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Steinhauer

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(54) **ELEVATOR SYSTEM**

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(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,658,155 A * 4/1972 Salter B66B 39/00 187/270
3,896,736 A * 7/1975 Hamy B66B 9/003 104/127

(Continued)

FOREIGN PATENT DOCUMENTS

CN 101172466 A 5/2008
EP 3 122 680 B1 8/2018

(Continued)

OTHER PUBLICATIONS

English abstract for JPH0648672.

(Continued)

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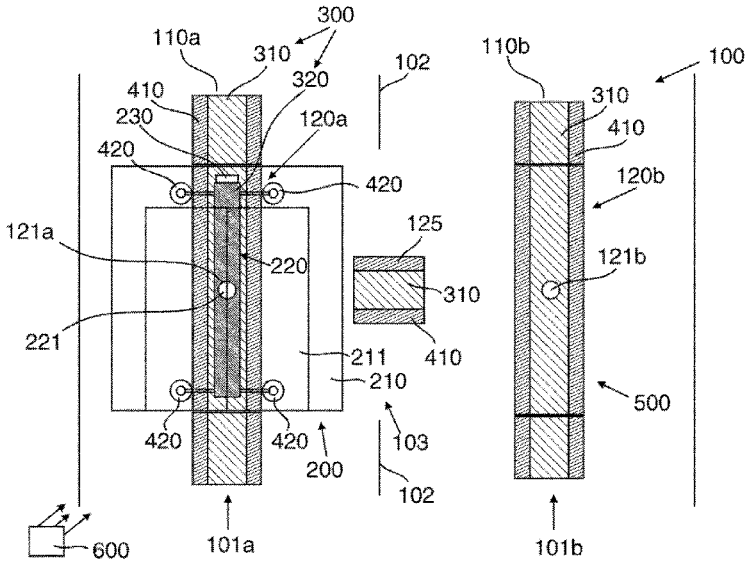
(57) **ABSTRACT**

An elevator system may include at least two elevator shafts and at least one elevator car. A vertically extending rail may be disposed in each elevator shaft, and the elevator car may travel along the vertically extending rail. Each rail may be formed with a rotatable segment such that the rotatable segments can be aligned relative to one another in a transfer plane. Thereafter, the elevator car may travel between the elevator shafts along the segments. In some cases, the vertically extending rail may form part of a linear drive that causes the elevator car to move without the use of cables.

13 Claims, 4 Drawing Sheets