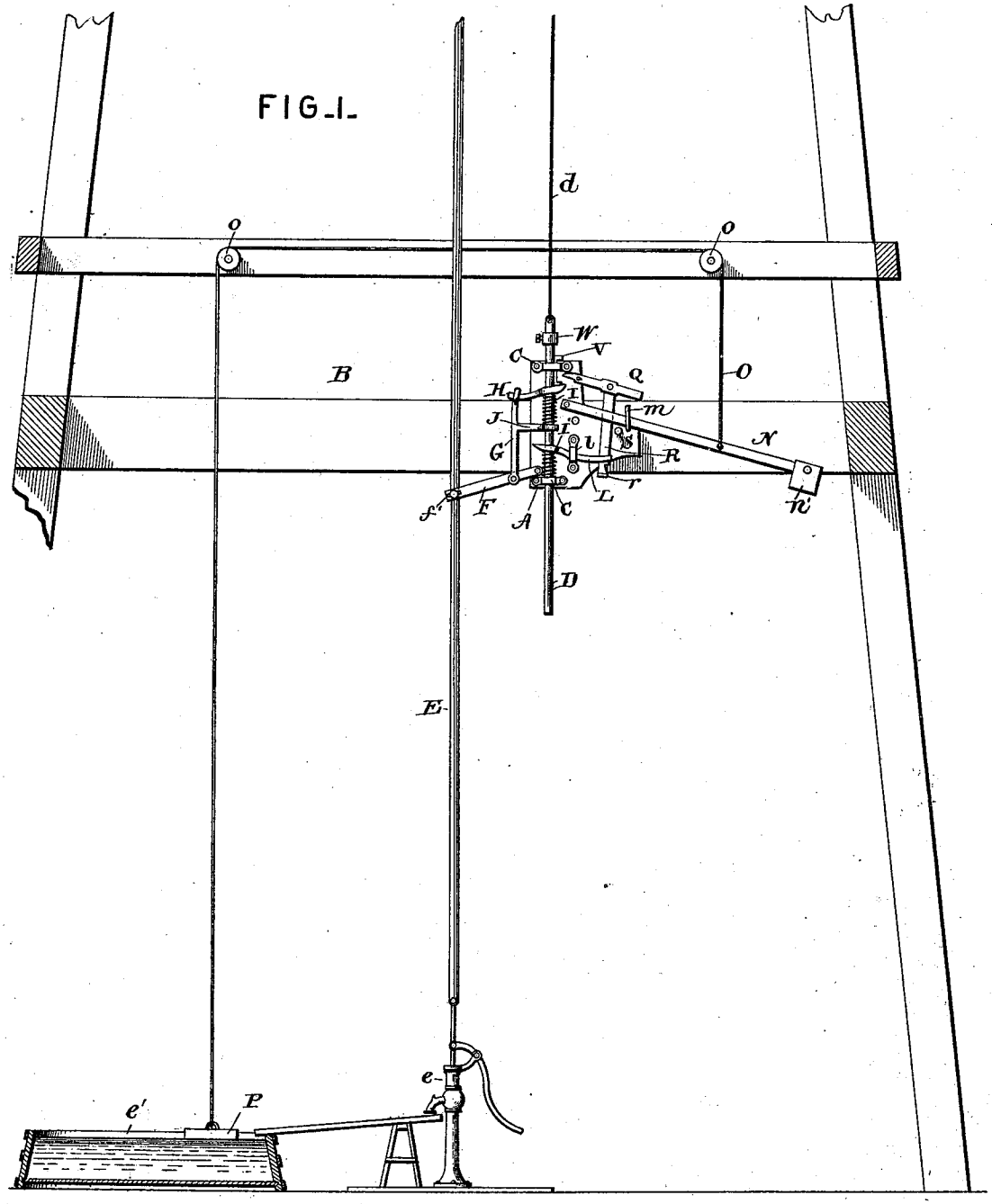
(No Model.) 3 Sheets—Sheet 1.

T. J. ADAMS.

AUTOMATIC WINDMILL REGULATOR.

No. 510,627. Patented Dec. 12, 1893.

FIG. 1.



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(No Model.) 3 Sheets—Sheet 2.

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FIG. 2.

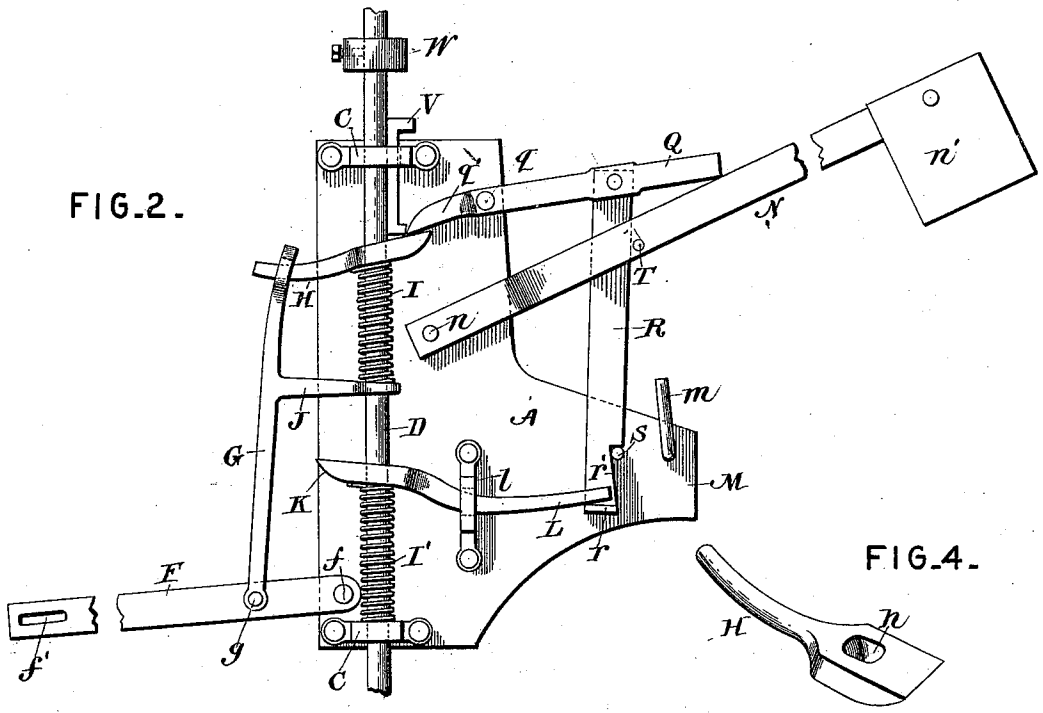

FIG. 4.

FIG. 3.

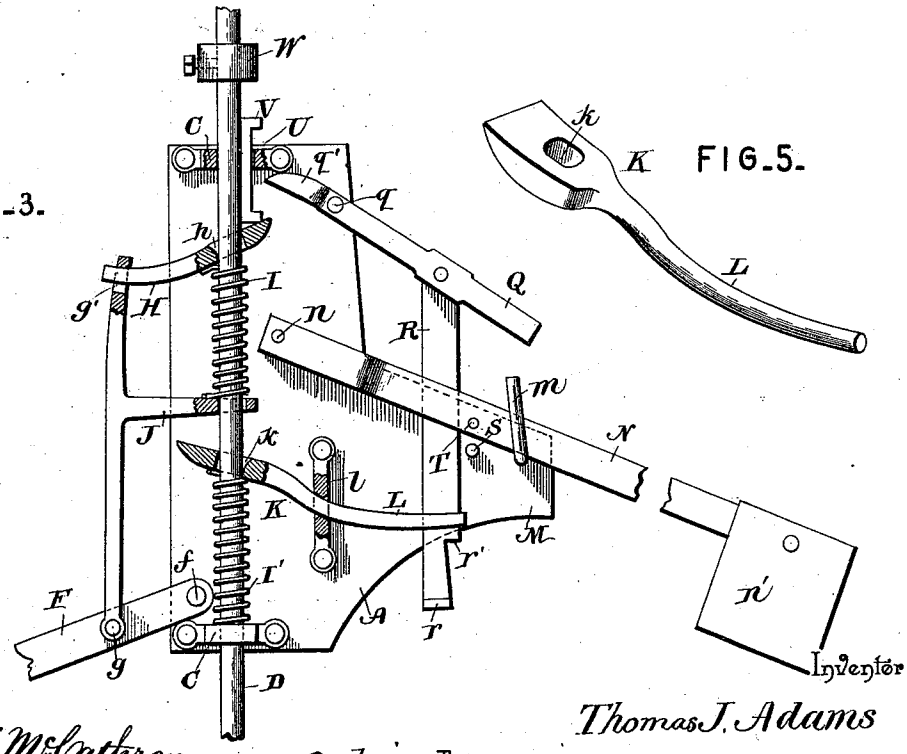

FIG. 5.

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FIG. 6.

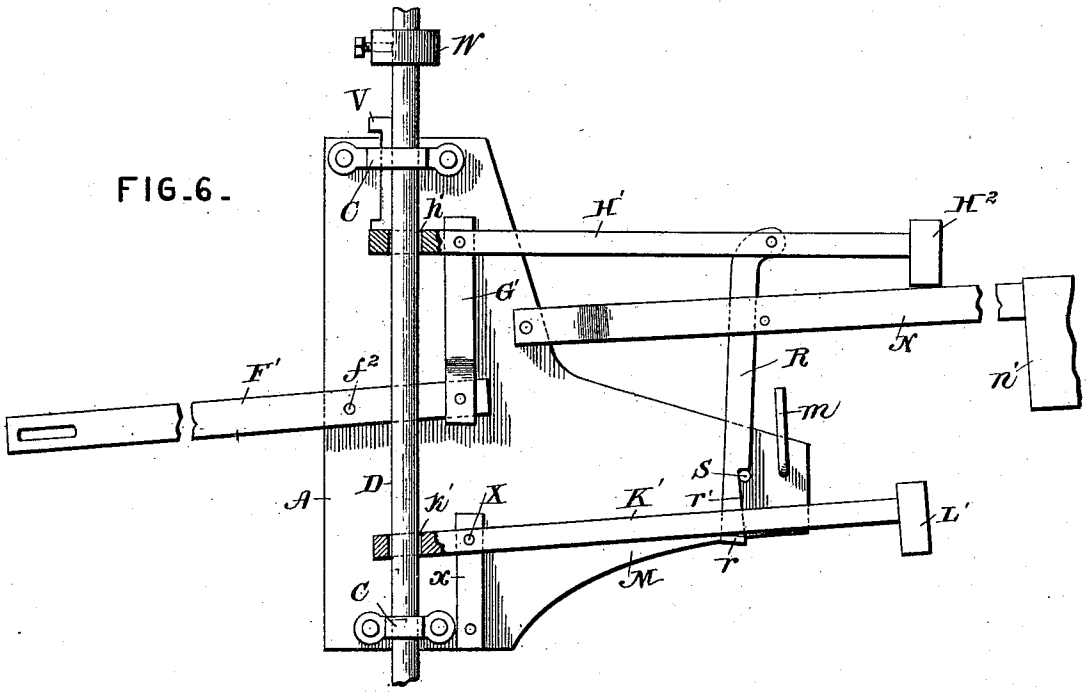
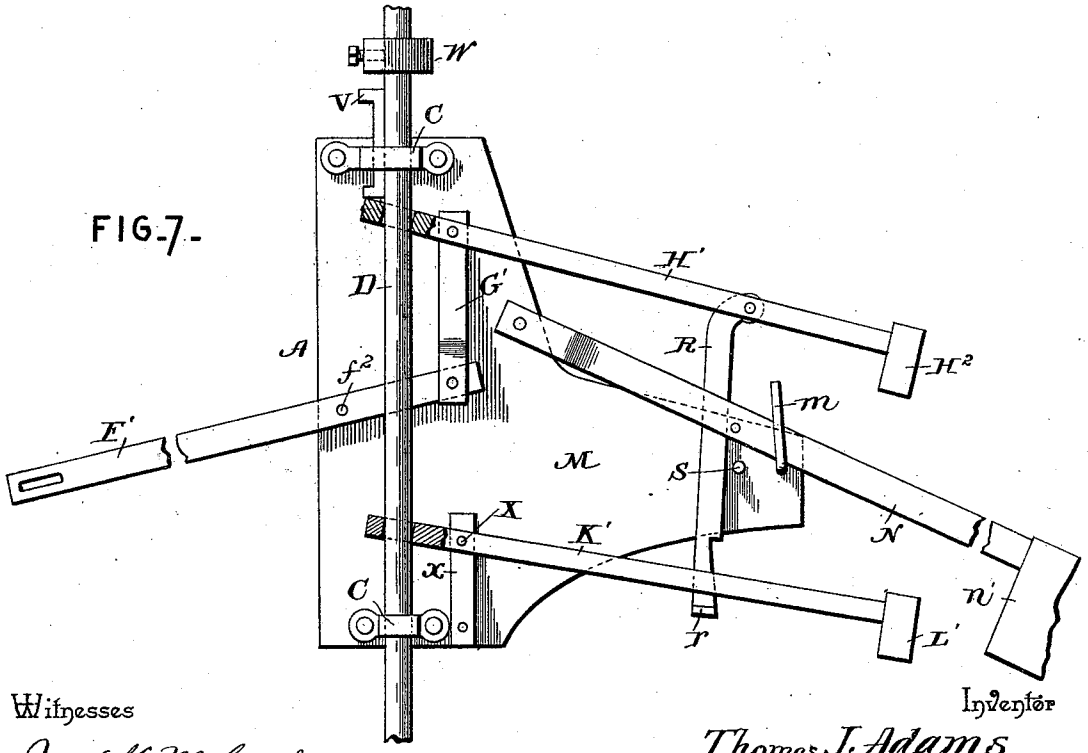


FIG. 7.



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UNITED STATES PATENT OFFICE.

THOMAS J. ADAMS, OF AURORA, NEBRASKA.

AUTOMATIC WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 510,627, dated December 12, 1893.

Application filed April 3, 1893. Serial No. 468,930. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. ADAMS, a citizen of the United States, residing at Aurora, in the county of Hamilton and State of Nebraska, have invented a new and useful Automatic Windmill-Regulator, of which the following is a specification.

This invention relates to automatic wind mill regulators; and it has for its object to provide certain improvements in machines of this character whereby the wind mill can be accurately regulated to be thrown in and out of gear as may be required, according to the quantity of water on hand in the ordinary wind mill tank.

To this end the main and primary object of the invention is to provide certain improvements in the mechanism of automatic wind mill regulators whereby the use of the same shall be rendered more practical and efficient.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts, hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is an elevation partly in section of the lower end of a wind mill tower showing my improved automatic regulator in operative position therein. Fig. 2 is a front elevation of the regulator showing the parts in position during pumping while the wind mill is in gear. Fig. 3 is a similar view of the regulator, the parts thereof being in a position when the wind mill is out of gear. Figs. 4 and 5 are details in perspective of the upper clutch dog and the lower check dog. Fig. 6 is a front elevation of a modification of the regulator showing the parts in position when the mill is out of gear. Fig. 7 is a similar view showing the parts in position during pumping while the mill is in gear.

Referring to the accompanying drawings, A represents an attachment plate adapted to be secured in position within the lower end of a wind mill tower B, as illustrated in Fig. 1 of the drawings. The said attachment plate A, has secured to the upper and lower ends thereof the perforated guide lugs C, through which is designed to move the regulator rod D, connected at its upper end by the wire *d*, to the devices for throwing the wind mill in and out of gear. When the regulator rod D, is freed from the lowering devices therefor, the same is drawn up through the guides of the attachment plate to its full upper limit so as to allow the wind mill to go into gear, and through the medium of the pump rod E, to operate the pump *e*, and pump the required amount of water into the tank *e'*. The pump rod E, during the reciprocations thereof is designed to actuate the pump rod lever F. The pump rod lever F, is pivoted at one end *f*, to the attachment plate A, and has an opposite slotted end *f'*, attached to the pump rod. A clutch dog lever G, is pivoted at its lower end at *g*, to the pump rod lever F, near its attachment to the attachment plate, and is provided with an enlarged perforation or opening *g'*, at its upper end which is designed to loosely receive the rounded end of the upper clutch dog H. The upper clutch dog H, is provided with an enlarged clutch opening *h*, therein, which loosely embraces the regulator rod D, but is normally cramped or bound thereon by means of the upper dog spring I. The upper dog spring I, is coiled over the rod D, under the upper dog H, and is held in position by means of the intermediate off-standing perforated spring supporting arm J, embracing the rod D, and extending laterally from the lever G, intermediate of its ends. Now it will be readily seen that when the wind mill is in gear, as the pump rod reciprocates, a lever motion will be transmitted to the upper dog, and if the same is loosened from the regulator rod against the tension of the spring I, the pumping proceeds until the requisite amount of water has been pumped, as will be hereinafter described, and when this occurs, it is designed to allow the dog H, to grip the regulator rod by reason of the spring pressure, so that as the pumping further continues, the upper dog will alternately release itself of the regulator rod, and slip up the same to gain a grip, which draws the regulator rod down, so as to throw the wind mill out of gear. As the upper clutch dog H, alternately slides on and grips the regulator rod, it is necessary to hold the rod while the upper dog is gaining a new grip, so that there

will be no loss of motion or slipping of the rod, and in order to secure this result I employ a lower check dog K. The lower check dog K, is of the same general construction as the upper dog having at one end an enlarged clutch opening or perforation *k*, which is normally cramped onto the regulator rod by reason of the lower dog spring I′, bearing under the clutch end of the check dog and supported on the lower one of the perforated guide lugs C. The lower check dog K, is provided with an extended shank L, which loosely works in the perforated fulcrum lug *l*, secured to the face of the attachment plate so as to provide a pivot or fulcrum for the lower check dog to allow the same to be thrown out of its normal engagement with the regulator rod.

The attachment plate A, is provided with an extended side portion M, to which is secured the off-standing guide arm *m*, which forms a guide and support for the weighted float lever N. The weighted float lever N, is pivoted at its inner end *n*, to the attachment plate A and carries at its other end a weight *n′*. A float wire or cord O is connected to the lever N, near its weighted end and passing over suitably arranged pulleys *o*, is attached at its other end to the float P, floated on the water in the tank *e′*. When the water in the tank lowers and needs replenishing, the float draws down on the wire or cord O, and lifts up the lever N. As the lever rises, the same rides under the outer end of the upper dog releasing lever Q. The upper dog releasing lever Q, is pivoted at *q*, to the attachment plate, and has a flattened end *q′*, adapted to work onto the clutch end of the upper clutch dog H. A lifting arm R, is pivoted at its upper end to the lever Q, near its outer end, and has a lower flanged end *r*, adapted to work under the extended shank of the lower check dog, and is further provided near the lower flanged end thereof with a catch shoulder *r′*, adapted to be lifted onto the catch pin S, projecting out from the plate A. Now proceeding with the operation, it will be apparent that as the float lever is brought under the releasing lever Q, the said releasing lever will draw up the arm R, and lift one end of the lower check dog. This movement causes a simultaneous releasement of both dogs from the regulator rod, so that the same can fly up to its extended position and allow the wind mill to go into gear so that the pumping may start. This operation also lifts the shoulder of the arm R, onto the the pin S, so as to hold the lower check pawl out of engagement with the regulator rod, and also to hold the lever Q, in a position to prevent the upper clutch dog from drawing down the regulator rod. When the water in the tank has risen sufficiently high, the weighted float lever will have lowered by that time sufficiently, so that the disengaging stud or pin T, projecting from one side thereof, will come in contact with one edge of the arm R, and shove the same out of engagement with the pin S, thus allowing the dog springs to immediately throw the same into engagement with the regulator rod, so that as the pumping continues the rod will be drawn down until the mill has been thrown out of gear and the pumping stopped. The upper perforated guide lug C, is further provided with a notch or slot U, leading in from the perforation in the lug, so as to loosely receive the flanged key or pin V, adapted to work alongside of the regulator rod moving through said upper guide lug. The regulator rod carries an adjustable collar W, adapted to work onto the upper end of the key V, so as to force the lower end of the same against the clutch end of the upper clutch dog H, and to release the same from the regulator rod at the proper time. The function of this key will be clear in that it is well known that in a hard wind the wind mill will run even when not in gear. The said key V, is loose in the upper guide, and does not interfere with the free movement of the regulator rod, but when the rod is pulled down until the collar engages said key, the upper dog will be loosened from the rod so that the regulator will not be strained or broken.

As illustrated in Figs. 6 and 7 a modification of the construction disclosed in the other figures is observed, which operates in substantially the same manner and embodies the same principle, the essential difference being in the dispensing with the use of the springs I and I′. In these figures of the drawings, the pump rod lever, designated as F′, is pivoted at f^2, to the attachment plate A, and has pivotally attached to the inner end thereof the lower end of the link G′, corresponding to the dog lever G, and pivotally connected at its other end to the upper weighted clutch dog H′. The upper weighted clutch dog H′, is provided at one end with an enlarged clutch opening *h′*, so that the upper clutch dog H′, will operate in substantially the same manner as the dog H, previously described. The dog H′ is elongated and carries at its other end the weight H^2, which serves to normally throw the clutch opening onto the regulator rod.

It will be obvious that the operation of the lever clutch dog H′, is the same as that hereinbefore described relative to the clutch dog H, and in connection with said upper clutch dog is employed an elongated weighted lower check dog K′, corresponding to the dog K, previously described. The check dog K′, is pivoted at X to the strap *x*, secured to the attachment plate J, and is provided at one end with an enlarged clutch opening or perforation *k′*, which is normally clamped onto the regulator rod D, by reason of the weight L′, at the other extremity of the dog K′.

The weighted float lever N, in the modification shown in Figs. 6 and 7, is attached to the attachment plate as previously described, but, as the same rises, it is adapted to ride under the weighted end of the upper clutch

dog H′, so as to loosen the clutch end of the same from the regulator rod, as is clearly seen in Fig. 6 of the drawings, and when the upper clutch dog H′, is lifted by the float lever, the same lifts up the lifting arm R, into engagement with the pin S, as previously set forth. The lifting arm R, is pivotally attached at its upper end to the dog H′, and has its lower flanged end working under the lower check dog K′, so as to simultaneously lift the same with the dog H′, to release the regulator rod and to allow the mill to go into gear when the water in the tank lowers. When the water in the tank rises, the weighted float lever drops and knocks the lifting arm R, off of its catch, and allows the weighted ends of the two dogs to fall, and thereby cramp their other ends onto the regulator rod. It is thought that the construction and operation of the modification just described, will be readily apparent without further description.

Other changes in the form, proportion and the minor details of construction as embraced within the scope of the appended claims, may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a wind mill regulator, the attachment plate having guides a vertically movable regulator rod, mounted to slide through said guides, an upper spring-pressed clutch dog normally gripping the rod, a pump rod lever pivoted on the attachment plate, a dog lever pivoted at one end to the rod lever and connected at its other end to the upper dog, a spring-pressed check dog embracing and normally gripping the rod below the upper check dog, and means for simultaneously and automatically releasing both dogs from the rod and allowing the same to resume their normal positions, substantially as set forth.

2. In a wind mill regulator, the stationary attachment plate having upper and lower guide lugs, a regulator rod adapted to slide in said guide lugs, an upper spring pressed clutch dog embracing said rod and normally gripping the same, a pump rod lever pivoted to the attachment plate, a dog lever pivoted at its lower end to said rod lever and loosely connected at its upper end to the upper dog, a spring pressed check dog pivotally supported on the stationary attachment plate and embracing and normally gripping the rod below the upper clutch dog, independent connected releasing devices mounted on the attachment plate and adapted to simultaneously operate both dogs to make the same active and inactive, and a float actuated lever for controlling said releasing devices, said lever being pivoted at one end to the stationary attachment plate substantially as set forth.

3. In a wind mill regulator, the combination of the stationary guide lugs, a vertically sliding regulator rod, sliding through said lugs an upper clutch dog having an enlarged clutch opening embracing the rod, a swinging pump rod lever, a clutch dog lever pivoted at one end to said pump rod lever and having an upper perforated end *g* loosely receiving one end of the upper clutch dog, and an intermediate off-standing spring supported arm provided with an outer perforated end loosely embracing the rod, a spring supported on top of said arm and normally bearing under the upper clutch dog to normally hold the same in engagement with the regulator rod, a lower check dog for the rod, a spring supported on the lower guide lugs and bearing under the lower dog and means for simultaneously and automatically releasing the dogs from the rod, substantially as set forth.

4. In a wind mill regulator, the attachment plate having perforated guide lugs, an upper spring pressed lever controlled clutch dog embracing and normally gripping the regulator rod, a suitably arranged fulcrum lug, a lower spring-pressed check dog embracing and normally gripping the regulator rod and having an extended shank working in said fulcrum lug, a releasing lever pivoted to said attachment plate and adapted to have one end work onto the upper dog, a catch pin projecting from the attachment plate, a flanged lifting arm pivoted to said releasing lever and working under the shank of the check dog and having a catch shoulder adapted to be lifted onto said catch pin, and a float actuated lever pivoted to the attachment plate and adapted to bear under the releasing lever, said float actuated lever being provided with a projecting stud or pin adapted to throw the lifting arm off of said catch pin, substantially as set forth.

5. In a wind mill regulator, the combination of an attachment plate having perforated guide lugs, one of which is further provided with a notch leading from the perforation therein, a regulator rod sliding through said lugs, clutch dogs embracing and normally gripping the rod, means for actuating said dogs, a key loosely fitting the notch of one of said guide lugs, and an adjustable collar mounted on the upper end of the regulator rod and adapted to work onto said key to force the same onto the uppermost of said clutch dogs, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS J. ADAMS.

Witnesses:
B. M. YOUNG,
C. H. CLIFFORD.