(No Model.)

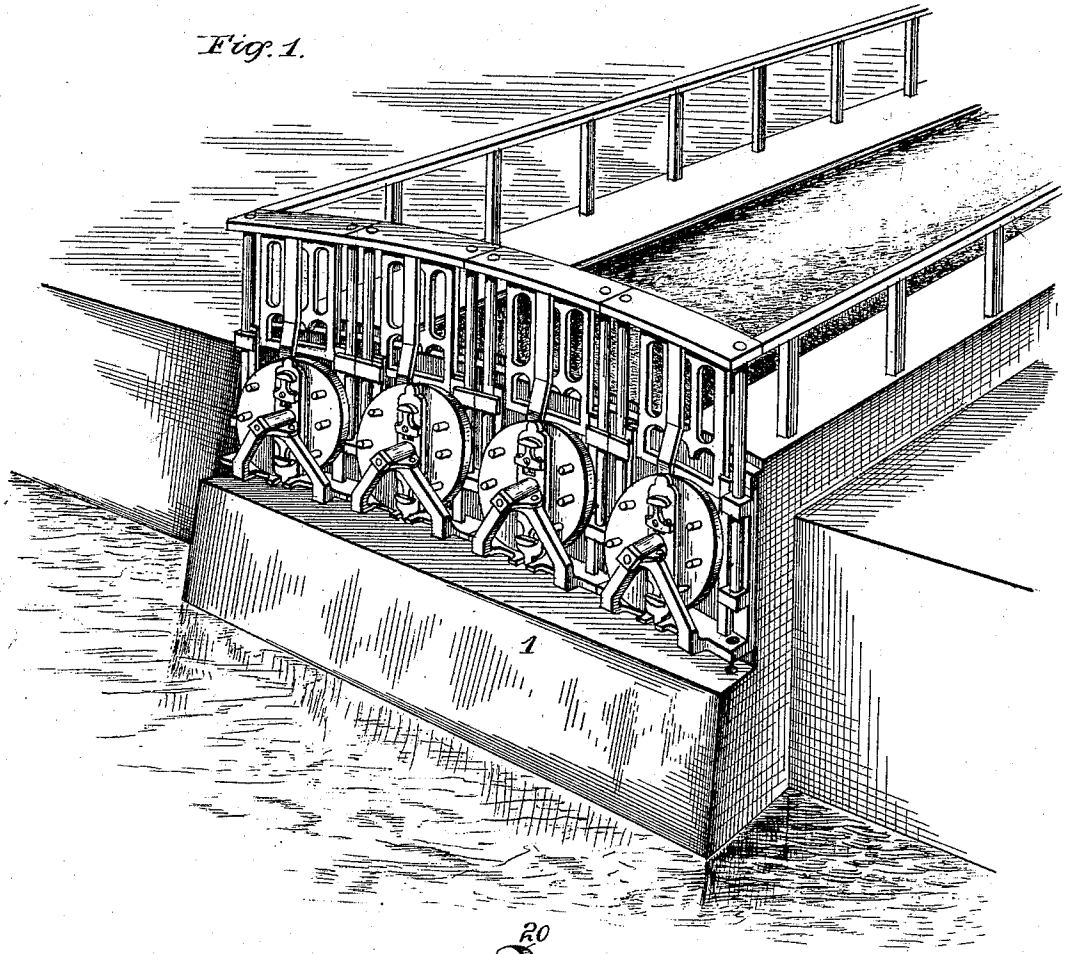
2 Sheets—Sheet 1.

# B. HABERTHUR & J. MANDEL.

## BRIDGE GATE.

No. 500,654. Patented July 4, 1893.

Fig. 1.



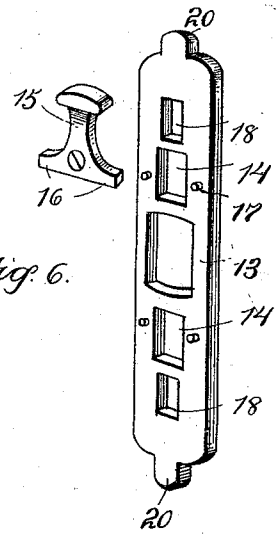




Fig. 6.

Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

# B. HABERTHUR & J. MANDEL.

## BRIDGE GATE.

No. 500,654. Patented July 4, 1893.

Fig. 2.

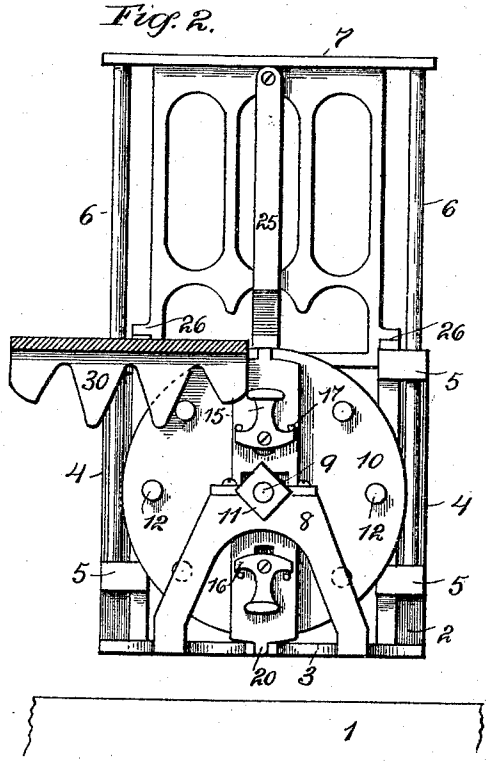



Fig. 3.

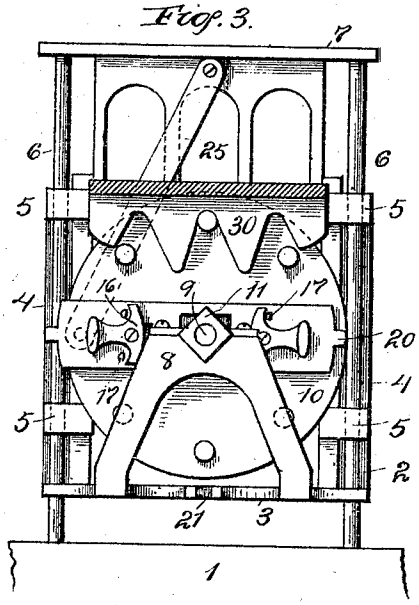



Fig. 4.

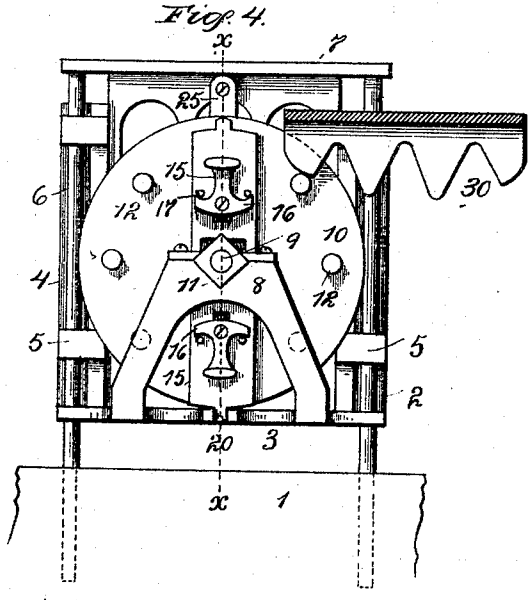
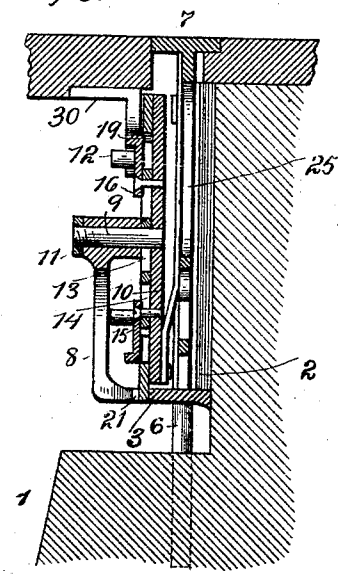



Fig. 5.




Witnesses.
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# UNITED STATES PATENT OFFICE.

BENEDIKT HABERTHUR AND JOSEPH MANDEL, OF LOGANSPORT, INDIANA, ASSIGNORS OF ONE-HALF TO JAMES P. HENDERSON AND OTTO A. KRAUS, OF SAME PLACE.

## BRIDGE-GATE.

SPECIFICATION forming part of Letters Patent No. 500,654, dated July 4, 1893.

Application filed April 5, 1893. Serial No. 469,145. (No model.)

*To all whom it may concern:*

Be it known that we, BENEDIKT HABERTHUR and JOSEPH MANDEL, citizens of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented certain new and useful Improvements in Automatic Gate-Operating Mechanisms; and we 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.

Our invention relates to improvements in automatic gate operating mechanisms, designed for use with swinging drawbridges, and it consists in the construction and arrangement of parts hereinafter to be fully described and particularly pointed out in the claims.

One object of our invention is to provide an automatically rising gate, actuated solely by the movement of the swinging drawbridge, operating in whichever direction the bridge may move, and rising in sections, so that the portions of the roadway from which the drawbridge has swung clear may be at once protected, and not be obliged to wait for such protection until the gate has swung entirely free of the road way.

Another object of our invention is to make the operative parts of the gate raising mechanism extremely simple in construction, so as not to be liable to be disarranged or injured by the climatic changes to which such mechanism must necessarily be exposed and also to make it so cheap in construction as to enable it to be fitted to existing bridges.

Hertofore, gates of this character have usually been made in one section, and have been let down from housings arranged above the end of the road abutting against the bridge, or have been raised from a position below the roadbed. Gates of this character have also been made which are operated from the side of the roadway, but in most of these cases, ropes or pulleys have been used as part of the operating mechanism of the gate, and the mechanisms have otherwise been such, as to render them incapable of enduring the hard usage to which they are exposed in the common course of traffic.

One feature of our gate operating mechanism is that ropes or pulleys are not used in the construction of the same, but all of the parts thereof are made in such a solid, compact, and substantial form as not to be liable to be disarranged by the influences of wind and weather, and not subject to undue deterioration or wear. The parts of our mechanism are also so simple in form that they can be easily adjusted in place, and can be easily replaced in case of accident to the same.

A feature of our invention lies in the fact that our bridge is operated in sections; the sections rising successively as the drawbridge swings outward away from the land, thus preventing any person or vehicle from being exposed to possible risk or danger while the bridge is still swinging open.

Our gate operating mechanism consists in a series of rotating disks or plates arranged below the roadway, each of which is connected at a point in its circumference to one of the vertically rising gate sections by a pivoted link, and is actuated by a section of gear teeth placed on the bottom of the bridge at the end of the same, the said gear teeth engaging with the series of studs or rods projecting from the circumference of each disk and, by rotating the said disk, causing the rising or falling of the gate section to which it is attached. Suitably constructed locking devices, released just before the gate sections are to be opened, hold the respective gate sections in their raised positions when the bridge is open, and in their lowered positions when the bridge is closed. The gate sections are guided in their reciprocating movement by rods which pass through suitable guiding plates arranged in the frame work of the gate operating mechanism.

Our invention is fully illustrated in the accompanying drawings forming a part of this application, in which the same reference numerals refer to the same or corresponding parts and in which—

Figure 1 is a perspective view of our gate operating mechanism, showing the gate raised, the drawbridge being open. Fig. 2 is a detailed view of one of the gate sections, showing the same raised and about to be engaged by the gear teeth on the end of the bridge, in order to lower the same. Fig. 3 is a view of

the same gate section, showing the gate partially lowered. Fig. 4 is a view of the same gate section showing the gate entirely lowered, the gear teeth on the end of the bridge being about to pass away from said section. Fig. 5 is a section of Fig. 4 on the line $x$—$x$. Fig. 6 is a detailed view of the locking-plate and the pivoted dog used to operate the same.

Referring to the drawings, 1 represents the pier or abutment to which the gate operating mechanism is attached. The gate, as previously stated, is made in sections, in the drawings four such sections being shown, though the number of gate sections will be varied in accordance with the size of the bridge in connection with which the same is used. The respective gate sections are, however, similar in their construction, and therefore a description of one of them will suffice for all.

Referring then to Figs. 2, 3, 4, and 5, the numeral 2 represents the framework of the gate section and is formed of a horizontally extending piece 3, extending along the bottom of the framework, and two vertically rising portions 4, extending upward to nearly the level of the roadbed, and formed with the projecting pieces 5, through which the guide rods 6, attached to the gate section 7, pass. To the bottom plate 3, is fastened, the Λ-shaped bracket 8, which extends upward, and in the upper end of which is formed a bearing for the rod 9, to one end of which is fastened at its center the rotating disk 10, it thus forming the axis for the rotation of said disk. The nut 11, screwed on the outer end of said bolt holds the same in position. On the outer surface of the said disk 10, and arranged at stated intervals on the circumference of the same, are the studs or rods 12, which extend a short distance from the circumference. Intermediate of the bracket 8 and the rotating disk 10, is placed the locking-plate 12, which is shown in detail in Fig. 6. This locking-plate consists of a flat, narrow plate extending from top to bottom of the rotating disk 10, and is formed with a central slot 13, through which the bolt 9 passes, which slot is large enough to allow for an up or down movement of said locking-plate relative to said bolt. On either side of the central slot 13, are formed the slots 14, through each of which passes a bolt or screw, holding a locking dog 15 pivotally attached thereto. This locking dog is formed with the two side projecting portions 16, so that, when the locking dog is rotated on its axis by movement of the upper end of said dog, the said ends 16 will engage with the projecting lugs 17, placed on either side of the slots 14, and formed integral with the locking plate, and, by such movement raise the locking-plate 13 through the extent of its travel. The slots 18 are formed at either end of the locking-plate 14 and in these slots move the projecting lugs 19, which are attached to the rotating disk 10, (see Fig. 5) and which serve to limit the up and down movement of said locking plate. The said lugs 19 also hold the locking-plate 13 in a fixed position relative to the rotating disk 10, preventing said locking-plate from swinging around the rod 9 as a center. The locking-plate, 13, is formed at each end with a projecting lug 20, which lug, both when the gate section is in its raised and lowered positions, engages with a socket 21 formed in the bottom plate 3 of the framework of the gate operating mechanism, and thus locks the gate section in the position in which it then is.

The gate 7 is connected with the rotating disk 10 by means of the link 25, which is secured to the upper central portion of said gate section, and also to the disk 10, at a point near the circumference of the same. The point of connection to said disk is so chosen that it lies in a diametrical line with the lugs 19, which project from the surface of said rotating disk, so that when the gate section is either in its raised or lowered position, the said lever is on a line with the locking-plate 13, and in a position to be at once affected by any rotation of disk 10. The gate section 7, besides being guided by the rods 6, is further guided and held in position during its reciprocations by the projecting flanges 26, formed in the vertical portions 4 of the frame work of the gate mechanism. The gate 7 is formed with any desired configuration, and may be ornamented to any desired extent.

The operation of our gate operating mechanism is as follows:—On the lower side of the bridge, and at each corner of each end of the same, is secured a section of the gear teeth 30. The number of full teeth in each such set corresponds to that of the projecting lugs 12, placed on a semi-circumference of the rotating disk 10. The first and last tooth in each such section are made shorter than the rest, so that they will not engage with the said projecting lugs 12, for a purpose which will hereinafter appear. Commencing the description of our gate mechanism with the sections all raised, as that is the position shown in Fig. 1, and referring to Figs. 2, 3, and 4, it will be seen that when the gear teeth 30 approach the gate section, as the bridge is swung inward, the first tooth of such gear teeth does not strike the top projecting lug 12, which it would if it were of normal length, but passes the same and engages with the upper end of the locking dog 15, causing the same to turn upon its axis, and thereby raise the lower end of the locking-plate 13 out of the socket formed in the bottom plate 3 of the framework of the gate mechanism. The next tooth of the gear teeth will engage the top projecting lug 12, and, as the bridge still swings inward, will cause the disk 10 to rotate, this action being continued by each succeeding tooth. As there are as many teeth in the section of gear teeth as there are projecting lugs around a semi-circumference of the disk 10, positive rotation of said disk is assured. When the gate section 7 reaches its lowest position, the other end of the locking-plate 13 falls into the socket 21 formed in plate 3, and

thus securely locks the gate in its lowered position. The operation thus stated for one gate section is repeated by each gate section successively as the end of the bridge passes the same, until the bridge swings finally into position and the entire gate is lowered.

It is to be understood that a gate is placed at each end of the bridge.

The gate operating mechanism is actuated by a movement of the bridge in either direction, and its movement is at all times positive and certain. The parts forming the same are so few in number, and so simple in construction, that a disarrangement of the same very rarely takes place. When, however, such an accident happens, the broken parts can be readily replaced and the bridge again placed in perfect condition. We preferably make the various parts of our mechanism of iron, though any other suitable material may be used if desired, and the strength in construction gained thereby is such as to render an accident improbable. Our gate operating mechanism is very compact in form, and is comparatively cheap to construct, and to place in position.

It is evident that our gate operating mechanism may be used in connection with other things than bridges, as for instance it may be used in public halls and opera houses, and we do not restrict ourselves to its use in connection with bridges.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a gate operating mechanism, the combination with a series of gate sections, of a series of rotating disks, means for connecting said gate sections with said disks, so that by the rotation of said disks, said gate sections will be raised or lowered, locking latches, having their axes coincident with those of the rotating disks and engaging with the framework of the mechanism, for holding said gate sections either in their raised or lowered positions, and means connected with the bridge for unlocking said locking latches and thereupon causing the rotation of said disks, substantially as described.

2. In a gate operating mechanism, the combination with a series of gate sections, of a series of rotating disks, having formed around their circumferences a series of projecting lugs, and connected with said gate sections by links attached near their circumferences, of gear teeth placed on the bridge for engaging the said projecting lugs and causing the rotation of said disks, substantially as described.

3. In a gate operating mechanism, the combination with a series of gate sections, of a series of rotating disks having formed on their outer surfaces around their circumferences a series of projecting lugs, and connected with said gate sections by links attached near their circumferences, locking devices for holding said gate sections in their raised or lowered positions, and means placed on the bridge for unlocking said locking devices and thereupon rotating said disks, substantially as described.

4. In a gate operating mechanism, the combination with a series of gate sections, of a series of rotating disks, each of which is formed on its outer surface around its circumference with projecting lugs, and is connected to one of said gate sections by a link attached near its circumference, a locking-plate provided with a central slot through which the axis of the rotating disk passes, a pair of slots arranged on either side of said central slot, in each of which is pivoted a locking-dog whose side projecting arms engage with studs placed on the locking-plate, pointed ends to said plate, one of which engages with a locking socket formed in the frame work of the mechanism, and a section of gear teeth placed on the bridge for engaging with said locking dog, thus unlocking the locking device, and thereupon engaging the projecting lugs and causing the rotation of the disk, substantially as described.

5. In a gate operating mechanism, the combination with a series of gate sections, of a series of rotating disks, each of which is formed on its outer surface around its circumference with projecting lugs, a locking plate provided with a central slot through which the axis of the rotating disk passes, a pair of slots arranged on either side of said central slot, in each of which is pivoted a locking dog whose side projecting arms engage with studs placed on the locking plate, another pair of slots in which move pins formed integral with the rotating disk, pointed ends to said plate, one of which engages with a locking socket formed in the framework of the mechanism, a link connecting said disk and said gate section, and attached to said disk at a point in diametrical line with said slot-engaging lugs, and a series of gear teeth attached to the bridge for engaging with said locking dog, thereby unlocking the locking device, and thereupon engaging with the projecting lugs and causing the rotation of the disk, substantially as described.

6. In a gate operating mechanism, the combination with a series of gate sections having vertical guides, of a series of rotating disks having formed around their circumferences a series of projecting lugs, and connected with said gate sections by links attached near their circumferences, and gear teeth placed on the bridge for engaging the said projecting lugs and causing the rotation of said disks, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

BENEDIKT HABERTHUR.
JOSEPH MANDEL.

Witnesses:
JOS. WILER,
S. B. PATTERSON.