length over sloping terrain.

Where security fences extend across driveways, it is often a problem to arrange a gate wide enough for vehicle passage without massive measures to prevent sag. A wheel support on the end is only satisfactory where the entrance is perfectly flat and smooth; otherwise, the pintles may become unhinged.

In addition, the gatepost may become bent or loosened and generally unsatisfactory operation of the gate system will occur if the swinging end of the gate rises or falls any appreciable amount with the grade. The prior art is replete with parallelogram arrangements for gates, but none are applicable to rigid frame gates of modern metal construction.

It is, therefore, an object of this invention to provide an arrangement for improved swinging of elongated rigid frame gates.

Another object of this invention is to provide a self-adjusting pintle assembly for gate posts which will permit a gate to be lifted at the swinging end without dislodgement of the hinges.

Another object of this invention is to provide a gate hinge bracket with a degree of freedom in a direction solely in the plane of the gate away from the gate post.

The above described objects of this invention are realized in the structure of the sef-aligning swing gate system of this invention which comprises a rigid state supported at one end by offset wheel structure, and supported at the other end by a post offset through a pair of vertically adjustable hinges, said hinges having provision for self-alignment including toroidal holes in the hinge heads, and a cylindrical pin sliding arrangement adjustably engaging one of said hinges to the gate.

Other objects and attendant advantages of this invention will become more readily apparent and understood from the detailed specification and accompanying drawings in which:

FIG. 1 is an elevation of an improved gate post assembly having features of a self-aligning swing gate;

FIG. 2 is a detail view partly in section taken on line 2—2 of FIG. 1;

FIG. 3 is a detail view similar to FIG. 2 taken on line 3—3 of FIG. 1;

FIG. 4 illustrates a wheel support arrangement as viewed on line 4—4 of FIG. 1; and

FIG. 5 is a vertical section taken through a hinge.

Referring now to the details of the invention as shown in FIG. 1, reference numeral **10** indicates a gate. While this gate **10** may be of any rigid type, the example shows

a modern all-metal mesh construction having welded tubular metallic framework comprising upper and lower members **12** and **14**, respectively, and left hand and right hand members **16** and **18**, respectively.

Reference numeral **20** indicates a gate post which may be of the cylindrical pipe type and having an upper "fixed" hinge **22** and lower "sliding" hinge **24** upon which the gate **10** swings. This gate **10** is of considerable length and to prevent sag, the swinging end is supported on the ground by a wheel assembly **26**.

Both hinges **22** and **24** are provided with identical bifurcated trunnions **28**, each clamped to the gatepost **20** with a U-bolt **30** and nuts **32**, as best shown in FIGS. 2 and 3.

The upper hinge assembly **22** is connected by means of an arm **34** to the gate. A saddle bracket **36** on the end of arm **34** embraces the right hand member **18** of the gate and is secured there by means of a bolt **38** and an expandable nut **40**. The latter may advantageously be concealed in the upper gate member **12** as shown in FIG. 2. The hinge head **42** of bracket **34** has a toroidally shaped hole **44** for the pin **46**. This allows the bracket **34** to both horizontally and vertically pivot upon trunnion **28** as apparent from FIG. 5.

A cylinder **48** having brackets **50** is clamped to the side of lower member **14** of the gate **10** with U-bolts **52**. An eyebolt **54** extends slidably from within this cylinder **48** and it is pivotally attached to the lower trunnion **28** by a pin **56**.

The swinging end of the gate as shown best in FIG. 4 has an L-bracket **58** clamped by U-bolts **60** to the lower end of left hand member **16** as shown in FIGS. 1 and 4. A wheel **62** is mounted on this bracket **58** on an axle **64**.

The arrangement of hinge assemblies **22** and **24** as illustrated with the "fixed" hinge **22** at the top and "sliding" hinge **24** at the bottom would be used where the gate **10** will be swung toward an ascending grade.

On the other hand, if the gate **10** is to swing toward a descending roadway, the hinges **22** and **24** are interchanged employing the "sliding" hinge **24** uppermost. In either case, the wheel **62** follows the contour of the ground and the vertical tilt (in the plane of the gate) causes the cylinder and sliding bolt to accommodate the changing relationship of the member **18** of the gate and the post **20**.

Obviously many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood that the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. In a rigid swing gate having self-aligning hinge means attached to a post and wheeled support means attached tangentially to the swinging end of the gate, the improvement comprising: two spaced hinges having U-clamp attachment between the gate and the post, including a first said hinge having a cylindrical pin, a head having a toroidal-shape hole operatively engaging the pin, and an arm having a saddle bracket affixed at an angle thereon for offset attachment of the gate through said hinge to the post; a second said hinge comprising a cylinder affixed to the side of said gate parallel to the plane of the gate, a slidable eyebolt in longitudinally spaced engagement with the cylinder and extending therefrom, said eyebolt having a toroidal-shaped hole, and cylindrical-pin pivotal means affixed to the post in alignment with said cylinder and engaging the toroidal-shaped hole in the extension of the eyebolt; and said wheeled support means comprising a wheel and a substantially flat L-bracket U-clamped to the end of the gate and mounting the wheel thereon within the length of the gate and offset from the plane of the gate, whereby all said hinges and wheeled support means are similarly offset from

the plane of the gate and said hinges yield in the plane of the gate in self-aligning compliance with support by said wheeled support means.

References Cited

UNITED STATES PATENTS

152,049	6/1874	Roderick	49—396 X
572,228	12/1896	Swink	49—396 X
1,731,028	10/1929	Soss	49—396 X
3,375,544	4/1968	Suska	16—128
93,027	7/1869	Wilde	49—396
498,124	5/1893	Keith	49—396
1,200,879	10/1916	Harrison	16—130
1,283,359	10/1918	Thomson.	
1,330,680	2/1920	Caldwell	16—158
1,443,446	1/1923	Watermann	49—396
1,634,337	7/1927	Panoch	16—158
2,665,508	1/1954	Swanson	49—396 X
2,778,052	1/1957	Lucas	16—130
2,970,799	2/1961	Pinson	16—158 X

DENNIS L. TAYLOR, Primary Examiner

U.S. Cl. X.R.

16—130