

PNEUMATIC PRESSURE RELIEF GOVERNOR.

The design of this air governor is to meet a well known want, namely, that of relieving an air compressor, worked by belt power, or otherwise than with steam direct, from the power used in compressing the air, when it would otherwise compress more air than is wanted for working purposes, thereby saving all the power now expended in compressing such surplus air, which in many cases amounts to 50 or 75 per cent of the power really necessary.

This machine consists in having a branch pipe, O, attached to the upright or discharge pipe, E, in which pipe is a relief valve, B, which is operated by the rod, H, which is attached to the lever, M, to which is connected a piston rod, I, and piston, K, working in an air cylinder, Z. Also to the lower side of the cylinder is a pipe, U, and valve, V, which conveys the air from an air receiver into the air cylinder, Z; this air operates to raise the piston and lever, M, on which is a weight or ball, N, which is placed on the lever so as to balance the maximum pressure of air needed for the work to be done. The check valve, D, is placed in the discharge pipe, E, so that the compressed air shall not return and escape through the relief valve, B, when it is open.

The operation of the governor is as follows: When the compressor is at work, it forces the compressed air through the check valve, D, and discharge pipe, E, into the receiver, until the air is compressed to, say, one hundred pounds pressure per square inch. Now, this pressure applies (through pipe, U, and valve, V) under the piston, K, and this pressure is balanced by the weight, N, and lever, M; but when the pressure rises three or four pounds above the working pressure, it lifts the relief valve against the pressure on the relief valve and against the weight. When the valve is raised even a little, it exhausts the pressure on the top of the valve, and the air pressure in the cylinder, Z, being heavier than the weight and lever, it carries the valve wide open, and remains so until the pressure is reduced in the air receiver about three pounds, when the ball or weight, being the heavier, brings the valve to its seat again; thus it becomes a perfectly automatic pressure governor, and keeps the air steady within three or four pounds, the piston of the pump working at the same rate of speed all the time. In this way, very many compressors may be worked by power, without using any more power than what is necessary to compress the air required.

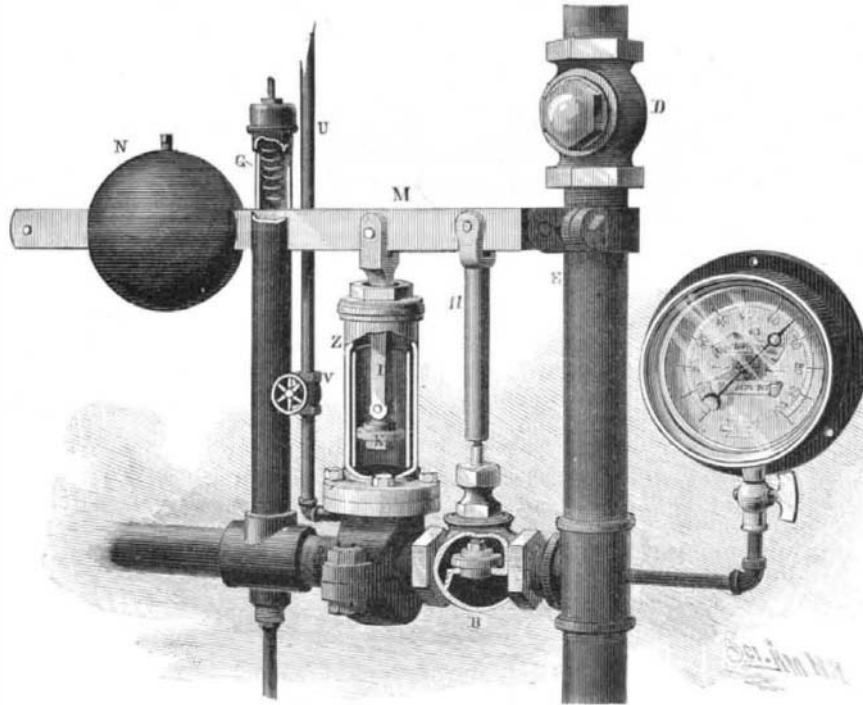
This governor is the invention of Mr. James Clayton, whose works are at 45 and 47 York Street, Brooklyn, N. Y., and whose New York office is at 43 Dey Street.

WATER LEVEL INDICATOR.

This instrument is intended for indicating the level of water at a distance. Fig. 1 is a perspective view of the electro-mechanical transmitter, Fig. 2 shows the receiver with the dial removed, Fig. 3 is a vertical section through the transmitter, and Fig. 4 is a detail view of the dial and indexes. On a shaft journaled in standards secured to the base of the transmitter is a wheel over which passes a chain having at one end a float and at the other end a counterbalance weight. When the water in which the float rests rises, the float is raised and the shaft turned by the chain. This movement, through the intermedium of suitably arranged levers and springs, permits the current from the battery to pass to the line in one direction and to the ground in the other. A further turning of the shaft, caused by continued rising of the water, produces a series of electrical impulses upon the line wire, which are all in one direction, and affect only one of the magnets of the receiver. Each electrical impulse corresponds to the rise of the float through the space of one inch, and each impulse draws down the armature belonging to the magnet, thereby indicating by means of an index, Fig. 4, a rise of one inch. The reverse motion of the shaft caused by the water falling so operates the levers as to reverse the current along the line. This reversed current will not affect the first magnet, but will be effective in operating the second magnet, whose armature will then act upon the recording mechanism to diminish the amount indicated by the indexes. In this manner the level of the water is

always indicated by the indexes in connection with the dial.

The helices of the magnets being of equal resistance, the current from the line is divided at the receiving instrument into two equal parts; this results in the temporary demagnetization of one of the magnets and the augmentation of the power of the other, so that each magnet is rendered effective by the current suited to it. In addition to its use as a water level indicator, this instrument may be used to indicate the height of a gasometer or the distance traveled by any moving object, either in a horizontal or vertical direction.



CLAYTON'S PNEUMATIC PRESSURE RELIEF GOVERNOR.

This invention has been patented by Mr. Wilbur S. Mayers, of Fort Apache, Arizona.

The Young Father's First Telegram.

It is great fun to watch the senders of these first baby dispatches as they prepare them. A young father comes in with a hurried step and an exultant, beaming face. He grasps the blank, and dashes off something like this: "Great news! Mary very ill! Fine boy!"

Then he tears that up. Somehow he doesn't want the rude telegrapher to know the name of the helpless but happy sufferer, and he tries it again. "Expected event realized; a little girl; wife doing well." "But, pshaw!" he says, "that's rather a cold way to speak of her to her own father and mother. Wife—why, of course she's wife, but I don't like that," and he tears it up. Then he starts again, and this time he says, "Confound the telegrapher! He shan't know anything about it;" and he writes, "It has come—eight pounds—female; mother all right." He looks at it a minute and tears it up, with the remark, "They don't know whether that means a Jersey calf or a Hambletonian colt." By this time the young man has got into a sweat, and grabbing a pencil he dashes off, "It's a girl. Mother doing nicely," and after looking at that five or

a girl (or boy). Mother well;" and then the man pays over his half dollar, and nearly pulls me through the window in his fierce desire to go and give the baby a bath.—*Journal of the Telegraph.*

Mounting the Lick Telescope.

The trustees have awarded the contract for mounting the 36-inch objective (now in the hands of the Messrs. Clark, of Cambridgeport) to the firm of Warner & Swasey, Cleveland, Ohio, for the sum of \$42,000. Messrs. Warner & Swasey were successful in a competition which included most of the celebrated makers of the world. One firm of celebrated makers (the Repsold, of Hamburg) declined to compete on account of the short time available for the purpose. The mounting proposed by Messrs. Warner & Swasey will include every one of the improvements which have been lately introduced into the mountings of large telescopes, with the addition of one or two improvements peculiar to themselves.

The telescope is to be 57 feet long; the diameter of the tube is 42 inches. The tube is suspended at the middle, and the point of suspension is to be 37 feet above the floor of the dome. The axes on which the tube moves are supported by a heavy iron column, 17 x 10 feet at its base.

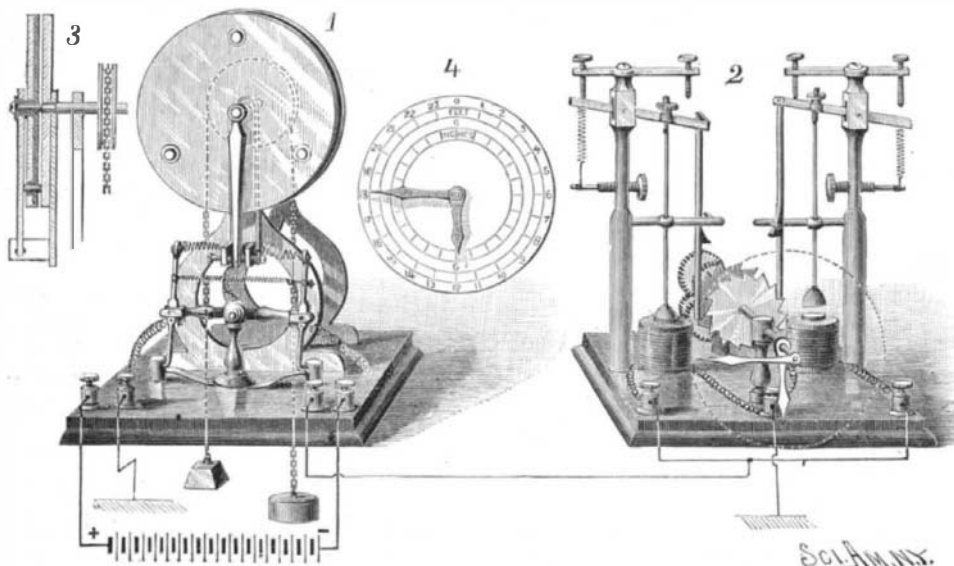
Provisions are made by which it is possible for an observer at the eye end of the telescope to command all the possible motions, and these same motions can also be controlled by an observer stationed on a small balcony 20 feet above the floor. It is expected that, in spite of the great size of the telescope itself and of its great weight, the mechanism will be so delicately adjusted as to render the use of power unnecessary.

Messrs. Warner & Swasey are to have this mounting completed in April, 1887, and some time during the summer of 1887 the glass will be brought to Mt. Hamilton, where the mounting will already have been erected under the great dome, now building at the Union Iron Works, San Francisco, so that one may look forward to the completion of the Lick Observatory some time during the next year. It is impossible without an accurate description to give any complete notion of the excellence of the provisions which have been made by the Lick trustees. A rough idea may be had by considering the cost of the various parts of the great telescope, dome, mounting, etc.: Cost of the dome, \$56,850; cost of the mounting, \$42,000; cost of the visual objective, \$53,000; additional cost of the photographic objective, \$13,000; total, \$164,850. Besides these sums, several thousand dollars will be required to put the instrument into its final completed state.

The Buffalo Carpet Beetle.

T. W. S. says: Please inform me what way I can best get rid of a great pest, the carpet moth. It is about the size of a grain of wheat, is black, and has hair on it like a caterpillar. It will run backward as well as forward. The carpet moth, of which our correspondent complains, is in all probability the so-called "buffalo moth" (*Anthrenus scrophulariæ*), which has previously been figured and described at length in the columns of the SCIENTIFIC AMERICAN. Prof. L. O. Howard, Assistant in Charge of the Division of Entomology, Washington, says: "Where this insect is discovered in a carpeted room, the carpet should be taken up and sprinkled with benzine, and this substance should be poured into the cracks of the floor and under the base-boards. After airing both the room and the carpet, to get rid of the disagreeable odor, strips of roofing paper (prepared with gas tar), about two feet in width, should be spread around the edges of the room, and the carpet should be tacked down over them."

IMPERVIOUS CORKS.—Corks may be made impervious by soaking them—best quality—for several hours in a solution of one-half ounce of glue or gelatine in a mixture of three-fourths ounce of glycerine and one pint of water, heated to a temperature of about 50° C. Such prepared corks may be rendered nearly proof against acids and other chemicals if they are dipped, after thorough drying, for ten or fifteen minutes into a melted mixture of four parts of paraffine and one part of vaseline.



WATER LEVEL INDICATOR.

six minutes, and it may be with a moistened eye, he signs his first name to it and hands it in. They're proud and happy and conscious, and yet they will do almost anything to conceal their identity.

Sometimes the young man comes in showing signs that the great domestic event has been too much for him, and then I have to take the pencil and help him out, and I do it in a practical way. I get the address and I simply write, "The little stranger is here. It is