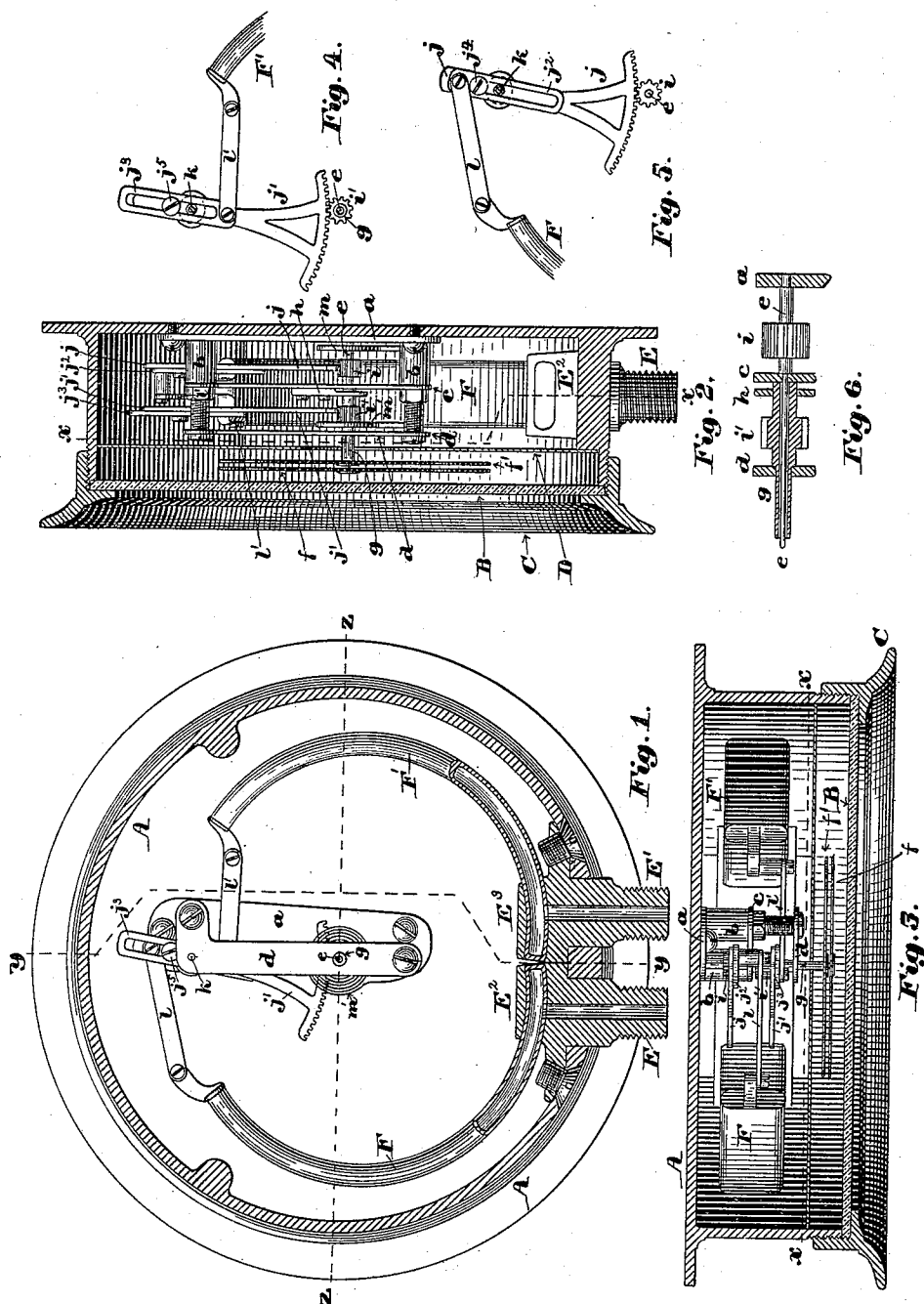


(No Model.)

F. H. HASKELL.
 DUPLEX PRESSURE GAGE.

No. 471,383.

Patented Mar. 22, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

FRANK H. HASKELL, OF REVERE, MASSACHUSETTS.

DUPLEX PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 471,383, dated March 22, 1892.

Application filed May 9, 1891. Serial No. 392,169. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. HASKELL, of Revere, in the county of Suffolk and State of Massachusetts, have invented certain new and
5 useful Improvements in Duplex Pressure-Gages, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to duplex pressure-gages, and particularly to the mechanism for
10 operating two index-fingers moving independently about a common axis; and it consists in certain novel features of construction, arrangement, and combination of parts, which
15 will be readily understood by reference to the description of the drawings and to the claim hereinafter given, and in which my invention is clearly pointed out.

Figure 1 of the drawings is a sectional elevation of a pressure-gage embodying my invention, the cutting plane being on line *xx*
20 on Figs. 2 and 3. Fig. 2 is a sectional elevation, the cutting plane being on line *yy* on Fig. 1. Fig. 3 is a section of the casing and
25 dial on line *zz* on Fig. 1 and showing the interior works in plan. Fig. 4 is an elevation of the outer segment and pinion and the means of adjustably connecting it to the pressure-operated spring-tube. Fig. 5 is a
30 similar view of the inner segment and pinion and its operating devices; and Fig. 6 is a section through the index-carrying sleeve and frame for supporting said sleeve and the index-carrying spindle on line *zz* on Fig. 1 and
35 showing said spindle and its operating-pinion in elevation.

Heretofore duplex pressure-gages have been constructed with two spring-tubes occupying
40 different planes—that is, one being outside of the other or farther from the base of the casing—each of said spring-tubes being fixed at the center of its length and extending from said fixed support both to the right and left
45 in an arc of a circle to near the top of the chamber of the casing and connected at both of its ends through the medium of suitable links and levers to the same index-operating segment upon opposite sides of its axis. This arrangement is objectionable on account of
50 the increased depth of the casing and the consequent increased space occupied by the gage as compared with a single index-gage.

In the duplex gages now in common use the two index-fingers are mounted one upon a spindle and the other upon a sleeve surround-
55 ing and fitting said spindle and having its principal bearing therein. This has been found to be objectionable, for the reason that the friction created between said spindle and sleeve was sufficient to affect the accuracy of
60 the indications of the pressures given by the index-fingers.

To obviate the above objections is the purpose of my invention.

In the accompanying drawings, A is the
65 casing, provided with the glass B, the glass-supporting ring C, and the dial D and having secured therein the two independent inlet-pipes E and E'. The pipe E communicates with the interior of the spring-tube F,
70 firmly secured at one end in the pipe-head E² and extending in an arc of a circle parallel, or nearly so, to the wall of the casing at the left of said pipe E. The pipe E' in like manner communicates with the interior of the spring-
75 tube F', which is secured in the pipe-head E³ and extends therefrom to the right of said pipe-head and at the same distance from the back and front of the casing as the spring-tube F, or, in other words, the two spring-tubes
80 F and F' occupy the same vertical plane in the casing. A frame-work composed of the base-plate *a*, the posts *b b*, and the bars *c* and *d* is secured to the back of the casing in a position central between said spring-tubes,
85 as shown. A spindle *e* is mounted in bearings in the base-plate *a* and the bar *c* and carries at its upper end the index-finger *f*. A sleeve *g* surrounds the upper portion of the
90 spindle *e* without coming in contact with it and has its bearings in the bar *d* and the short plate *h*, secured upon the upper side of the bar *c*, the lower end of said sleeve resting upon the bar *c*, all as shown in Fig. 6, and carries at its upper end the index-finger *f'*, as
95 shown in Figs. 2 and 3. The spindle *e* has formed upon or secured thereto the pinion *i*, with which the gear-segment *j*, mounted upon and movable about the fixed spindle or shaft
100 *k*, engages, as shown in Figs. 2 and 5, and the sleeve *g* has formed upon or secured thereto the pinion *i'*, with which the gear-segment *j'*, mounted loosely upon the shaft *k*, engages, as shown in Figs. 2 and 4. The segments *j* and

5 j' have secured thereto so as to be adjustable thereon the slotted plates j^2 and j^3 , respectively, which are firmly secured in adjusted position thereon by the clamping-screws j^4 and j^5 , respectively. The movable end of the spring-tube F is connected by the link l to the plate j^2 at that side of the axis of the segment j opposite to the pinion i , (see Fig. 5,) and the movable end of the spring-tube F' is
 10 connected by the link l' to the plate j^3 between the axis of the segment j' and the pinion i' , all as shown in Fig. 4. Two springs m and m' are connected, respectively, to the spindle e and the sleeve g for taking up the
 15 "backlash" or lost motion between the teeth of the segments and the pinions operated thereby.

By the construction and arrangement of the parts as above described a very effective duplex gage is produced at a considerable less
 20 cost than those now in use, with the further advantage of occupying much less space, and the accuracy of the indications of which are unaffected by friction between the spindle
 25 carrying one index-hand and the sleeve which carries the other index-hand.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

30 In a duplex pressure-gage, the combination, with the casing and dial, of two independent index-fingers mounted one upon a spindle

and the other upon a sleeve surrounding said spindle without contact therewith, two pinions mounted one upon said spindle and the other upon said sleeve, two gear-segments
 35 mounted upon a common arbor, one above the other, and engaging said pinions, two independent inlet-pipes arranged side by side, with their axes in a plane parallel with the back of the casing, two independent segmental spring-tubes, each connected by one end
 40 to one of said inlet-pipes and communicating therewith and projecting therefrom in opposite directions and at the same distance from the back of the casing, a link connecting the
 45 movable end of one of said spring-tubes with the segment for operating one of said index-fingers between its axis of motion and the axis of the index-fingers, and a similar link
 50 connecting the movable end of the other spring-tube with the segment for operating the other of said index-fingers at the side of its axis opposite to the axis of the index-fingers.

In testimony whereof I have signed my
 name to this specification, in the presence of
 two subscribing witnesses, on this 8th day of
 May, A. D. 1891.

FRANK H. HASKELL.

Witnesses:

N. C. LOMBARD,

WALTER E. LOMBARD.