(No Model.)

H. B. NIEBEL.

WINDMILL REGULATOR.

No. 459,333. Patented Sept. 8, 1891.

Fig. 2.

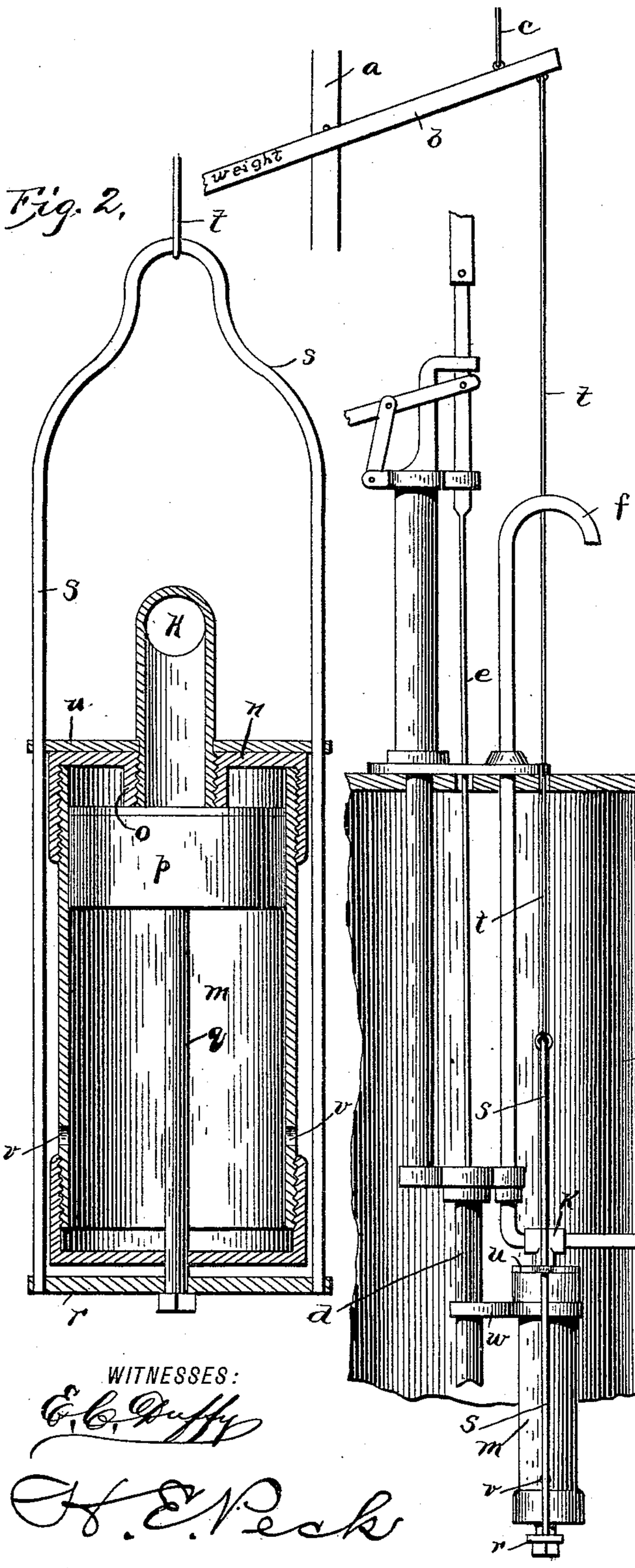
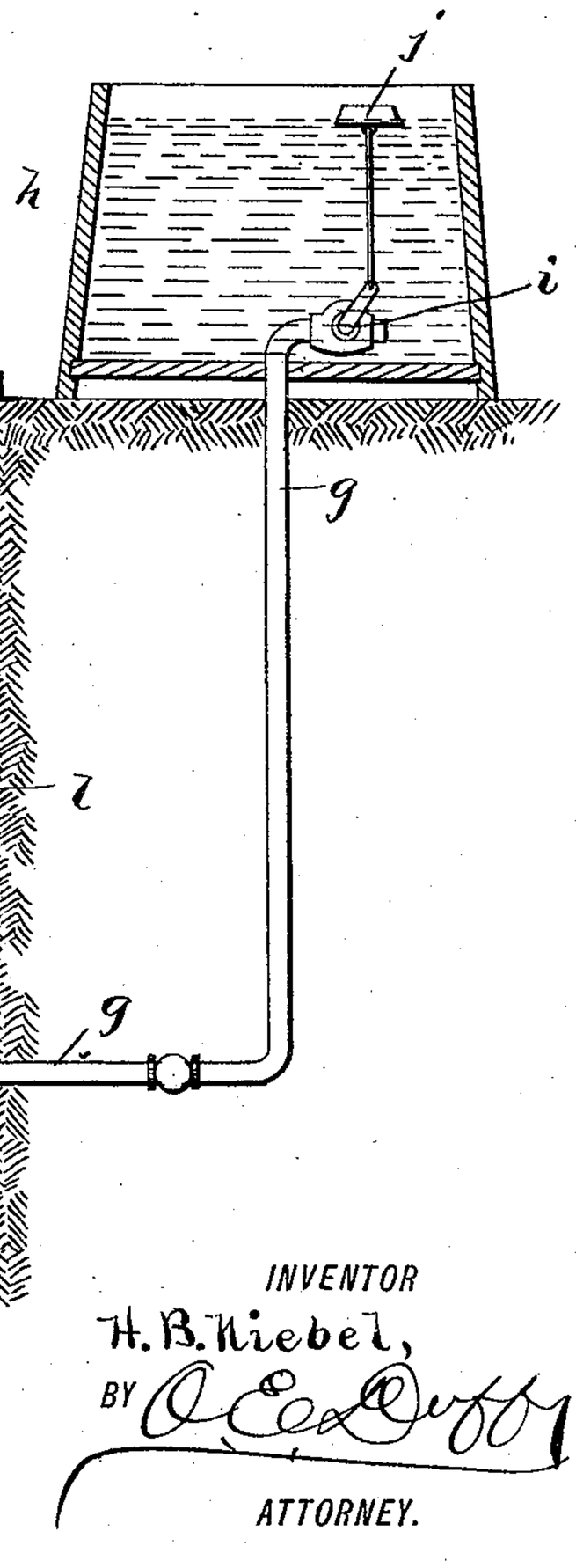


Fig. 1.



WITNESSES:

E. C. Duffy

H. E. Peck

INVENTOR

H. B. Niebel,

BY E. C. Duffy

ATTORNEY.

UNITED STATES PATENT OFFICE.

HENRY B. NIEBEL, OF BAIRDSTOWN, OHIO.

WINDMILL-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 459,333, dated September 8, 1891.

Application filed July 7, 1891. Serial No. 398,652. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. NIEBEL, of Bairdstown, in the county of Wood and State of Ohio, have invented certain new and useful Improvements in Windmill-Regulators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in windmill-regulators, more particularly to improvements in regulators for pumps.

Great damage to windmills and parts and connections thereof is often occasioned by breakage of the wire or other connection, which throws the mill out of gear, and by the wheel and pump continuing to operate after the tank has been filled and the pipe thereinto closed, for as the discharge from the pump is closed of course something has to give way when the pump continues to operate under heavy pressure. Furthermore, even if the connection which throws the mill out of gear does not break and is controlled by the hydraulic regulators now in use great damage is often done to the pipe or parts of the mill by the sudden closing of the outlet into the tank from the pump when it is throwing a heavy head of water and the pump and mill are operating very rapidly, for even if the mill is immediately drawn out of gear the heavy head of water suddenly stopped will cause the pipe or cylinder to break or give somewhere.

The object of my invention is to provide an improved hydraulic regulator for windmill-pumps, connected to throw the mill out of gear when the discharge into the tank is closed, and which is exceedingly simple, cheap, and durable in construction and composed of a minimum number of parts and is so constructed as to give an outlet or escape for the water from the pump if the connection to throw the windmill out of gear is broken and the pump continues to work.

These objects are accomplished by and this invention consists in certain novel features of construction and in combinations of parts more fully described hereinafter, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a view showing the receiving-tank and well in sections, and also showing a counterweighted lever connected to throw the mill in and out of gear, portions being broken away to show only such portions of the construction of the windmill and its pump as appertain to my invention. Fig. 2 is an enlarged section of the hydraulic regulator.

In the drawings, *a* indicates a portion of the windmill-tower.

b indicates the counterweighted lever, at one end connected by wire or other connections *c* with mill to throw the same out of gear.

d indicates any suitable pump having its piston-rod *e* connected with and operated by the wind-wheel. *f* indicates an outlet above the well from said pump, and *g* indicates a pipe extending from the pump upwardly into the bottom of the receiving-tank *h*. The upper end of this pipe *g* within the tank is provided with a suitable turn-plug or other valve having the lateral controlling-arm *i*, and this arm is connected to a float *j*, which controls the valve, so that the valve will always remain open until the water reaches a certain level in the tank, when the float will swing up the arm and close the valve, thereby preventing water being discharged into the tank through the pipe *g* from the pump when the tank is filled. When this valve in the discharge end of the pipe *g* is closed, the pump should stop operating or else the water will have to be discharged through some other channel.

To automatically stop the operation of the pump or to provide an escape for the water if the pump continues to operate when the valve in the discharge end of pipe *g* has been closed, I provide the following construction: *k* is a T-coupling located in the pipe *g*, preferably within the well or cistern *l*. A vertical cylinder *m* depends from the vertical portion of this T-coupling. This cylinder at its upper end is closed by head *n*, preferably screwed onto the cylinder and having central internal depending flange *o*, screw-threaded

at its inner side to receive the lower end of the coupling *k*, which is secured thereinto and opens into the cylinder. The lower end of this flange *o* also forms a seat for the upper face of the piston *p*, which snugly fits within the cylinder *m* and the piston-rod *q* of which extends downwardly through the lower head of the cylinder, and is there rigidly secured to a transverse head *r*, to the outer ends of which the frame *s* at its lower ends is secured and which extends upwardly at the exterior of the cylinder *m* a suitable distance above said cylinder. The upper end of this frame *s* is connected to the free end of the counterweighted lever *b* by means of the suitable wire or other connections *t*. A suitable bracket *u* is clamped between the coupling *k* and upper head of the cylinder *m* and has perforated ends projecting beyond the sides of the cylinder, through which the sides of the frame *s* loosely work and are guided thereby. The length of the frame *s* is such that the piston *p* can move the entire length of its cylinder without the upper end of the frame engaging the top of the coupling *k*.

The cylinder *m*, near the lower end thereof, is provided with discharge ports or passages *v* through its sides, as shown. These ports are such a distance above the lower head of the cylinder *m* that when the piston *p* is at its limit of downward movement the contents of the cylinder *m* can be freely discharged through said apertures *v*.

The cylinder *m* can be suitably braced and secured, and when located as shown in the drawings it is suitably secured to a piston-rod by braces *w*. However, it is evident that the regulating-cylinder and piston can be located where desired, so as to be in communication with the pump and so that the pressure of the water when shut off in pipe *g* will be exerted on the piston *p*. When the pipe *g* is open and the mill in operation, the pump forces the water freely through the pipe *g* into the tank *h*, the water flowing through the coupling *k*, the lower outlet of which is tightly closed by the piston *p*, pressing up against flange *o*, the piston being firmly held in this position by means of the counterbalanced lever *b*, the connections *t*, frame *s*, and the piston-rod. When the tank *h* is filled, the float *j* closes the valve in pipe *g*, and should the pump continue to operate something would have to give or break unless an outlet for the water is provided or the mill thrown out of gear. When the pipe *g* is closed, the pressure of the water presses down the piston *p*, and thereby forces down the frame *s* and throws the mill out of gear through connections *t* and *c* and lever *b*, and should the pressure of water be slight the mill will be thrown out of gear without the piston *p* descending its full stroke; but should the head and pressure of water be very heavy the piston *p* will descend its full stroke, thereby permitting excess of water to escape through aperture *v* and prevent bursting of pipes or breaking of cylinder, as is ordinarily the case where an escape for the water is not provided. Should any of the wires or connections which throw the mill out of gear break, as they very often do, the wind-wheel will continue to rotate and operate the pump, irrespective of the amount of water in the tank *h* or whether or not pipe *g* be closed. Such being the case, the movements of the piston *p* will not throw the mill out of gear; but as soon as the pipe *g* is closed the piston *p* will descend its full stroke, permitting the water to freely discharge through the apertures *v*, thereby preventing rupture of pipes or connection or breakage of the mill.

Heretofore hydraulic regulators of this class have been provided in which the piston passed directly through the upper head of the cylinder, and the water was also discharged into the upper end of the cylinder, thereby necessitating a packing joint or box, the use of which in such a locality possesses many disadvantages, as they are expensive and leak and are very difficult to keep in order. I obviate the use of such a device by carrying my piston down through the lower head of the cylinder and providing the exterior frame, so that a tight joint is not necessary where the piston-rod passes through the lower head of the cylinder.

It is evident that my invention is very simple, cheap, and durable, and is composed of a minimum number of parts, and is of the greatest utility and advantage. It is also obvious that various slight changes might be made in the form, arrangement, and constructions of the parts herein described without departing from the spirit and scope of my invention. Hence I do not limit myself to the construction herein set forth; but

What I claim is—

1. The combination of a pump, a receiving-tank, the passage from the pump to said tank, the valve to close said passage into the tank, the regulating-cylinder having the opening in its upper end from said passage, the piston in said cylinder normally closing the opening into the cylinder and connected with the operating means of the pump to throw the same out of gear when the piston is depressed, and discharge-apertures in the cylinder, normally closed from said passage by the piston, substantially as set forth.

2. In combination, the regulator-cylinder having the side discharge-openings near its lower closed end, the inlet-opening at its opposite end, the depending annular flange around said inlet-opening, forming a seat, the reciprocating piston normally held against said seat, having its piston-rod extending down through the lower end of the cylinder, and the exterior frame arranged to connect said piston with the gear of the mill, said device constituting a windmill-regulator for insertion in the passage from the pump to the tank.

3. In combination, a pump and discharge-

passage therefrom, a regulating-cylinder having one end opening into said passage and its opposite end provided with discharge-apertures, a piston in said cylinder connected with regulating means of the pump and normally held closing said discharge-apertures from the said passage from the top, whereby when the pressure in said passage increases to a certain predetermined point the piston will be forced out to permit the water to discharge at such apertures, substantially as described.

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

HENRY B. NIEBEL.

Witnesses:
O. E. DUFFY,
C. M. WERLE.