

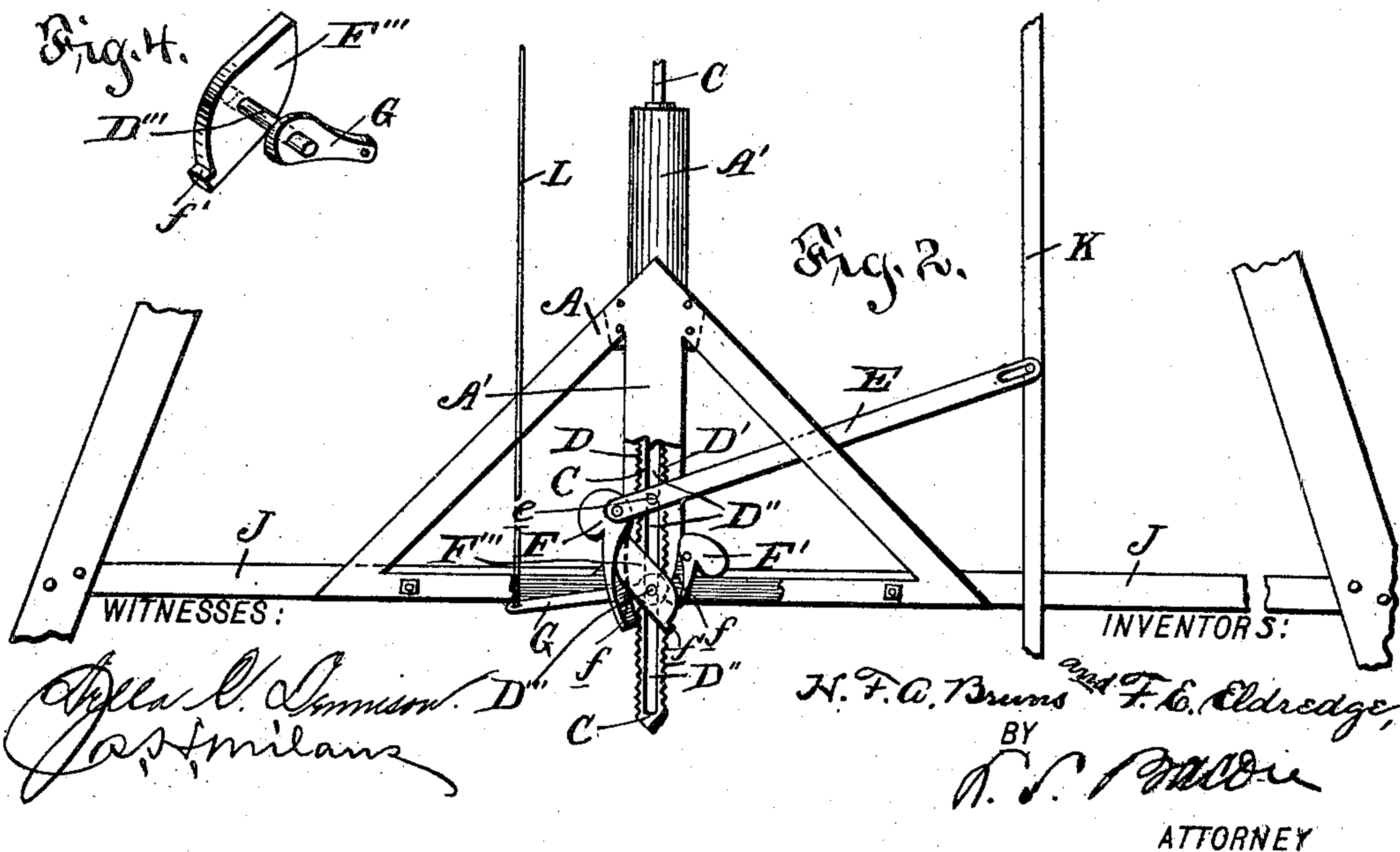
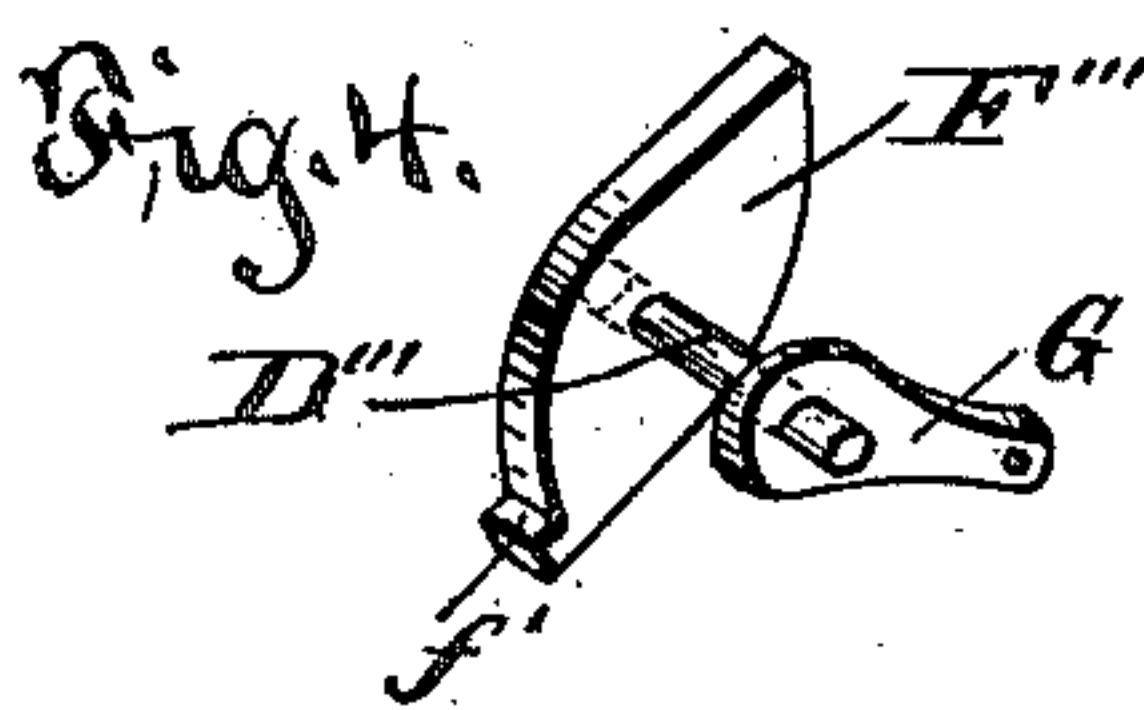
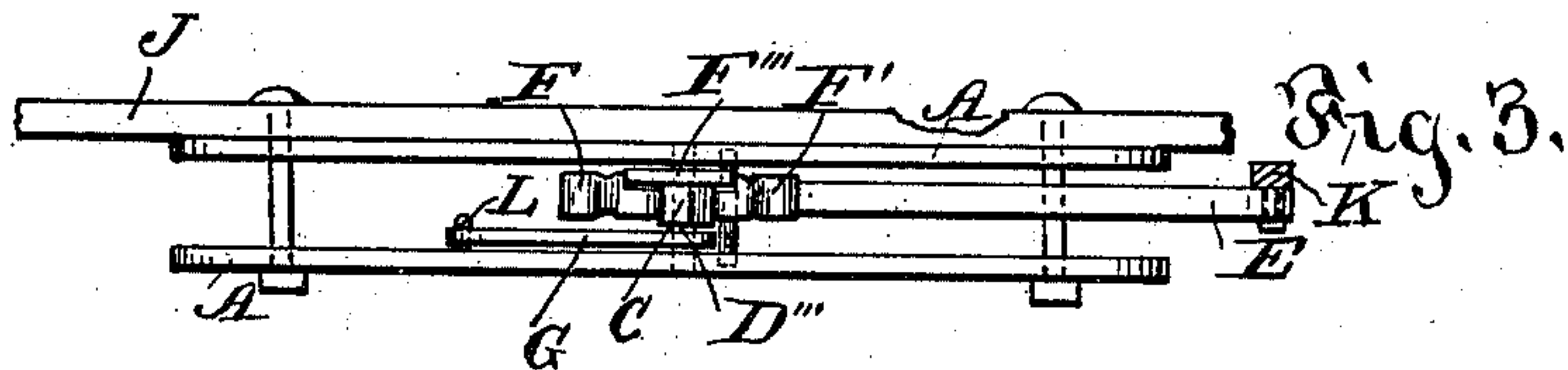
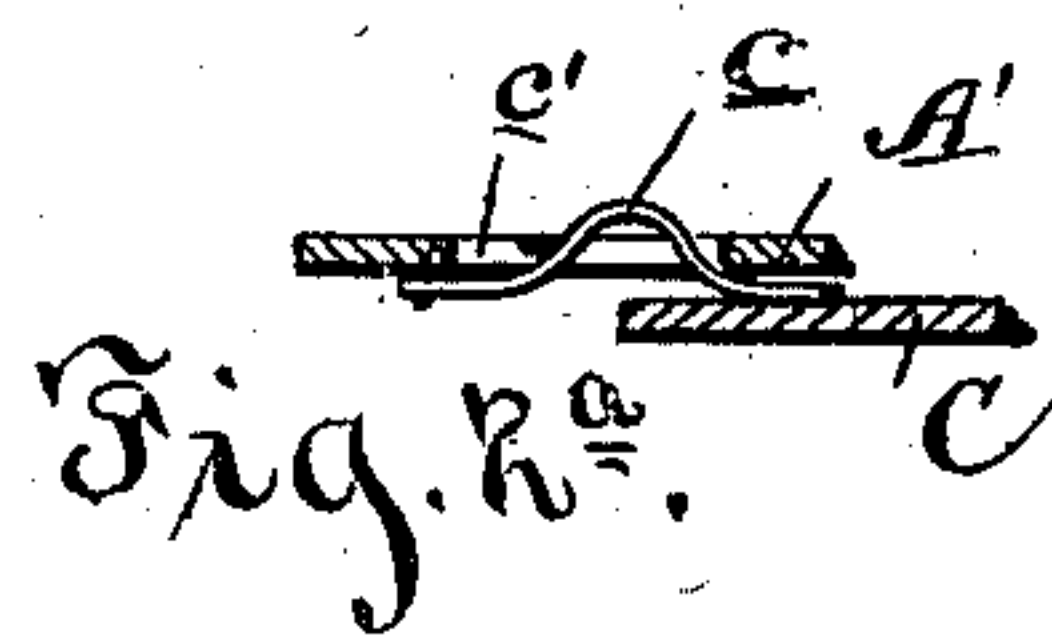
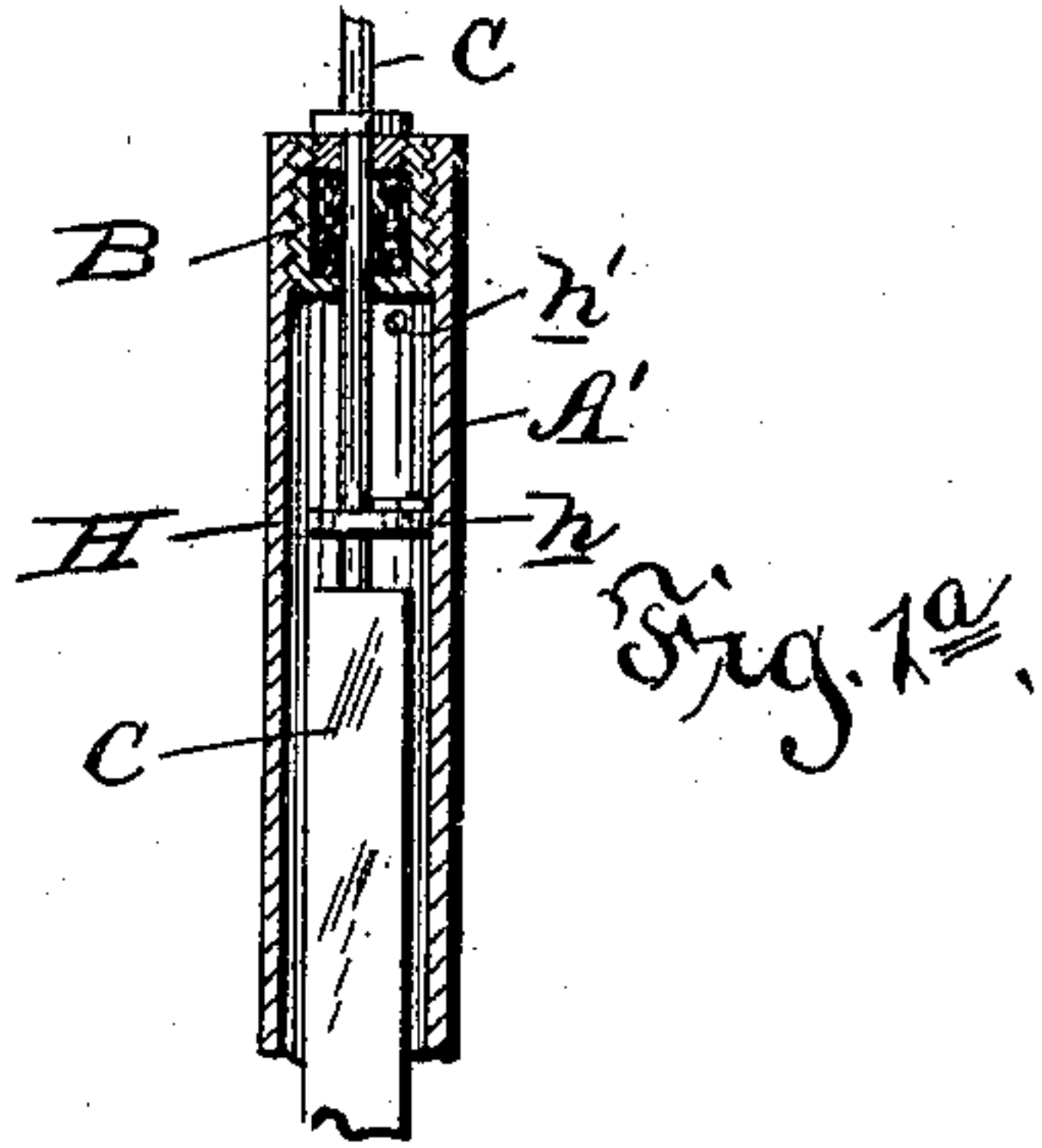
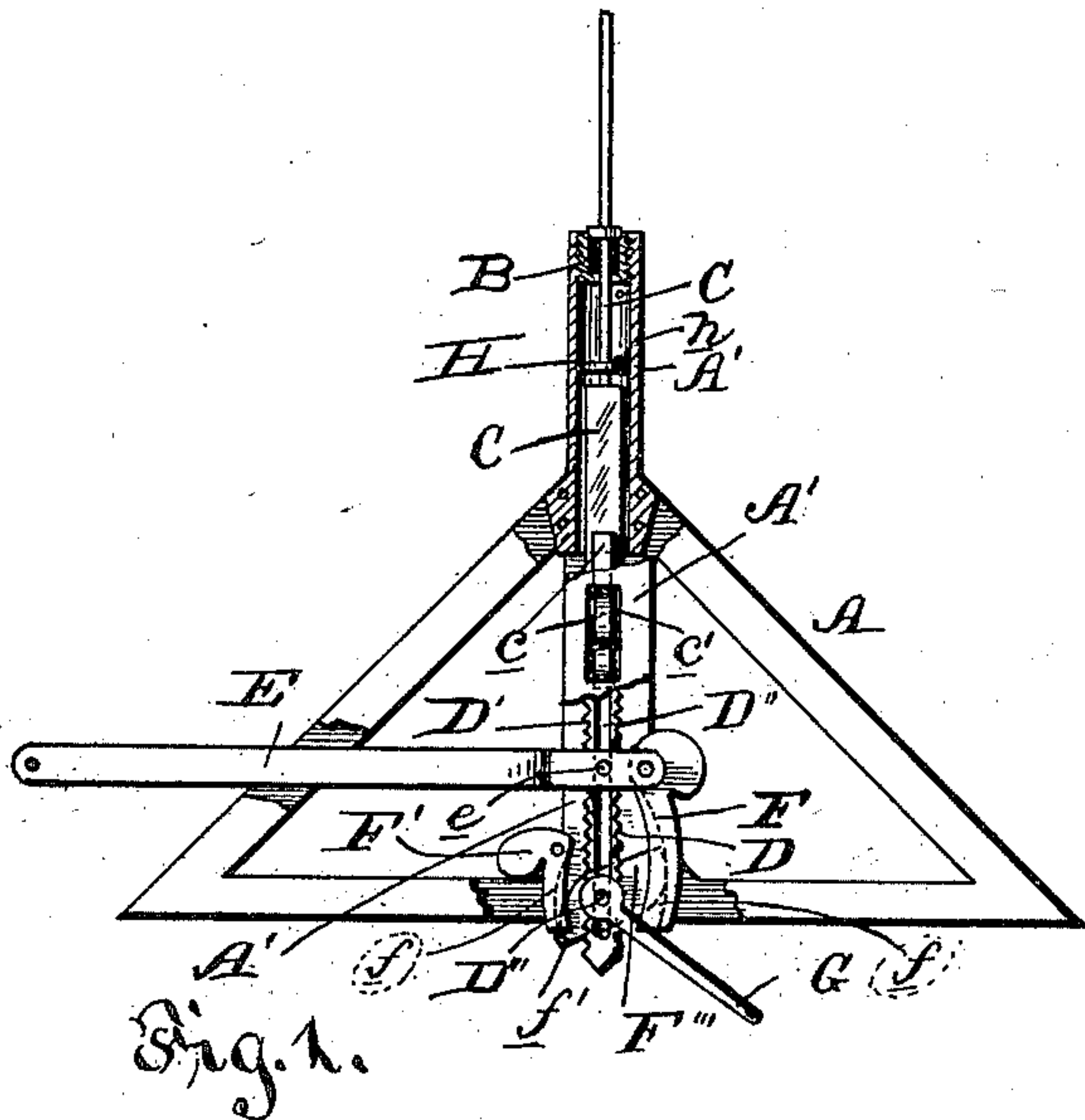
No. 646,950.

Patented Apr. 10, 1900.

H. F. A. BRUNS & F. E. ELDREDGE.  
AUTOMATIC WINDMILL REGULATOR.

(Application filed July 6, 1899.)

(No Model.)





# UNITED STATES PATENT OFFICE.

HENRY F. A. BRUNS AND FRANCIES E. ELDREDGE, OF WAVERLY, IOWA.

## AUTOMATIC WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 646,950, dated April 10, 1900.

Application filed July 6, 1899. Serial No. 722,928. (No model.)

*To all whom it may concern:*

Be it known that we, HENRY F. A. BRUNS and FRANCIES E. ELDREDGE, citizens of the United States, residing at Waverly, in the county of Bremer and State of Iowa, have invented certain new and useful Improvements in Automatic Windmill-Regulators; 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.

This invention relates to automatic windmill-regulators whereby a wind-wheel is thrown into and out of operation according as the water pumped into a receptacle for the purpose rises or falls to a certain level.

The general type of regulator to which the invention relates is that shown, for instance, in Patent No. 437,712, issued to L. E. Nelson October 7, 1890, which patent is hereby disclaimed.

An object of the invention is to provide a novel means for regulating the rise and fall of the operating-rod when throwing the wind-wheel into and out of the wind.

Another object of the invention is to afford a construction much simpler than the known forms of the prior art and to make a device which will at the same time be rigid, compact, and efficient in operation.

In the accompanying drawings, wherein, for the sake of illustration, an embodiment of the invention is delineated, like reference-letters designate corresponding parts in the several views.

Figure 1 is a front elevation of the regulator, showing parts of the forward bracket broken away sufficiently to illustrate the operating parts, the same being shown in the position they occupy when the wind-wheel is in the wind. Figs. 1<sup>a</sup> and 2<sup>a</sup> are detail views of portions of Fig. 1. Fig. 2 is a rear elevation of the regulator in proper position on the framework J of a mill-tower and showing the parts in their relative positions when the wheel is thrown out of the wind. Fig. 3 is a bottom plan view, and Fig. 4 is a detail perspective of the tripping-cam and its lever.

Referring to the drawings, A designates substantially-triangular supporting-brackets,

and A' vertical members thereof, adapted to be attached in any desirable manner to the ordinary framework of a windmill. From the upper portion, intermediate the brackets and rigidly secured thereto, projects an elongated cylinder, having at its upper end a stuffing-box B, through which works what we will hereinafter term the "operating-rod" C. This stuffing-box constitutes the main guide for the operating-rod and also serves to keep the same clean and free from corroding, so that the easy working thereof is always assured.

That the wheel may not be thrown into or out of operation too rapidly, so as to cause a jarring and consequent injury to the parts, we provide the following mechanism: Upon a reduced portion of the operating-rod, at a suitable position intermediate the ends of the cylinder, is a piston H, the same snugly fitting the wall of the cylinder and adapted to slide upon the same. A flap-valve h, opening upwardly, permits air to enter the cylinder above the piston when the same is descending, and to prevent an irregular or too rapid fall of the rod a flat spring c, Fig. 2<sup>a</sup>, is employed, the same being secured at one end to one of the vertical members A' of the bracket A and bent to extend into and be guided by a slot c' therein. The opposite end of the spring projects slightly into the lower end of the cylinder and bears against the surface of the operating-rod, thereby imparting to it the desired friction. It is the rapid ascent of the rod, however, which it is most desired to be avoided, and from the foregoing it will be readily understood that when the rod commences its upward movement the valve h in the piston will close, and the air in the cylinder above the same when compressing will have a cushioning effect and cause the rod to rise gradually. Should it be found desirable, a small exit-opening h' may be formed in the upper portion of the cylinder.

The lower end of the operating-bar is provided in its opposite edges with teeth or serrations D D' for purposes to be pointed out, and in the center thereof there is an elongated slot D'', working over a cross-pin D''' in the brackets, whereby excessive movement of the operating-rod is prevented.



Pivoted at *e* in the brackets is the lever E, which in turn connects with the pump-actuating rod K, leading from the mill and connected thereto in any suitable manner well known in the art. To the extreme inner end of this lever is hung the actuating-pawl F, weighted at its upper end so as to normally engage the teeth D of the bar C. To the left of the bar C and correspondingly weighted so as to normally engage the teeth D' thereof a retaining-pawl F' is pivoted in the brackets.

Now it will be observed that when a tank is full and the wheel is to be thrown out of the wind the parts will be in the relative positions shown in Fig. 2—that is, with the pawls in engagement with the respective sets of teeth on the operating-rod. The pump-rod working up and down will give a like movement to the lever E, and consequently the pawl F will draw the operating-rod downward, and the pawl F' will retain the same in such downward position until released by the mechanism to be now described.

Rigidly attached to the cross-pin D'', which is revoluble in its bearings, is the lever G, which is connected by any suitable cords or links L to a float in the tank into which water is designed to be pumped. Also rigidly secured to the cross-pin in the rear of the operating-rod is a double-faced cam F''', (clearly shown in perspective in Fig. 4,) which cam from the nature of its action will be referred to as the "releasing-cam" or "spacing-block."

This cam is adapted to engage the offset or shouldered portions *f* of the pawls (best seen in Fig. 3) and has the projecting stop *f'* at its lower corner, which contacts with the bottom of the pawl F' to limit the movement of the cam. It will therefore be obvious that when the windmill is being thrown out of the wind, the lever G will be raised by the rising of the float, the cam turned in the position shown in Fig. 2, out of engagement with the pawl, and the pawls thereby permitted to operate upon the racks of the operating-rod. On the other hand, when the water becomes low in the tank, the float and lever G will descend, and the cam turned to the position shown in Fig. 1, when the pawls will be spread apart out of engagement with the operating-rod, and the rod therefore permitted to ascend and throw the wheel into the wind.

While we have described and shown herein a particular construction for carrying out our ideas, yet it is to be understood that many details in the construction and arrangement of parts may be made without departing from the nature and principle of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a windmill-regulator, the combination with suitable supporting-brackets, of a slotted operating-rod having toothed edges, a pin working in the slot of the rod to guide the same, a lever pivoted in the brackets adapted

to be connected to a pump-rod, an actuating-pawl carried at the end of the lever, a retaining-pawl pivoted in the brackets, both pawls normally engaging the operating-rod, and means for separating the pawls, substantially as described.

2. In a windmill-regulator, the combination with suitable supporting-brackets, of an operating-rod, pawls, means for operating the rod when the pawls are in engagement therewith, and means for separating the pawls comprising a pivoted double-faced cam, and means for turning the same, substantially as described.

3. In a windmill-regulator, the combination with suitable supporting-brackets, of an operating-rod, means for engaging the rod to draw the same downward, a cam or spacing-block engaging said means to force the same out of engagement with the operating-rod, and a stop on the cam or spacing-block for limiting the turning movement thereof, substantially as described.

4. In a windmill-regulator, the combination with suitable supporting-brackets, of an operating toothed rod, pawls engaging said rod adapted normally to draw the rod downwardly, and means for forcing said pawls out of engagement with the rod, comprising a double-faced cam, offset portions on the respective pawls adapted to be engaged by the cam, and means for turning the same, substantially as described.

5. In a windmill-regulator, the combination with suitable supporting-brackets, of an operating-rod having an elongated slot therein, actuating means for the rod, a spacing-block for forcing said means out of operative position, and a cross-pin serving as a pivot for the spacing-block and also as a stop over which the slotted rod works and is limited in its movement, substantially as described.

6. In a windmill-regulator, the combination with suitable supporting-brackets, a cushioning-cylinder thereon, means for throwing the wheel into and out of the wind, an operating-rod connected to said means and passing through the cylinder, and a piston on said rod, operating substantially as and for the purpose described.

7. In combination with a windmill-regulator, having suitable supporting-brackets and means for throwing the wheel into and out of the wind, of a rod, and an air-cushion interposed between said means and rod and operating substantially for the purpose described.

8. In combination with a windmill-regulator having suitable supporting-brackets and means for throwing the wheel into and out of the wind, of a cushioning-cylinder connected with said means, a piston in said cylinder, an operating-rod connected to the piston, and a valve in the piston, substantially as and for the purpose described.

9. In a windmill-regulator, the combination with suitable supporting-brackets, of an



operating-rod toothed on opposite faces, pawls  
arranged respectively to engage the toothed  
faces of the rod and adapted normally to force  
the same downwardly, a double-faced cam or  
5 spacing-block, adapted to force the pawls out  
of engagement with the rod, and means for  
limiting the turning movement of said cam,  
substantially as described.

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

HENRY F. A. BRUNS.

FRANCIES E. ELDREDGE.

Witnesses:

J. Y. HAZLETT,

J. RUDDICK.