

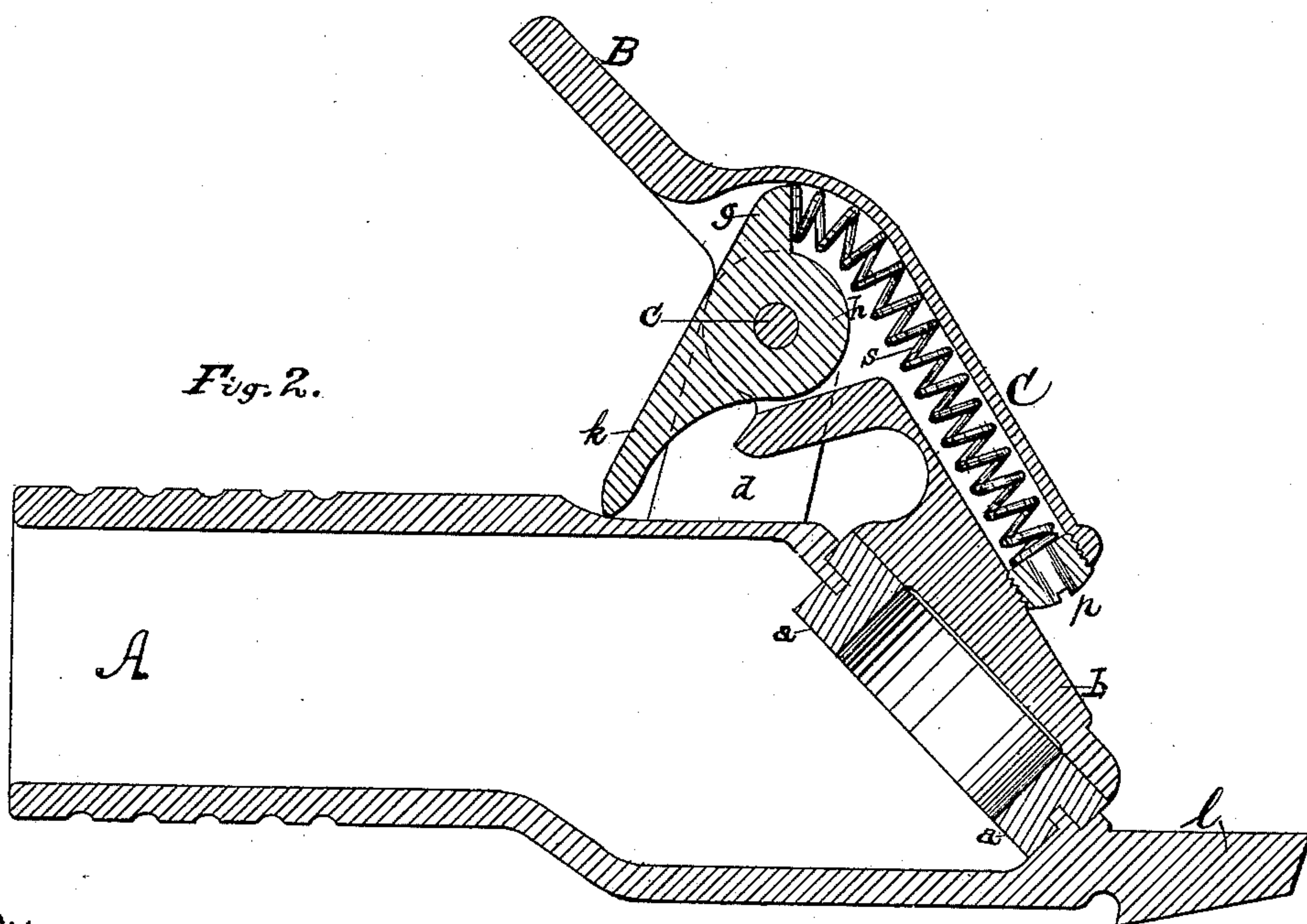
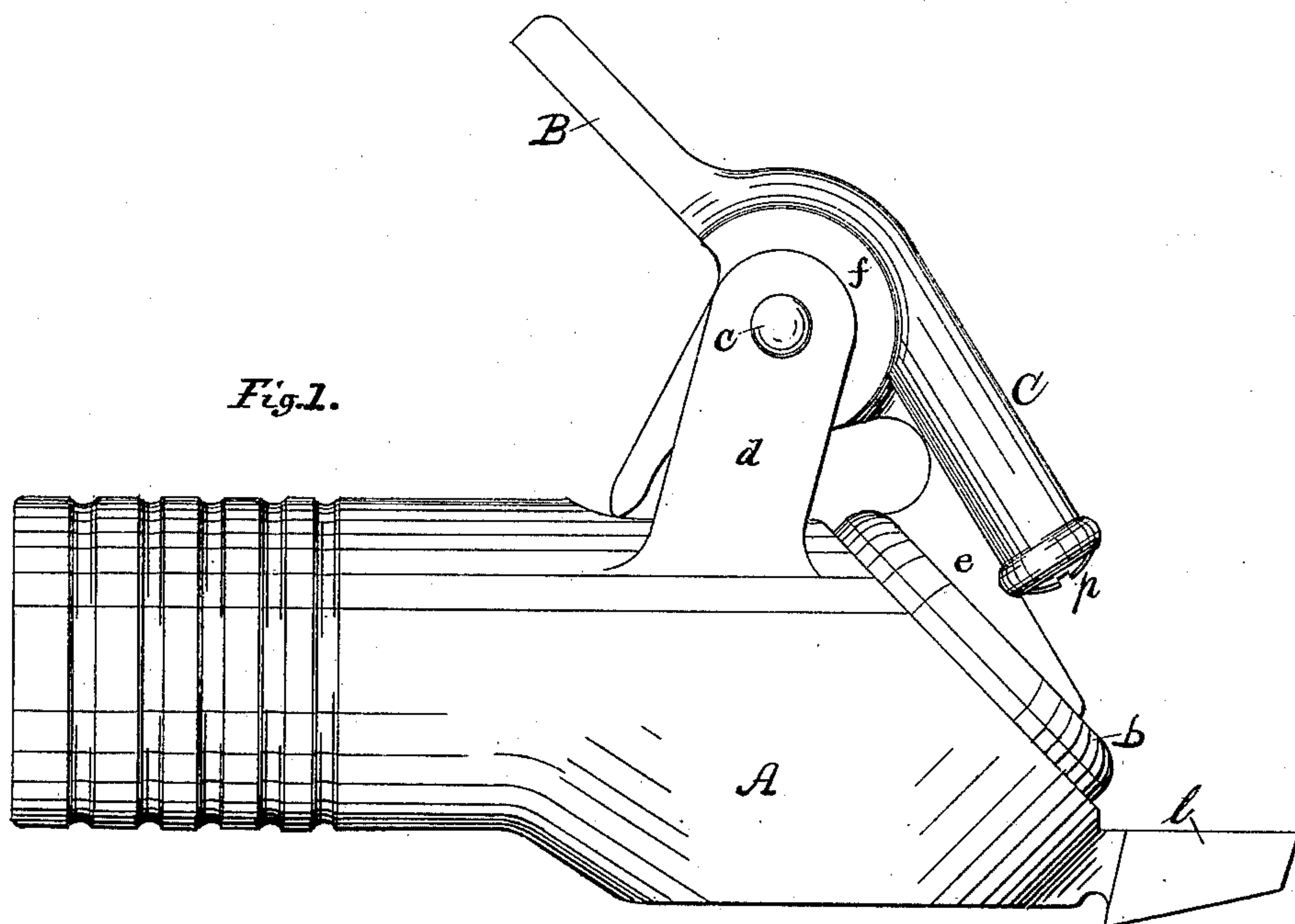
(No Model.)

E. S. BOYNTON.

VALVE FOR PNEUMATIC PIPES OR TUBES.

No. 401,680.

Patented Apr. 16, 1889.



Witnesses,

Frank L. Entwistle  
Francis P. Reilly

Inventor

Edward S. Boynton

By his Attorney C. B. Voorhies



# UNITED STATES PATENT OFFICE.

EDWARD S. BOYNTON, OF NEW YORK, N. Y., ASSIGNOR TO THE CAMPBELL PRINTING PRESS AND MANUFACTURING COMPANY, OF SAME PLACE.

## VALVE FOR PNEUMATIC PIPES OR TUBES.

SPECIFICATION forming part of Letters Patent No. 401,680, dated April 16, 1889.

Application filed December 1, 1887. Serial No. 256,610. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD S. BOYNTON, of the city of New York, in the county and State of New York, have invented a new and useful Improvement in Valves for Pneumatic Pipes or Tubes, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to render external valves for pneumatic pipes more certain and durable in their operation as self-closing valves.

The invention will first be described in detail, and then particularly set forth in the claims.

In the accompanying drawings, Figure 1 illustrates in exterior side elevation a valve as attached to the pipe of a "vacuum-brake" for railroad-cars. Fig. 2 shows a longitudinal vertical section through Fig. 1.

Said figures illustrate the well-known Eames vacuum-brake valves with my improvement applied thereto.

In said figures the several parts are indicated by letters as follows: To the pipe proper or coupling, A, adapted to be secured to a rubber hose at one end, is fitted at the other end a rubber or other valve-seat, *a*, and faced to fit said seat is the valve *b*, pivoted at *c* between two similar lugs, *d*. Said valve is connected by a web, *e*, to a boss, *f*, through the eye of which the valve is pivoted at *c*, as before said. Said boss is cored out, as shown in Fig. 2, and extended above into a handle or lever, B, and in an opposite direction over the web *e* into a hollow tube, C. The open end of said tube is closed with a screw-plug, *p*, and the bore of the tube is filled with a coiled spring, *s*, one of whose ends bears upon said plug and the other against a stop, *g*, formed on the boss *h* of an arm, *k*. An eye in the boss *h* coincides with the eyes in the lugs *d* and boss *f*, and a single pin, *c*, is passed through all of said eyes, forming a pivot for the valve *b*, as shown. The catch or clip *l* on the end of the pipe A shows a part of the well-known coupling-clutch for vacuum-brake pipes, which mates with a counterpart when the two pipes are coupled. It is obvious, now, that when the handles B of the opposite valves

are depressed the valves *b* will rise from their seats, turning upon centers at *c*. Thus angular motion of each valve will compress its inclosed spring *s* against the stop *g*, said spring thus always opposing the opening of the valve. As soon as the handles B are released, each valve will fly closed upon its seat by the reaction of its spring *s*. This the valve shown in the drawings, however, cannot do as long as its pipe is coupled to another pipe; but immediately upon the uncoupling the valve will fly shut. In order to couple, each handle B must first be depressed. It is also quite obvious now that if a valve similar to *b*, with a spring attachment such as shown, were attached to a wind-instrument—as a key, for instance, to some musical wind-instrument—the depression of the handle B would open the key, and upon release of the handle B the key would automatically close. Not only can this valve and its mechanism be made very neat and small where required, but its spring is unseen, is protected from dirt within its case, and equally protected from the weather.

Valves of this character are necessarily closed through the action of a spring. In the well-known vacuum-brake valves above referred to the spring enwraps the pivot upon which the valve oscillates, one end of the spring acting upon the valve and the other reacting upon the case, the operation being to effect torsional action in the spring. It is well known in employing springs of this variety that they are very perishable, because of, first, the liability of the bent ends to break off through the transverse strain brought upon the metal, and, second, because of the necessarily small limit given to the length of wire in the spring and consequent short life of such spring through great flexure or twisting in operation at any given point in the wire. With valves of this description it would be particularly fatal to have them closed by a perishable spring or one liable to rapid deterioration. It is therefore very desirable to insure permanency or long life to the springs for said valves. The spring used in the brake-valves above mentioned, aside from its liability to fracture at its reacting ends or through excessive torsion for the length of wire employed, is subject to the deteriorating influences of grit, dirt, moisture, snow, and ice, some of which are always



more or less present under and about a rail-  
road-car. It is the object, then, of this inven-  
tion to replace said perishable form of spring  
by a compressive helical spring confined with-  
5 in a tube or tubular guide, effecting thereby  
at one and the same time the use of a spring  
whose material is deflected or twisted under  
action very much less because of the greater  
length of wire admissible. This construction,  
10 therefore, gives a spring much more durable  
or longer lived, and which will entirely avoid  
the contingency of the breaking off of react-  
ing ends, and at the same time be inclosed  
and protected from the deteriorating influence  
15 of grit, dirt, moisture, snow, and ice.

I am aware that helical compressive springs  
have been used for the automatic closing of  
valves, and that such a combination is not  
broadly new; but in such cases both the springs  
20 and valves are not external to but one or both  
within a valve-casing, so that, unlike in my  
invention, the spring is exposed to the action  
of either the fluids which may pass through

the pipes to which the valves are attached or  
to external deteriorating influences, as before 25  
described.

I do not claim the coupling-pipe nor the  
valve proper; but,

Having thus fully described my improve-  
ment, as of my invention I claim— 30

1. In combination with an external pivoted  
valve, a compressive helical spring inclosed  
within a tubular guide formed upon or at-  
tached to the valve, substantially as and for  
the purposes set forth. 35

2. In combination with an external pivoted  
valve, a self-closing device consisting of a  
compressive helical spring held within a tubu-  
lar guide formed upon or attached to said  
valve between one end of said guide and a 40  
stop at the pivotal point of the valve, sub-  
stantially as and for the purposes set forth.

EDWARD S. BOYNTON.

Witnesses:

JOHN T. MURPHY,  
WM. T. VAN ALLEN.