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Patented Dec. 2, 1902.

H. B. AZADIAN.
RACK AND PINION MECHANISM.

(Application filed Dec. 9, 1901.)

(No Model.)

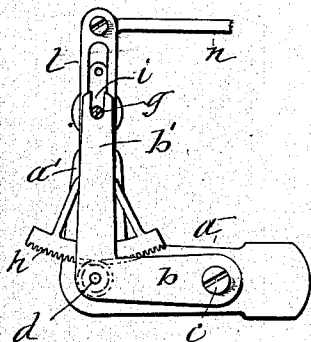


Fig. 1

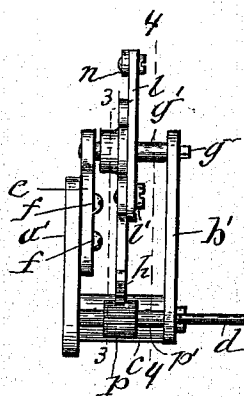


Fig. 2

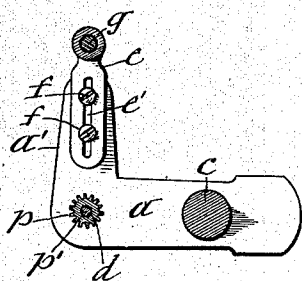


Fig. 3

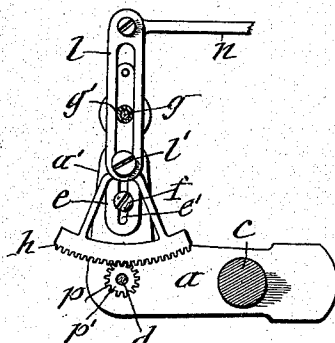


Fig. 4

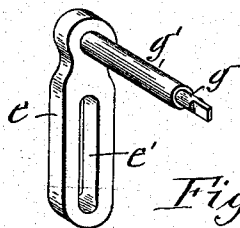


Fig. 5

WITNESSES:

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RACK-AND-PINION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 714,771, dated December 2, 1902.

Application filed December 9, 1901. Serial No. 85,145. (No model.)

To all whom it may concern:

Be it known that I, HARUTÜN B. AZADIAN, a subject of the Sultan of Turkey, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Rack-and-Pinion Mechanism, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 This invention relates to the class of rack-and-pinion mechanisms in which the rack is of segmental form and receives oscillatory motion, which it transmits to the pinion; and the invention is more particularly designed
15 to be applied to the rack-and-pinion mechanisms employed for transmitting motion to the indicator traversing the dial of a steam or water gage. Such rack-and-pinion mechanisms require great accuracy in their working
20 to render the indicator sensitive and quickly responsive to the pressure to be indicated.

The object of this invention is to provide convenient and reliable means for accurately
25 adjusting the rack in relation to the pinion both in the process of manufacture and in its subsequent use, and to effect said adjustment without disturbing the rack from its concentricity with its pivot, and thus maintaining a
30 perfect engagement of the rack and pinion throughout the length of the rack in the adjustment thereof; and to that end the invention consists in the novel construction and combination of parts hereinafter described,
35 and set forth in the claims and illustrated in the annexed drawings, in which—

Figure 1 is a side view of an adjustable rack-and-pinion mechanism embodying my invention. Fig. 2 is a front view of the same.
40 Figs. 3 and 4 are transverse sections respectively on lines 3-3 and 4-4 in Fig. 2, and Fig. 5 is an enlarged detached perspective view of the axial support of the segmental rack.

Similar letters of reference indicate corresponding parts.

50 *a* and *b* represent the main members of the frame, which support the rack-and-pinion mechanism. Said members consist of two metal plates rigidly secured to each other by a transverse tie *c* and arranged to sustain the pinion *p* between them. Said pinion is fas-

tened to a sleeve *p'*, which is disposed transversely between the frame members *a* *b* and abuts with its ends against the inner sides of said members. This sleeve is rigidly secured
55 to the shaft or spindle *d*, passing longitudinally through said sleeve and pivoted in said frame members. To one end of the spindle is attached the indicator or pointer which traverses the graduated dial of the steam or
60 water gage. (Not shown.)

From the frame members *a* *b* extend, respectively, rigid arms *a'* and *b'*, which are parallel side by side and preferably formed integral with the frame members *a* *b*. To
65 the arm *a'* is clamped a bracket *e*, which is provided with a slot *e'*, extending in a radial direction toward the shaft *d* of the pinion and receiving through it binding-screws *ff*, which engage screw-threaded holes in the arm *a'*
70 and clamp the bracket adjustably on said arm. To the free end of the bracket *e* is rigidly attached one end of the shaft *g*, which is thereby sustained parallel with the shaft *d*. The free end of said shaft passes through
75 a slot *i* in the arm *b'*, which slot serves to sustain the shaft laterally and is extended toward the shaft *d* to allow the shaft *g* to be moved in said direction, for the purpose
80 herein presently described.

On the shaft *g* is mounted loosely a sleeve *g'*, which abuts with its ends against the inner sides of the two arms *a'* *b'*, as shown in Fig. 2 of the drawings, and is thus confined
85 longitudinally on the shaft *g*. To the sleeve *g'* is rigidly attached the hub of the segmental rack *h*, which engages the pinion *p*. The said rigid attachment of the hub to the sleeve retains the rack uniformly in concentricity with its axis. A longitudinally-slotted arm *l* straddles the sleeve *g'* and is adjustably clamped on the segment *h* by a screw *l'*,
90 passing through the slot of the arm *l* and engaging a screw-threaded hole in said segment.

To the free end of the arm *l* is connected a
95 rod *n* or other suitable means actuated by either a float on the water, the height of which is to be gaged, or by a piston or other device moved by the pressure of the steam of a boiler.

The essential feature of my invention resides in the adjustability of the segmental
100 rack *h* in relation to its engagement with the

pinion *p*, so as to take up or compensate for the wear on said parts without varying the distance between the rack and its axis, thus maintaining the rack in perfect working condition in its aforesaid adjustment. Said adjustment is effected by loosening the screws *ff*, so as to allow the bracket *e* to be shifted toward the shaft *d* of the pinion, and thereby carry the rack *h* into proper engagement with said pinion. By then tightening the screws *ff* the rack is retained in its adjusted position.

What I claim as my invention is—

1. The combination with the supporting-frame and the pinion mounted thereon, of an arm extending from said frame at right angles to the axis of the pinion, a bracket connected to said arm adjustably toward said axis, means for clamping said bracket in its adjusted position on the arm, a shaft extending from said bracket parallel with the axis of the pinion, and a segmental rack mounted

on said shaft and retained permanently in concentricity therewith as set forth.

2. The combination, with the pinion, of its supporting-frame consisting of two plates sustaining between them the axis of the pinion, a main supporting-arm extending rigidly from one of said plates and a supplemental arm extending from the other of said plates, and provided in its free end with a slot extending radially toward the axis of the pinion, a bracket connected to the main supporting-arm adjustably toward the axis of the pinion, a shaft parallel with said axis and fastened at one end to said bracket and having its opposite end sustained laterally in the slot of the supplemental arm, and a segmental rack mounted loosely on said shaft and engaging the pinion as set forth and shown.

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Witnesses:

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