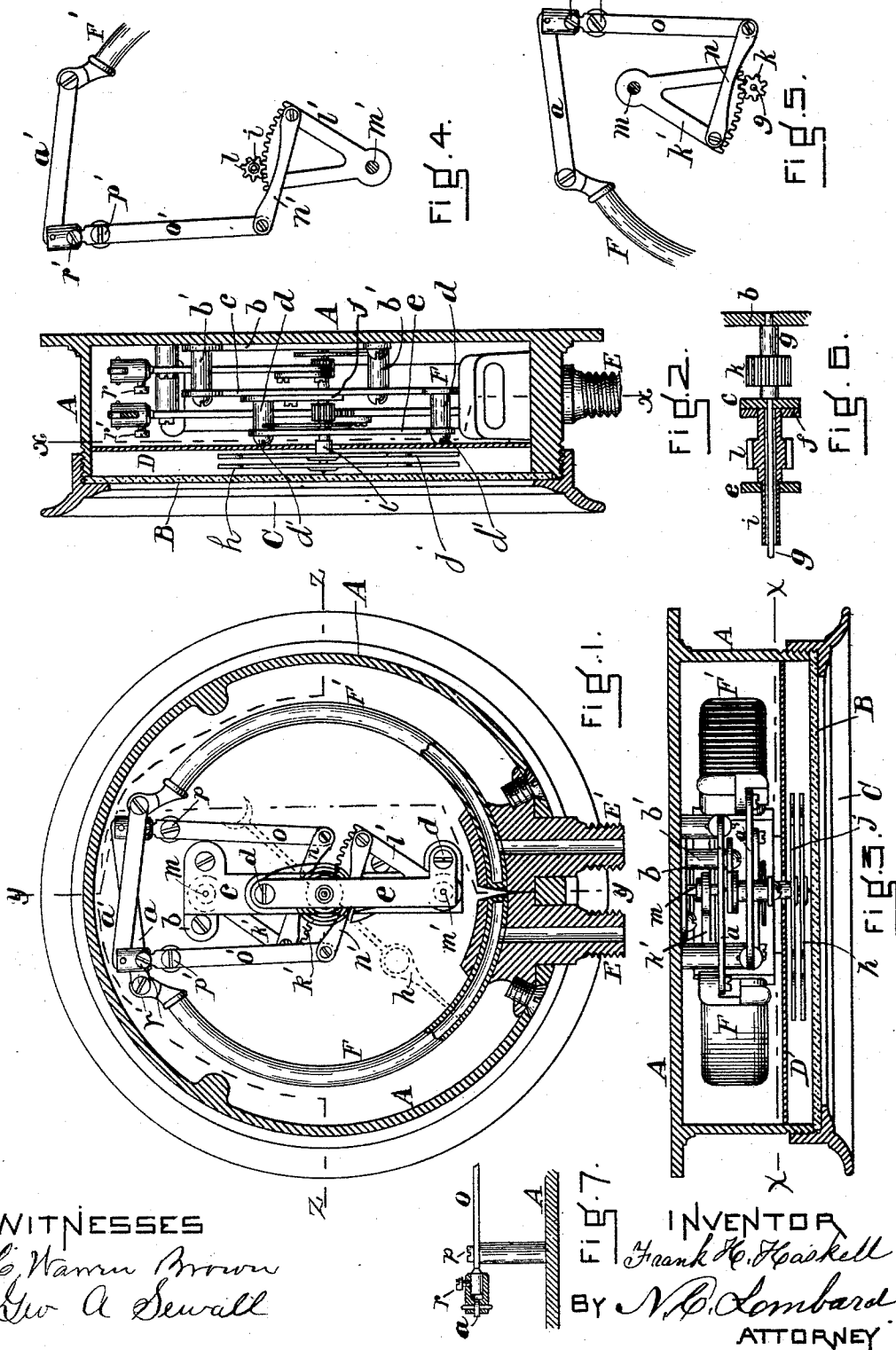


(No Model.)

F. H. HASKELL.
 DUPLEX PRESSURE GAGE.

No. 483,613.

Patented Oct. 4, 1892.



WITNESSES

C. Warren Brown
 Geo A Sewall

FIG. 7.

INVENTOR

Frank H. Haskell

BY N. B. Lombard
 ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK H. HASKELL, OF REVERE, MASSACHUSETTS.

DUPLEX PRESSURE-GAGE.

SPECIFICATION forming part of Letters Patent No. 483,613, dated October 4, 1892.

Application filed May 26, 1892. Serial No. 434,504. (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 a new and useful Improvement in Duplex Pressure-Gages, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to pressure-gages, and to that particular class of such gages as are adapted to indicate upon the same graduated scale the pressures in two different receptacles, and is an improvement upon the invention shown and described in the Letters Patent No. 471,383, granted to me March 22, 1892; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings, and to the claims 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 $x x$ on Fig. 3. Fig. 2 is a sectional elevation, the cutting-plane being on line $y y$ on Fig. 1. Fig. 3 is a sectional plan, the cutting-plane being on line $z z$ on Fig. 1. Fig. 4 is a detail showing in elevation a portion of the right-hand spring-tube and the mechanism through which the motion of the free or movable end of said tube is transmitted to the index-carrying sleeve. Fig. 5 is a similar view of a portion of the movable end of the left-hand spring-tube and the mechanism for operating the index-carrying spindle. Fig. 6 is a vertical section through the index-carrying sleeve, its pinion, and bearings and showing the index-carrying spindle and its pinion in elevation; and Fig. 7 is a sectional elevation of one of the levers for operating the index-operating segments and illustrating how the short arm of said lever may be lengthened or shortened to regulate the movement of the index.

In the accompanying drawings, A is the main body of the 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', communicating, respectively, with the spring-tubes F and F', which are connected thereto by one

end and project therefrom in opposite directions and curved to arcs of circles, with their inner edges at the same distance from the back of the casing, all substantially as shown and described in my before-cited Letters Patent.

In said prior patent motion was imparted to the index-carrying spindle and sleeve from the spring-tubes by means of two segments arranged one over the other and movable about the same axis, and in order to move both index-fingers in the same direction it was necessary that the connection of the free or movable ends of the spring-tubes to said segments should in one case be between the fulcrum of said segment and the pinion and in the other case at the side of said fulcrum opposite to the pinion with which the segment engages, the consequence of which was that the leverages of the two spring-tubes were not equal, thereby necessitating greater and more delicate adjustments. In my present invention I make the lengths of the two spring-tubes F and F' from the points where they leave the socketed inner ends of the inlet-pipes E and E' to the center of the pins connecting the links $a a'$ thereto just equal. A framework comprising the plate b , the posts $b' b'$, and the plate c is secured to the back of the casing in a central position between said spring-tubes, as shown. In the plate c is secured the two posts $d d'$, to the tops of which is secured by the screws $d' d'$ the plate e , and a fourth plate f is secured upon the upper side of the plate c , as shown in Figs. 2 and 6. A spindle g has its bearings in the plates b and c and carries at its upper end the index-finger h , and surrounding said spindle without touching it is the sleeve i , having its bearings in the plates e and f and carrying at its upper end the index-finger j , this arrangement of the spindle-sleeve and index-fingers being substantially the same as in my before-cited prior patent. The spindle g has formed thereon or secured thereto the pinion k , with which the teeth of the segment k' engage to impart to said spindle a reciprocating or oscillating motion about its axis, and the sleeve i is provided with a similar pinion l , with which the segment l' engages to impart to said segment a similar motion about its axis. The segments k' and l' are arranged upon opposite sides of the spindle g and sleeve i and

are mounted upon independent shafts or pivots at m and m' , the former having its bearings in the plates b and c and the latter in the plates c and e . The segment k' has
 5 pivoted thereto one end of the link n , the opposite end of which is pivoted to the movable end of the long arm of the lever o , mounted upon a fixed fulcrum at p and having the
 10 movable end of its short arm connected by the link a to the movable end of the spring-tube F , as shown in Figs. 1 and 5. In like manner the segment l' is connected by the link n' to the movable end of the long arm of the lever o' , mounted upon a fixed fulcrum
 15 at p' and having the movable end of its short arm connected by the link a' to the movable end of the spring-tube F' . The short arms of the levers o and o' are each made in two parts, which are adjustable one upon the
 20 other to increase or decrease their lengths, the two parts being clamped in the adjusted positions by means of the set-screws r and r' , respectively, as shown in Figs. 1, 2, 4, 5, and 7. The links n and n' are pivoted each to its
 25 segment k' or l' at a point near the teeth thereof and at the edge of said segment in each case farthest from the lever o or o' , to which its opposite end is pivoted, as shown in Figs. 4 and 5. The segments k' and l' are
 30 duplicates of each other, as are also the two levers o and o' , the two links a and a' , and the two links n and n' .

By the construction and arrangement of the spring-tubes and the transmitting mechanism connecting said tubes with the index-fingers, as shown and described, a uniform and equal movement of the two index-fingers will be obtained with the same pressure in both spring-tubes. The transmitting mechanism is more sensitive to the movements of the
 40 spring-tubes, and I am enabled to use spring-tubes nearly or quite one gage heavier than with the movement shown and described in my prior patent before cited, thereby rendering the gage much more durable.
 45

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

1. In a pressure-gage having two independently-operated index-fingers movable about a
 50 common axis, two independent inlet-pipes,

and two independent spring-tubes of equal lengths connected one to each of said inlet-pipes by one end and projecting therefrom in opposite directions, the combination, with said parts, of an index-carrying spindle, a
 55 pinion mounted thereon, an index-carrying sleeve surrounding a portion of said spindle, a pinion on said sleeve, a pair of toothed segments mounted and movable about independent
 60 axes upon opposite sides of said spindle and sleeve and constructed and arranged to engage one with the spindle-pinion and the other with said sleeve-pinion, a pair of two-armed levers mounted upon independent
 65 fixed fulcrums, a pair of links connecting the short arms of said levers to the movable ends of said spring-tubes, one to each, and a pair of links connecting the long arms of said levers to said segments, one to each, said connections to the segments in each case being
 70 between the fulcrum of the segment and the pinion with which it engages.

2. In a duplex pressure-gage, the combination of the casing A , the dial D , the two inlet-pipes E and E' , the two independent spring-tubes F and F' , the spindle g , the pinion k ,
 75 and index-finger h , carried by said spindle, the sleeve i , surrounding said spindle, the pinion l and index-finger j , carried by said sleeve, the segments k' and l' , mounted upon independent
 80 axes on opposite sides of said spindle and sleeve, the levers o and o' , mounted on independent fixed fulcrums and having their short arms constructed and adapted to be adjusted to greater or less lengths, the
 85 links a and a' , connecting the short arms of said levers o and o' , respectively, to the movable ends of the spring-tubes F and F' , and the links n and n' , connecting the long arms of said levers o and o' to the segments k' and
 90 l' , respectively, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 19th day of May, A. D. 1892.

FRANK H. HASKELL.

Witnesses:

N. C. LOMBARD,
 A. D. SIMPSON.