J. KAYSER.

Improvement in Steam-Pressure Gauges.

No. 128,401. Patented June 25, 1872.

Fig. 1.

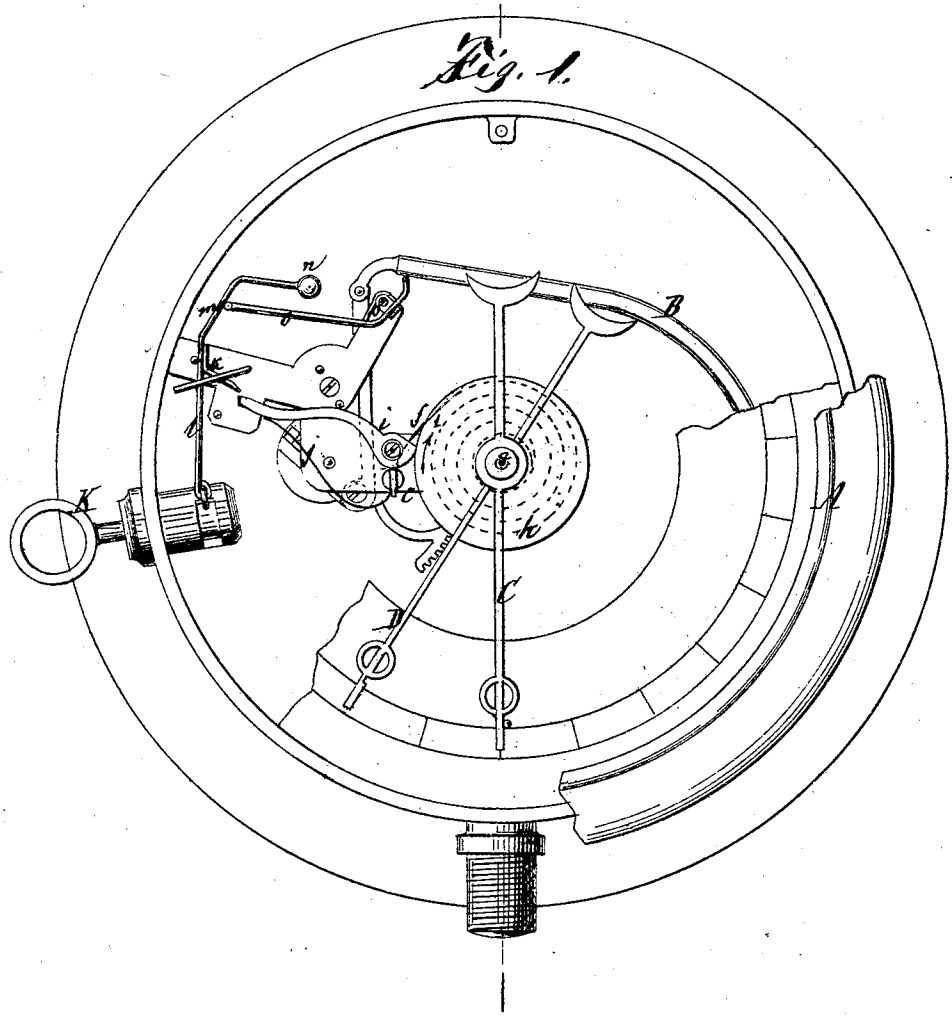
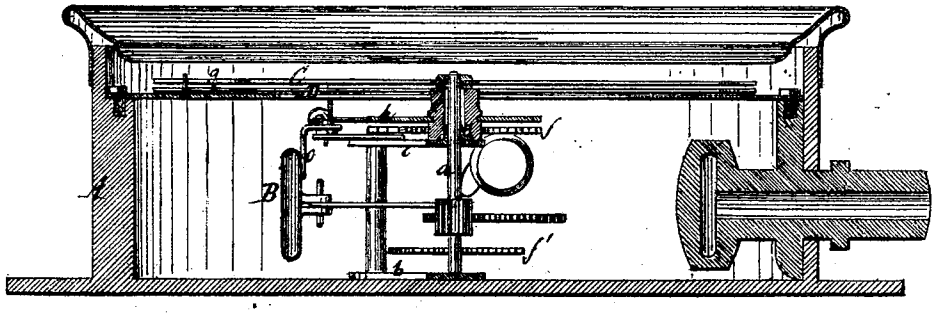


Fig. 2.



Witnesses.

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JOSEPH KAYSER, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-PRESSURE GAUGES.

Specification forming part of Letters Patent No. 128,401, dated June 25, 1872.

To all whom it may concern:

Be it known that I, JOSEPH KAYSER, of the city, county, and State of New York, have invented a new and useful Improvement in Steam-Gauges; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a face view of my gauge, a portion of its dial-plate being broken away so as to expose the working parts. Fig. 2 is a transverse section of the same in the plane *x x*, Fig. 1.

Similar letters indicate corresponding parts.

This invention relates to a registering-gauge the maximum hand of which is arrested immediately the main hand of the gauge falls back by means of a lever-cam, which bears on the circumference of a plane disk mounted on the hollow arbor or hub of the maximum hand in such a manner that said maximum hand has no dead motion, and thus indicates at all times the exact maximum pressure to which the steam has been allowed to rise during a certain interval. With the cam-lever that serves to arrest the maximum hand is combined a releasing-tappet, which is operated by a key, to be inserted through a hole in the case, and which bears against a stop actuated by the mainspring of the gauge in such a manner that when the maximum hand has been carried to a certain point on the dial-plate it cannot be caused to fall back while the main hand stands on zero, and that, in case the boiler explodes without destroying the steam-gauge, the maximum hand will show the amount of pressure which exists in the boiler at the moment of the explosion.

In the drawing, the letter A designates a steam-gauge, the operation of which is based on the action of the steam on a curved tubular spring, B, or upon a spring of any desired shape or construction, connecting, by suitable gear, with the arbor *a*, carrying the main index-hand C. This arbor has its bearings in plates *b c* secured in the interior of the case, and from the upper or outer plate *c* rises a tubular projection, *d*, forming the guide for the hollow arbor *e*, carrying the maximum hand D. A coiled spring, *f*, which acts on the hollow arbor *e*, has a tendency to carry the maximum hand back to zero, while another coiled spring, *f'*, acts in a like manner on the arbor *a* of the main index C. In this main index is secured a pin, *g*, and as the main index advances this pin bears against the edge of the maximum hand and carries the same forward; but when the main index recedes the maximum hand is intended to stop so as to indicate the highest point reached by the main index. On the hollow arbor of the maximum hand is firmly mounted a disk, *h*, which is subjected to the action of a lever-cam, *i*, the point of which is pressed up against the circumference of the disk by a spring, *j*, said point being so situated in regard to the fulcrum of the lever-cam that the disk can revolve freely in a forward direction, indicated by arrow 1 in Fig. 1; but if an attempt is made to turn the disk back the point of the cam immediately catches against the edge of said disk and retains it firmly in position. By these means the maximum hand is arrested immediately the main index begins to recede. No dead motion of said maximum hand takes place, and the exact maximum pressure indicated by the gauge is recorded. For the purpose of releasing the maximum hand and allowing it to recede to the starting-point, or until it comes in contact with the pin of the main index, a key, K, is used, which is inserted through the side of the case, and acts on a tappet, *k*, secured to a rod, *l*, the upper end of which forms an incline, *m*, and is loaded by a weight, *n*, by means of which said rod is held in contact with one end of a lever, *o*, that swings on a fulcrum-pin, *p*, and the other end of which bears against or is connected with the spring B of the gauge, the two arms of said lever being so balanced that the weight of the arm bearing against the tappet-rod *l* keeps the opposite end of the lever in contact with the spring B. As soon as this spring recedes by the pressure of the steam the long arm of the lever *o* slides down on the incline *m* of the tappet-rod and the weight *n* carries the tappet *k* inward. The lever *o* is so adjusted that when the spring B of the gauge is not exposed to pressure the tappet *k* will be kept back beyond the end of the lever-cam *i;* and if the maximum hand has been arrested at, say, one hundred and twenty pounds' pressure and the main in-

dex has receded to the starting-point, the maximum hand cannot be brought back to its starting-point by the action of the key or other means short of opening the case of the gauge. For as long as the spring B is not exposed to pressure, the tappet *k*, on being carried down by the action of the key K, clears the tail of the lever-cam *i*, and the maximum hand is not released; but as soon as steam is raised in the boiler and permitted to act on the spring B the loose end of said spring recedes, the lever *o* allows the tappet *k* to fall in over the tail-end of the lever-cam, and if the key K is inserted and turned in the proper direction the maximum hand is released and permitted to fly back in contact with the carrying-pin of the main index.

It will be readily seen that the lever *o* and the incline of the tappet-rod *l* can be so adjusted that it requires a pressure of ten, twenty, or more pounds in order to bring the tappet in position to strike the tail-end of the lever-cam *i* on being depressed.

The object of this arrangement is to keep a record of the pressure existing in a boiler at the moment it explodes, and to prevent the proprietor of the boiler or the fireman from disturbing this record. For if a boiler explodes at a pressure of, say, one hundred and twenty pounds, the maximum hand of the gauge (provided the gauge is not destroyed) will retain its position, while the main index recedes to the starting-point, and, since the maximum hand in my gauge cannot be released unless the spring B is exposed to a certain pressure, (without breaking the gauge open,) a true record will be kept of the pressure existing in the boiler at the moment of the explosion.

It is obvious that this invention is applicable to steam-gauges of any desired construction, the action of which depends upon the pressure of steam on a spring without regard to the form of such spring.

I do not claim, broadly, a detent-pawl operating upon the periphery of a disk or wheel; but

What I claim as new, and desire to secure by Letters Patent, is—

1. The lever-cam *i* and plane disk *h*, in combination with the arbor *a*, hollow arbor *e*, and hands C D, all arranged and operating substantially as and for the purpose set forth.

2. The combination of the tappet-rod *l*, lever *o*, lever-cam *i*, and disk *h* with each other and with the spring and maximum hand of a steam-gauge, substantially as and for the purpose set forth.

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Witnesses:
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