(No Model.)

S. R. SCHARF.

APPARATUS FOR WEIGHING ASPHALT.

No. 480,141. Patented Aug. 2, 1892.

Fig. 1.

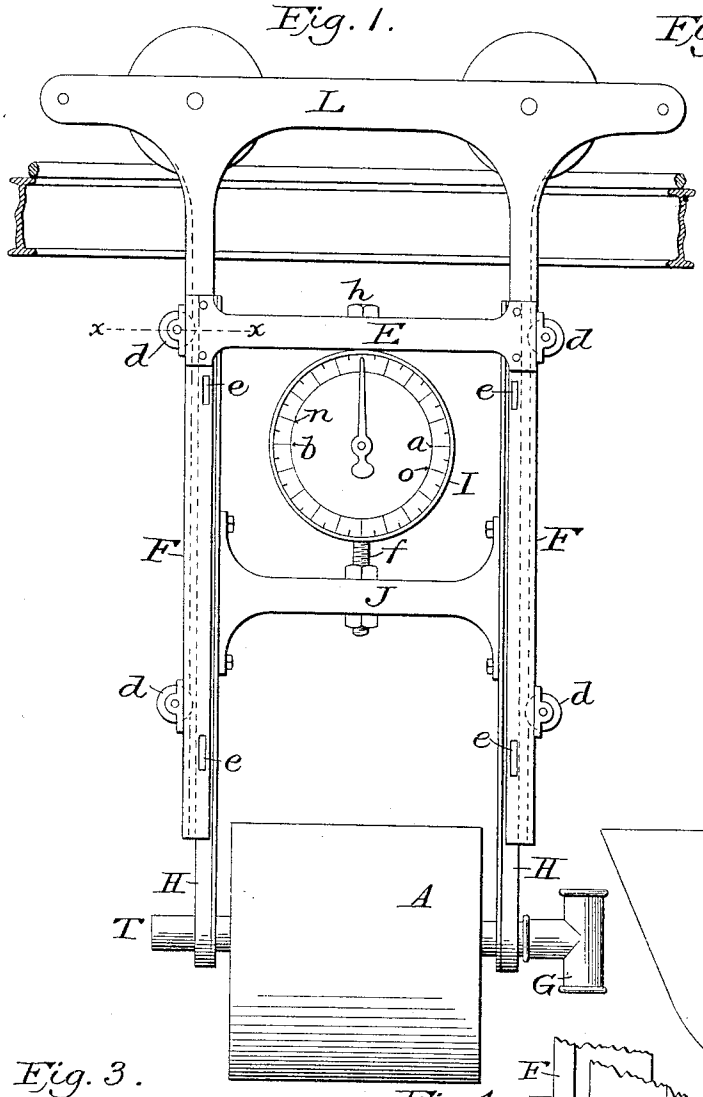


Fig. 2.

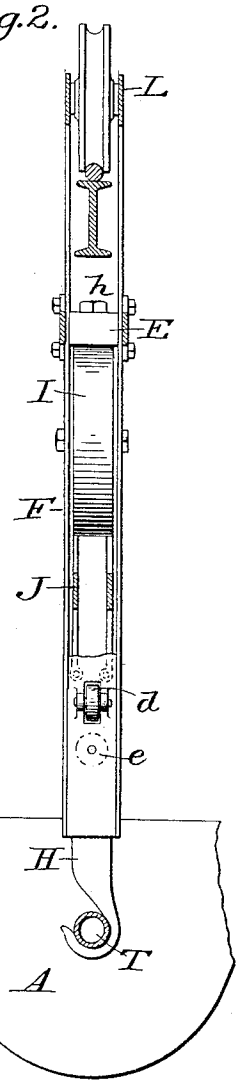


Fig. 3.

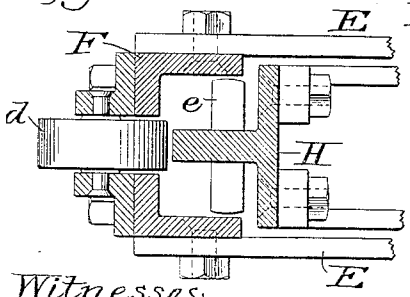
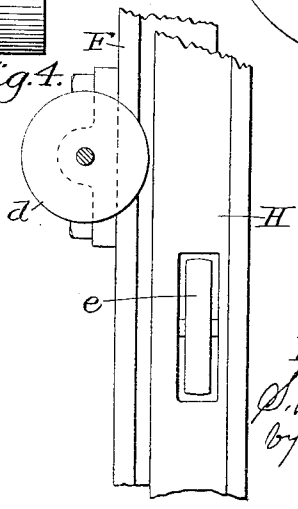


Fig. 4.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR WEIGHING ASPHALT.

SPECIFICATION forming part of Letters Patent No. 480,141, dated August 2, 1892.

Application filed April 4, 1892. Serial No. 427,710. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL R. SCHARF, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Apparatus for Weighing Asphalt, of which the following is a specification.

My present invention relates to the apparatus used in the preparation of the asphalt compounds or mixtures for street-pavements; and it consists of a traveling and dumping bucket provided with a scale so arranged as to indicate by weight the exact quantity of the asphalt used, as hereinafter more fully set forth.

Figure 1 is a front elevation of my weighing-bucket and its traveling frame. Fig. 2 is a side elevation of the same shown partly in section. Fig. 3 is a transverse section on the line x x of Fig. 1, showing in detail the construction of the frame, the view being enlarged. Fig. 4 is a face view of a portion of the frame, also enlarged, with a portion removed to more clearly show the arrangement of the parts.

In the preparation of the mixture of sand or other material and asphalt for street-pavements great difficulty is experienced in endeavoring to secure a perfectly-uniform mixture which shall at all times contain the exact proportions of asphalt required. So difficult has this been found that with all the care possible it frequently happens that one section or part of a pavement the whole of which is laid at the same time and of the same material will break up and go to pieces in a short time, while other portions will remain sound and good; and this variation is liable to occur within a short distance because of the variation in the quantity of asphalt in the mixture and which it is impossible to detect at the time. This difficulty arises, first, from the nature of asphalt, which contains more or less volatile matter that has to be expelled or eliminated by heating or cooking the asphalt, and as asphalt is a tough viscous material the volatile matters which it contains are eliminated with difficulty, depending on the degree of heat applied and the length of time to which it is subjected to the action of the heat and also on the amount of volatile matter which it contains and which is subject to great variation. Hence it is next to impossible to always secure perfect uniformity in the different batches of the asphalt itself when cooked in the tank, some batches retaining more and some less of the volatile material, thus causing it to vary in density, and consequently in quantity of asphalt, when tested by measure.

In practice another and very serious difficulty has been found to exist. It has heretofore been customary to take the hot asphalt from the tank to the mixer by means of a traveling bucket, to the side of which is secured an adjustable gage, which was set at the proper height to indicate how full the bucket should be filled for each separate batch, the quantity thus being indicated by measure. Experience has shown that this method is subject to great variations in the quantity of the asphalt actually delivered to the mixer, and is therefore unreliable. The causes of this variation are, first, the different degrees of heat at which the asphalt stands in the tank at different times and the more or less perfect elimination of the volatile matter from the mass and its consequent density, and, second, the cooling (more or less) of the asphalt while in the bucket, thereby causing sometimes more and sometimes less of it to adhere to the walls of the bucket, and thereby varying the quantity delivered therefrom to the mixing-machine. If the asphalt when placed in the bucket is of a lower temperature and therefore less fluid, more of it will adhere to the walls of the bucket when it is poured therefrom into the mixer, and the quantity thus adhering will increase with each bucketful. Again, a change in the weather from sunshine to cloudiness or the sudden change from a calm to a windy time, and especially if a cool wind springs up during the operation, as frequently happens, the asphalt is cooled and caused to adhere to the bucket, thus lessening the quantity delivered, the reverse changes of course producing the opposite effects and causing an excess to be delivered when the mass adhering to the bucket is rendered more fluid and less adhesive. So, too, it is sometimes necessary to retain the asphalt in the bucket longer before emptying it, owing to some exigency of the work, and thus it becomes cooled, thereby

causing more to adhere to and be retained in the bucket, in which case of course that batch will be deficient in asphalt, and which will materially affect the quality of the pavement made from it. The seriousness of this difficulty will be better understood when I state that the bucket ordinarily contains about one hundred and forty-five pounds of asphalt and that despite the utmost care the quantity delivered to the mixer from the bucket is found in practice to vary from one, two, three, or four pounds up to fifteen pounds, a variation that is fatal in the effort to secure a uniform or perfect pavement. To remedy these difficulties, I mount the bucket A, which conveys the asphalt from the tank to the mixer, on a compound frame having a scale interposed, which shall at all times indicate the weight of the bucket and the adhering asphalt, and which will also indicatein pounds or by weight instead of by measure the quantity of asphalt delivered to the mixer, thus securing the delivery of the exact quantity each time. This compound frame is shown in Figs. 1 and 2, it consisting of a top portion L, having two depending arms F, each arm being formed with a U-shaped recess on its inner face, as shown more clearly in Fig. 3, these two arms being connected by a cross-bar E, and to which cross-bar the scale or weighing apparatus I is secured by a bolt and nut *h*, as shown in Figs. 1 and 2. Within this I arrange a sliding frame composed of two vertical bars H, connected by a cross-bar J, by which this inner sliding frame is attached to the operating part of the scale I by a bolt *f*, as shown, the scale being of the usual or known variety, and therefore unnecessary to be described. The lower ends of these bars H are formed with hooks or eyes, as shown, for supporting the bucket A, which is provided with trunnions, which for convenience are formed by the projecting ends of a shaft or tube T, extending through the bucket and having a T-socket G attached at either end for the insertion of a handle or bar for tipping the bucket when it is desired to empty it, the trunnions of course being so located that the bucket will normally remain in an upright position.

To prevent the friction of the two frames from interfering with the operation of the scale, I make the bars H of the inner frame of T form in cross-section, as shown in Fig. 3, the central ribs of these bars fitting loosely in the recesses in the inner faces of the outer frame or arms F with a considerable space between them, so that they shall nowhere come in contact. I then cut slots in the rib of each of the T-shaped bars H, one near each end, and fasten therein rollers *e*, as shown in Figs. 3 and 4 and in dotted lines in Figs. 1 and 2, these rollers bearing against the inner side faces of the arms F in case they touch at all. In like manner I provide openings in the outer bars or arms F and mount therein another set of rollers *d*, as shown in Fig. 1, the peripheries of these rollers coming opposite the face of the rib of the inner frame or bars H, as shown clearly in Figs. 3 and 4. By this arrangement the two frames are prevented from touching each other, the only contact being through the two sets of rollers *d* and *e*, thus preventing any friction between the two frames and permitting the inner frame, which supports the bucket, to play freely up and down and operate the index or pointer of the scale without obstruction or interference. With the parts thus arranged it will be seen that the weight of the empty bucket will move the pointer around a certain distance, which, for illustration, I will suppose to be at the point *a*, where it will remain stationary. If now the bucket be filled with the required quantity of hot asphalt for a batch—say one hundred and forty-five pounds—of course the index will be moved still farther—say to the point *b*. When the bucket is emptied, more or less of the asphalt will adhere to it, so that the index will not return to the point *a*, but will stop short of that point, according to the weight of the adhering asphalt—say to the point *o*—which, if the marks on the scale indicate five pounds each, would be ten pounds. Consequently when the bucket is filled next time sufficient must be put in to carry the index an equal distance beyond the point *b* to the point *n* in order to secure the required weight of asphalt, and so on for every change there may be in the quantity adhering to the bucket each time it is emptied. By this it will be seen that it makes no difference how much volatile matter there may be in the asphalt, (and which when heated is in the form of bubbles,) nor how much variation there may be in the quantity adhering to the bucket, the attendant by observing the scale can at all times deliver to the mixer the exact quantity required, and that by weight instead of by measurement or bulk, as heretofore. By these means the mixture can be made perfectly uniform regardless of changes in the weather, a result hitherto impossible with the means formerly used. By securing uniformity in the composition or mixture a perfectly uniform quality of pavement can be obtained, provided all other conditions are equal.

The manner shown of mounting the frame on wheels on a rail extending from the tank to the mixer is the same as that now in use, and therefore need not be described.

Having thus fully described my invention, what I claim is—

1. A conveyer for asphalt or similar adhesive material, consisting of a frame adapted to be moved on a rail, with a secondary sliding frame adapted to support a bucket, the two frames being connected by an interposed scale, substantially as shown and described, whereby the weight of the material placed in the bucket and also the weight of the vary-

ing adhering amount of material remaining in the bucket are automatically indicated at each operation, as set forth.

2. The herein-described apparatus for conveying and automatically indicating the weight of asphalt or similar material, the same consisting of a suspended frame having pendent arms F and a sliding frame H H, adapted to support a bucket, the two frames being connected by an interposed scale and each provided with anti-friction rollers, all constructed and arranged to operate substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

SAML. R. SCHARF.

Witnesses:
HORACE A. DODGE,
ROBT. L. MILLER.