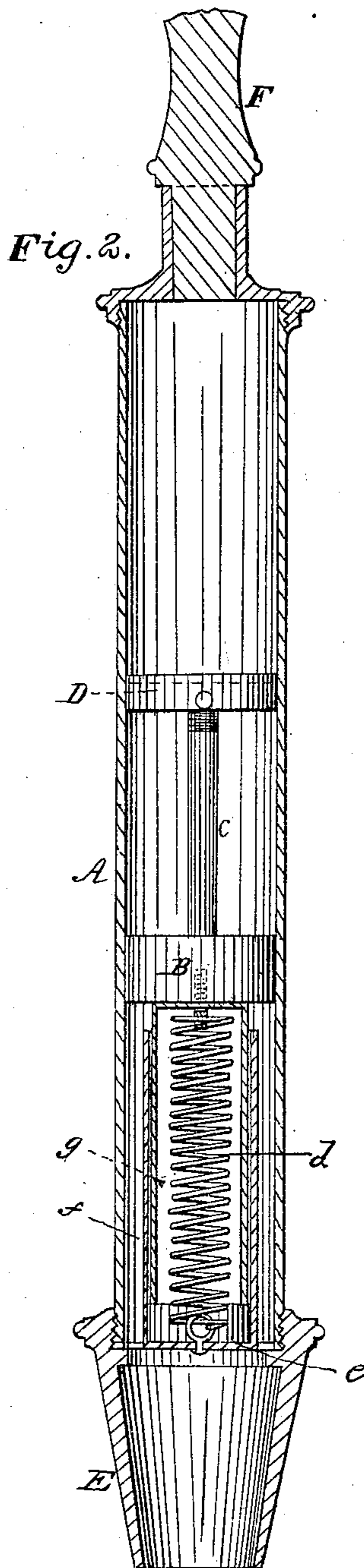
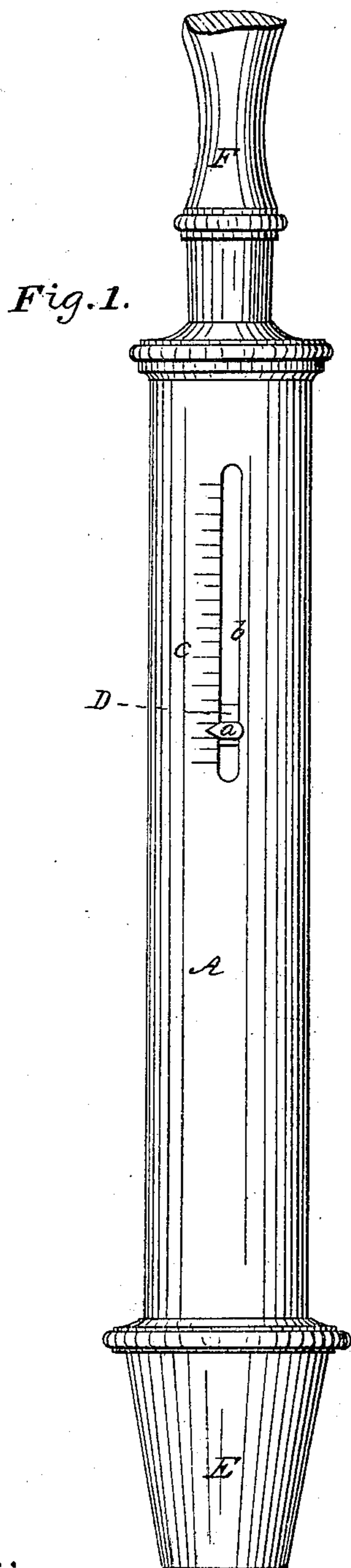


J. STORER.  
Pressure Gage.

No. 93,366.

Patented Aug. 3, 1869.



Witnesses:  
*C. Wahlers*  
*E. F. Kastenhuber*

Inventor:  
*J. Storer*  
*per Van Kesteren & Hauff*  
*attys*

# United States Patent Office.

JOHN STORER, OF NEW YORK, N. Y.

Letters Patent No. 93,366, dated August 3, 1869.

## IMPROVEMENT IN HOT-BLAST PRESSURE-GAUGES.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, JOHN STORER, of the city, county, and State of New York, have invented a new and improved Hot-Blast Pressure-Gauge; 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 longitudinal central section of this invention.

Figure 2 is a side elevation of the same.

Similar letters indicate corresponding parts.

This invention consists in the arrangement of a protecting-tube, in combination with the spring, which is attached to the piston of the gauge, said protecting-tube being situated in the interior of the channel, through which the hot-blast passes to the piston, in such a manner that the spring is protected against the influence of the hot-blast, and said hot-blast is enabled to act on the piston without disturbing the correct action of the gauge.

A tapering nozzle, secured to the casing of my gauge, serves to apply the same conveniently to the tuyere-pipe of a blast-furnace.

In the drawing—

The letter A designates a tubular case, which is bored out to receive the piston B.

This piston connects, by a rod, C, with a secondary piston, D, that serves to steady the main piston B, and also forms the bearing for the index *a*, which projects through a slot, *b*, in the case A, and traverses over a scale, *c*, marked on said case, as shown particularly in fig. 2 of the drawing.

The piston B is subjected to the action of a spring, *d*, which is fastened, at one end, to a cross, *e*, and at its other end to the piston, so that by the action of said spring the piston is pulled down, causing the index *a* to point to the zero-line of the scale *c*.

The cross *e* is secured in the bottom end of the case A, and it supports a tube, *f*, which surrounds the

spring *d*, and protects the same against the action of the hot-blast.

In practice, I propose to attach an additional protecting-pipe, *g*, to the bottom end of the piston B, said pipe being intended to surround the spring, and to fit into the tube *f*, as indicated in red outlines in fig. 2.

By the application of this second protecting-pipe, the hot-blast will be prevented from coming in contact with any portion of the spring, even if said spring is stretched out.

To the bottom end of the case A is secured a tapering nozzle, E, capable of being inserted into the tuyere-pipe of a blast-furnace, and in the outer end of said case is fastened a handle, F, of wood or other bad conductor of heat, so that the gauge can be conveniently handled without burning the fingers.

If it is desired to ascertain the pressure of the air or blast in a blast-furnace, the gauge is inserted, by means of its tapering nozzle, into one of the tuyere-pipes, thus exposing the piston B to the action of the hot-blast.

The piston is thereby forced out against the action of its spring *d*, and the index shows the amount of pressure of the hot-blast.

During this operation the spring is protected against the injurious influence of the hot-blast by the tube *f*, and the correct action of the instrument is insured.

Having thus described my invention,

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

1. The protecting-tubes *f g*, fitting and sliding within each other, in combination with the case A, piston B, cross *e*, and spring *d*, substantially as and for the purpose described.

2. In combination therewith, the secondary piston D, elevated above piston B, guiding the latter, and carrying the index *a*, as set forth, for the purpose described.

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.

JOHN STORER.