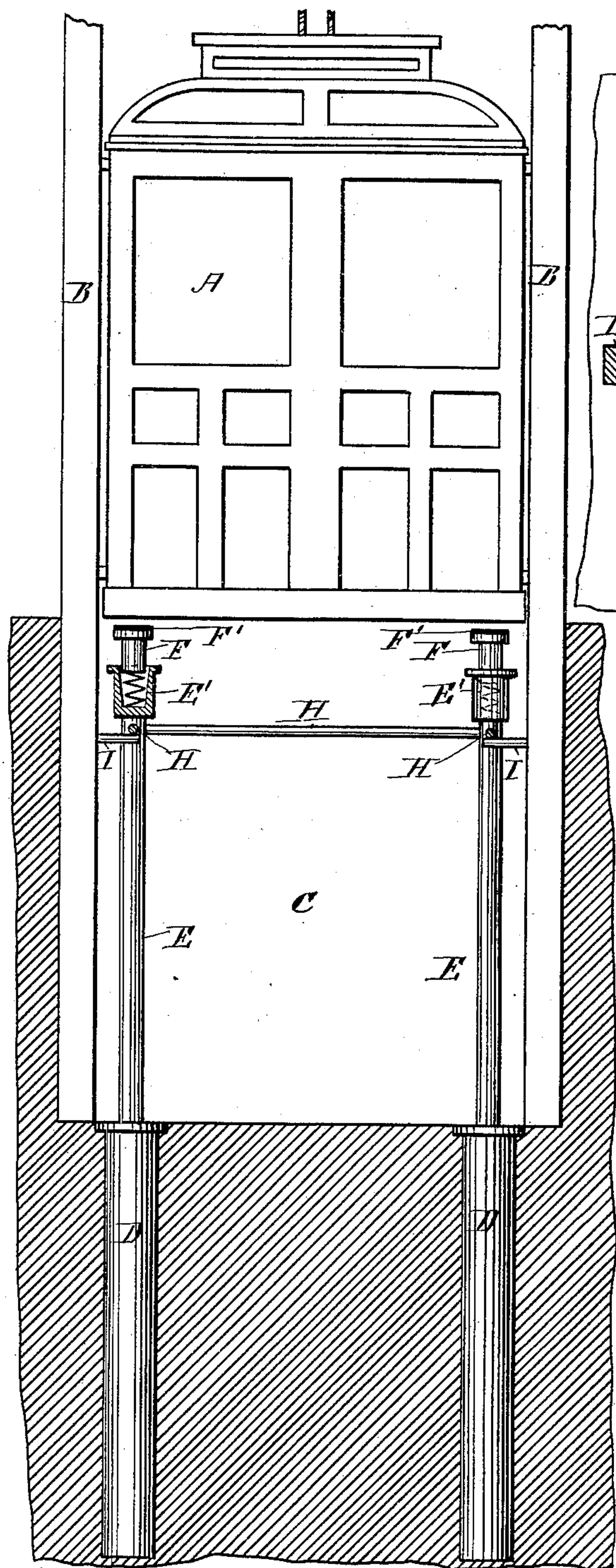


(No Model.)

W. E. NICKERSON.  
SAFETY CUSHION FOR ELEVATORS.

No. 409,487.

Patented Aug. 20, 1889.



WITNESSES.

Matthew M. Blunt.  
Frankly. Parker.

Fig. 1.

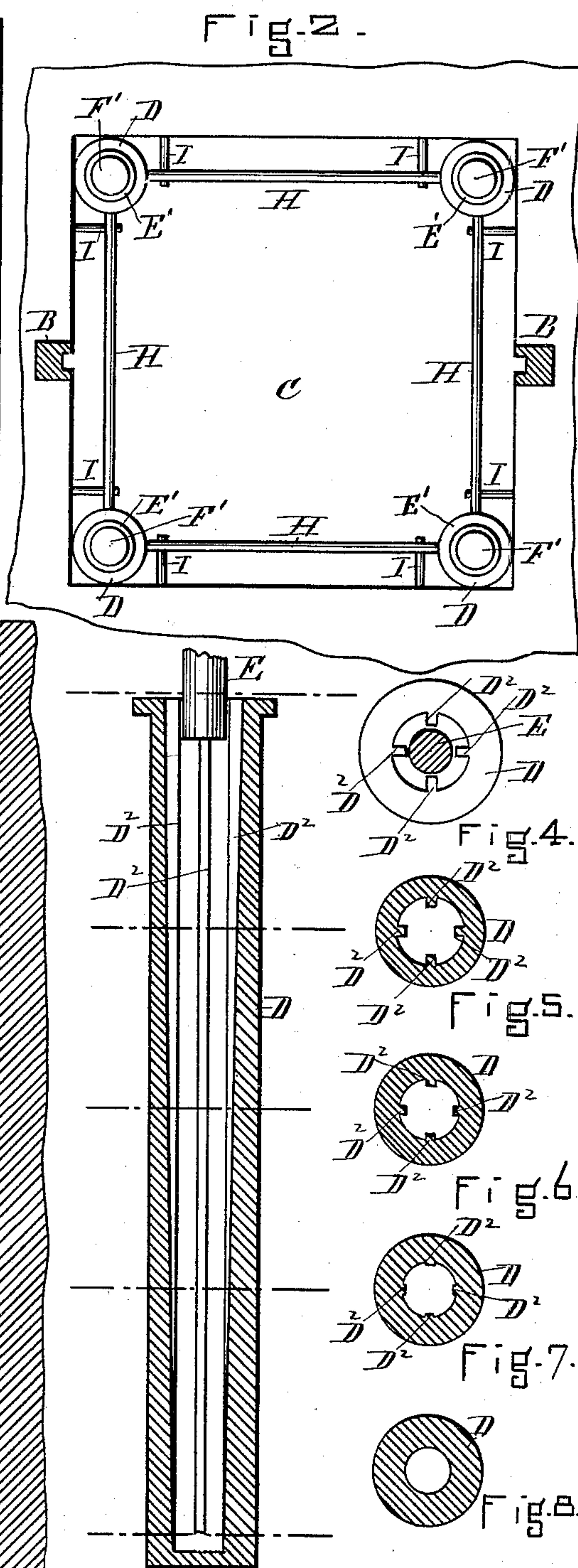


FIG. 3. INVENTOR

William E. Nickerson



# UNITED STATES PATENT OFFICE.

WILLIAM E. NICKERSON, OF CAMBRIDGE, MASSACHUSETTS.

## SAFETY-CUSHION FOR ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 409,487, dated August 20, 1889.

Application filed May 15, 1889. Serial No. 310,882. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM EMERY NICKERSON, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Non-Rebounding Hydraulic Safety-Cushions for Elevators, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to elevators, its object being to bring the carriage gradually to rest without rebound in case it should fall from the breaking of its hoisting-ropes or from any other cause.

It consists chiefly in locating at the bottom of the elevator-well one or more hydraulic cylinders having a taper bore and loosely-fitting plungers, whereby the falling carriage may be brought gradually to rest by the increasing hydraulic resistance to the descent of the plungers as they approach the lower and smaller end of the bore.

My invention is illustrated by the accompanying drawings, in which—

Figure 1 shows, partly in elevation and partly in vertical section, such parts of an elevator with my device attached as are necessary to illustrate my invention. Fig. 2 is a plan of my device. Fig. 3 shows in vertical section one of the cylinders having a taper bore. Fig. 4 is a plan of the top of one of the hydraulic cylinders, showing the plunger in section. Figs. 5, 6, 7, and 8 are horizontal sections of one of the cylinders, taken as indicated by the dotted lines.

A, Fig. 1, is an elevator-carriage, B B the guide-posts, and C a pit located at the bottom of the well-room.

D D are cylinders firmly embedded in the earth at the bottom of the pit C. These cylinders have taper bores, said bores being smallest at the lower end and are provided with plungers E E, whose upper ends are expanded at E' E' into short cylinders having also taper bores similar to D D. The cylinders E' E' have short plungers F F, whose tops are provided with rubber pads F' F'. The upper ends of the plungers E E are tied together by the rods H H, and they are supported in their upper or normal position by the pins or pegs I I. These pins I I may be

of metal or wood and are strong enough to easily support the plungers, but are adapted to give way in the event of the carriage descending with increased speed upon the plungers.

The cylinders D D have on their inner sides the tapering ribs D<sup>2</sup> D<sup>2</sup>, which serve the purpose of keeping the plungers E E centrally within the bore. These ribs are shown in elevation in Fig. 3 and in vertical section in Figs. 4, 5, 6, and 7. The cylinders D D and E' E' are filled with some liquid, water with a thin layer of oil on top of it to prevent evaporation being well suited for the purpose.

The operation of my device is as follows: The falling carriage comes first in contact with the rubber pads F' F' upon the upper ends of the small plungers F F. The graduated resistance of the plungers F F to entering the cylinders E' E' is sufficient to break or bend the supporting-pins I I and to prevent the shock which without them the carriage would receive in coming in contact with the comparatively heavy plungers E E. The carriage now carries the plungers E E before it, but they in descending into the cylinders D D meet with continually-increasing resistance owing to the contraction of the bores, and so the speed of the carriage is gradually checked without rebound. The liquid will be mostly thrown out of the cylinders by the entrance of the plungers; but as this only occurs in case of accidental fall of the carriage it is not an objectionable result. However, by enlarging the tops of the cylinders D D and using a suitable cover the ejection of the liquid may be prevented. In the drawings the cylinders D D are shown as located at the bottom of a pit similar to a so-called "air-cushion." This pit is not essential to my device, but may be used as an air-cushion co-operating with it, provided care is taken not to have the carriage fit too closely, as in that case there is danger of rebounding.

It is evident that, instead of using a taper bore and a cylindrical plunger, a cylindrical bore and a tapering plunger may be used with the same effect.

I claim—

1. In an elevator-cushion, the plunger E, detached from the carriage and supported nor-

mally in its withdrawn position, and the cylinder D, having a taper bore, substantially as and for the purpose set forth.

2. In an elevator-cushion, the cylinder D,  
5 having a taper bore, the plunger E, having upon its upper end the cylinder E', and the plunger F, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two 10 subscribing witnesses, on this 13th day of May, A. D. 1889.

WILLIAM E. NICKERSON.

Witnesses:

FRANK G. PARKER,  
MATTHEW M. BLUNT.