

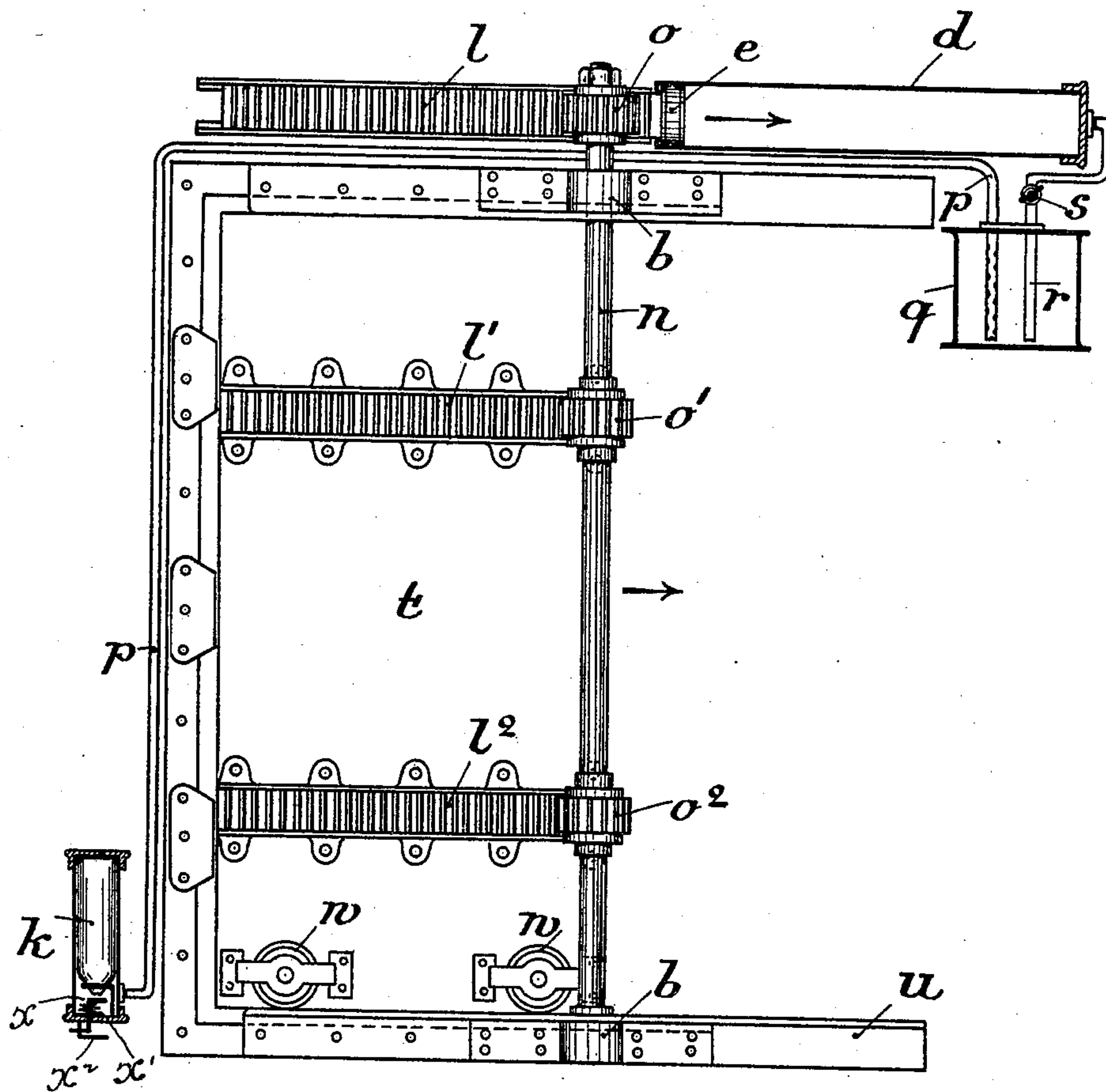
(No Model.)

A. VON DER ROPP.

APPARATUS FOR AUTOMATICALLY CLOSING OR OPENING DOORS.

No. 583,155.

Patented May 25, 1897.



WITNESSES:

*O. Munk*  
*H. M. Ropp*

INVENTOR:

BY ATTORNEY:

*Alexander von der Ropp*  
*Heinrich Ropp*

# UNITED STATES PATENT OFFICE.

ALEXANDER VON DER ROPP, OF BERLIN, GERMANY.

## APPARATUS FOR AUTOMATICALLY CLOSING OR OPENING DOORS.

SPECIFICATION forming part of Letters Patent No. 583,155, dated May 25, 1897.

Application filed December 30, 1896. Serial No. 617,480. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER VON DER ROPP, a subject of the Emperor of Russia, residing at Berlin, Germany, have invented an Improvement in Apparatus for Automatically Closing or Opening Doors, of which the following is a specification.

This invention refers to improvements in apparatus for automatically closing doors in ships, bulkheads, walls and ceilings in stores, factories, and the like.

The invention consists in an improvement in the apparatus described and claimed in Letters Patent No. 578,028, granted to me March 2, 1897.

The accompanying drawing is a diagrammatical section of the apparatus according to this invention as applied to sliding doors in ships' bulkheads.

In the drawing,  $n$  is a spindle pivoted in fixed bearings  $b\ b$ .  $o\ o'\ o^2$  are cog-wheels of suitable size, fastened in the usual way on the said spindle.

$l, l',$  and  $l^2$  are three racks which engage with the cog-wheels  $o, o',$  and  $o^2$ , and two of which,  $l'$  and  $l^2$ , are fastened to the sliding door  $t$ . The sliding door  $t$  moves on a suitable rail  $u$  by means of wheels or rollers  $w\ w$ .

The rack  $l$  is firmly connected with a piston  $e$ , moving in a cylinder  $d$ . At the opposite end of the cylinder  $d$  the tube  $r$  opens into it, the other end of which passes into a closed vessel  $q$  and reaches down to near the bottom of said vessel.

$s$  is a valve by means of which the passage of liquid through the tube  $r$  can be throttled, if desirable.

A second tube  $p$  likewise passes into the vessel  $q$ , with this difference: that it is either cut off short below the lid of the vessel  $q$  or also provided with a suitable number of holes reaching up to the proximity of said upper lid.

The tube  $p$  connects the vessel  $q$  with a case  $K$ , containing a glass vessel filled with compressed gas and being provided with means for automatically breaking said glass vessel and thereby setting the compressed gas free to act upon the vessel  $q$  and thereby on the cylinder  $d$ .

The means for breaking the compressed-gas vessel may be of any desired form, and I have shown as an instance of said means a

knocker  $X$ , consisting of a bent piece of material guided in the case  $K$  of the vessel and under tension of a spring  $X'$ . The lower end of this knocker has a foot which may be soldered or fixed to the small bracket  $x^2$  by any suitable soluble material, so that under the action of heat the connection will be loosened and the knocker set free to strike and break the vessel under the action of the spring. I do not wish to limit myself to a connection which will loosen under heat, as one may be used which will loosen when wet.

This latter part of my invention is fully described and claimed in my applications for Letters Patent, &c.

The operation of my present invention is as follows: The vessel  $q$  is filled with a suitable permanent liquid, such as oil, glycerin, or the like. When the door is pushed open, the racks  $l'$  and  $l^2$  will cause the cog-wheels  $o'$  and  $o^2$  to revolve. Consequently the cog-wheel  $o$ , being mounted on the same spindle  $n$ , will likewise revolve and will cause the rack  $l$  to move in the same direction in which the door is being pushed and will thereby drive the piston  $e$  backward. When, on the other hand, from the action of heat or water the glass vessel contained in the case  $K$  is automatically broken, the freed gas will act through tube  $p$  upon the surface of the liquid contained in vessel  $q$  and cause this liquid to rise up in the tube  $r$  and to enter the cylinder, pushing the piston before it and closing the door by means of the spindle  $e$  and the racks and cog-wheels  $l'$  and  $l^2, o'$  and  $o^2$ . Thus though the piston is not perfectly air-tight it will nevertheless act satisfactorily, because a joint that would let air escape will effectually prevent the escape of a thick liquid, such as oil or glycerin.

I wish it to be understood that my invention has only been described by way of illustration as applied to sliding doors; but it stands to reason that it can be applied to all kinds of doors or trap-doors by arranging suitable known means for connecting the piston with the door.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In combination with the movable door,



a cylinder, a piston working therein, a piston-rod with connections to the door, a vessel containing an expansible fluid and adapted to release the same under certain predetermined  
5 conditions, a chamber *q* between the expansible-fluid vessel and the cylinder, said chamber containing a liquid, and the connections from the expansible-fluid vessel to the fluid-chamber and from the fluid-chamber to the  
10 cylinder, substantially as described.

2. In combination with the movable door, a cylinder, a piston therein having its piston-rod connected to the door, a vessel containing an expansible fluid, a casing containing

said vessel, a chamber *q* between the expansible-fluid vessel and the cylinder, said chamber containing a liquid, the connections from the casing of the expansible-fluid vessel to the fluid-chamber, the connection from the fluid-chamber to the cylinder and means for  
15 breaking the expansible-fluid vessel, substantially as described. 20

In witness whereof I have hereunto set my hand in presence of two witnesses.

ALEXANDER VON DER ROPP.

Witnesses:

HENRY HASPER,  
W. HAUPT.