

S. GOODBAUDY.
SPRING SCALE.

(Application filed June 16, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

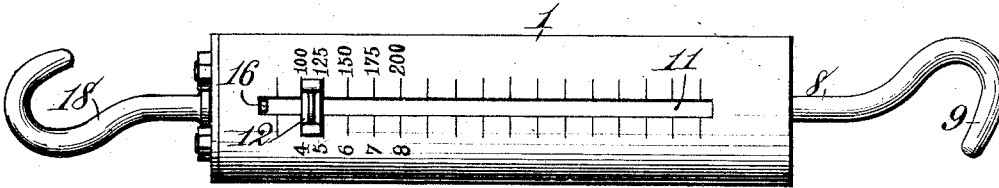


Fig. 2.

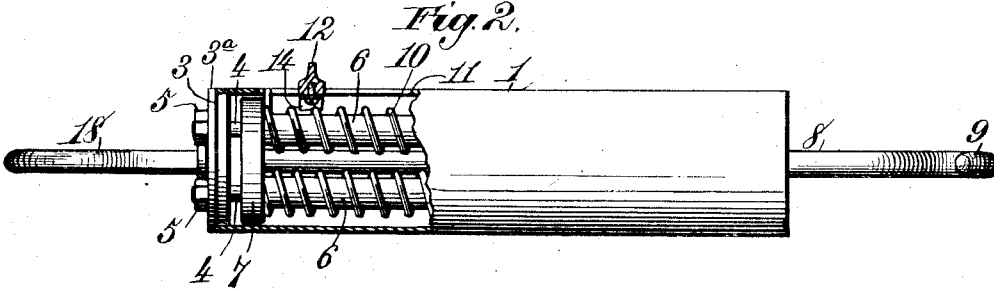


Fig. 3.

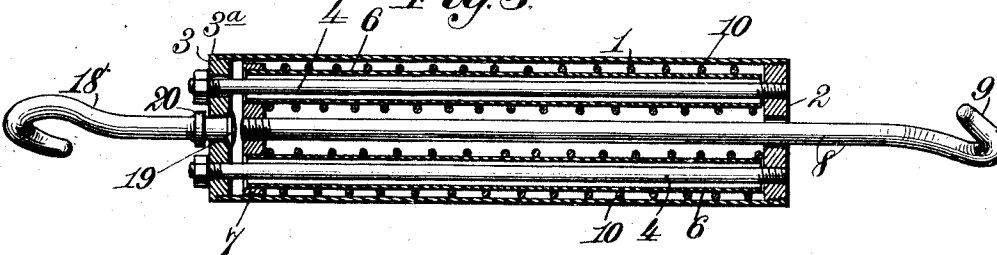
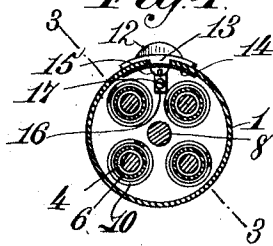


Fig. 4.



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No. 629,290.

Patented July 18, 1899.

S. GOODBAUDY.
SPRING SCALE.

(Application filed June 16, 1898.)

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2 Sheets—Sheet 2.

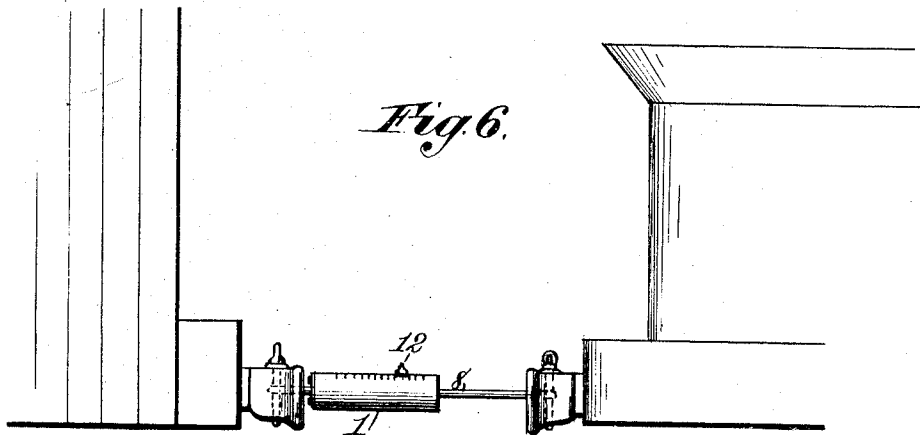
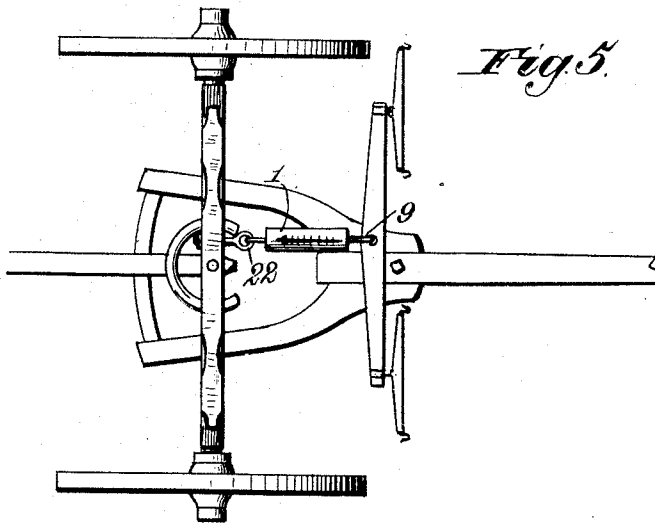
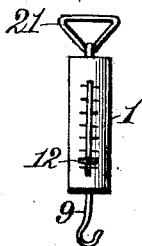


Fig. 7.



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UNITED STATES PATENT OFFICE.

SAMUEL GOODBAUDY, OF MIAMI, INDIAN TERRITORY, ASSIGNOR OF ONE-EIGHTH TO JOSEPH E. TINCHER, OF DANVILLE, ILLINOIS.

SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 629,290, dated July 18, 1899.

Application filed June 16, 1898. Serial No. 683,608. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL GOODBAUDY, a citizen of the United States, residing at Miami, in the county of Peoria, Indian Territory, have invented new and useful Improvements in Spring-Scales, of which the following is a specification.

This invention relates to spring-scales, and has for its object to provide scales of the character described by means of which the weight of a load placed on a wagon or car can be quickly ascertained by measuring the force or power necessary to overcome the inertia of the wagon or car to move the same or by means of which articles in bulk—such as baled cotton, for example, or articles of less weight, as household supplies—may be readily weighed and the weight automatically registered.

With these ends in view my invention consists in the features and in the construction, combination, and arrangement of parts hereinafter described, and particularly pointed out in the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a view in side elevation of my improved scales. Fig. 2 is a similar view, partially in section, taken at a right angle to Fig. 1. Fig. 3 is a longitudinal sectional view taken on the line 3 3 of Fig. 4. Fig. 4 is a transverse sectional view. Fig. 5 is a top plan view of a part of a wagon, showing the scales applied thereto. Fig. 6 is a view in side elevation showing the scales applied to a car, and Fig. 7 is a detail view showing the invention arranged as hand-scales.

I will first describe the construction of my improved scales, and will then explain the manner in which articles or loads are weighed and automatically registered.

Referring to the drawings, the numeral 1 indicates a hollow cylinder, which is interiorly threaded at one end, and screwed into said threaded end is a head 2. In the other end of the cylinder 1 is fitted a head 3, provided with a circumferential flange 3', that bears against the end of the cylinder. Formed in the head 2 at uniform distances apart is a plurality of threaded bolt-holes, into each of which is screwed one end of a tie-bolt 4, the

other end of which projects through the head 3 and has screwed thereon a nut 5. The tie-bolts 4 operate to firmly tie or fasten together the heads 2 and 3 in the cylinder. Arranged about each of the tie-bolts 4 is a tubular guide 6, one end of which bears against the head 2 and the other end passes loosely through a perforation formed in the follower 7. The follower 7 consists of a metallic disk suitably perforated for the passage of the tubular guides 6, and screwed centrally in said disk or follower is a rod 8, which passes through a central aperture in the head 2 and at its extremity is bent to form a hook 9. Disposed about each of the tubular guides 6 is a coiled spring 10, one end of which bears against the head 2 and the other end bears against the follower 7.

A slot 11 is formed longitudinally in the cylinder 1, and arranged to slide in said slot is an index consisting of a metallic block 12, arranged to span said slot and formed on its inner side with a rectangular flange or projection 13, constructed to fit snugly in the slot, but adapted to freely move longitudinally therein, whereby the index is caused to move in a true right line. A leaf-spring 14 is attached to the inner side of the projection 13 by a screw 15 and bears at its opposite ends against the inner side of the cylinder 1 on each side of the slot, said spring acting as a clamp to hold the index fixed at any point to which it may be moved. A finger 16 is attached by a screw 17 to the under side of the follower 7 and projects beyond the periphery of the latter into the slot 11 above the index 12. Swiveled in the head 3 is a hook 18. The hook 18 may be conveniently swiveled in the head by forming a countersunk aperture centrally in the head and upsetting or heading down the end 19 of the hook therein, as shown, said hook turning freely in the head 3, but is prevented from having any endwise movement therein by the headed end 19 and a collar 20, formed on the hook on the outer side of the head 3.

As shown, the finger 16 is unattached to the index 12. Hence when a weight or tractional force is applied to the hook 9 and the springs are compressed by the follower the

finger 16 will move the index-block to the graduation marked on the periphery of the cylinder to indicate the weight or power applied to the scales; but when the weight or power is disengaged from the scales and the springs expand and return the follower the index remains at the point to which it had previously been moved by the follower and is held against accidental displacement by the spring 14, thus automatically registering the weight. After the indication has been read the index may be returned to zero by hand.

In small scales intended for domestic use and the like instead of the hook 18 I provide a handle 21, as shown in Fig. 7, for the purpose hereinafter explained.

The operation of my improved scales is as follows: I have ascertained by practical experiment that the force necessary to overcome the inertia and move an ordinary wagon on a smooth and approximately level surface is equivalent to a lifting force of four pounds for each one hundred pounds of the total weight of the wagon. For example, if the wagon has a total weight of two thousand pounds then the tractional force or power necessary to move the wagon on such a surface as I have described will be equivalent to a force or power necessary to lift eighty pounds. When the scales are to be used as wagon-scales, therefore, I provide the cylinder on one side of the slot with a series of graduations indicating the actual weight or power exerted on or sustained by the scales and a corresponding series of graduations on the opposite side of the slot indicating the weight multiplied by twenty-five, or the total actual weight of the wagon. Let it be assumed that the weight of a load about to be placed upon a wagon is to be ascertained. For this purpose I provide a portable platform or tram-rails that may be carried on the wagon to the point where the load is to be put upon the wagon. The platform is then placed upon the ground in an approximately level position and the empty wagon driven thereon. An eyebolt 22 having been previously attached to the wagon-bolster the hook 18 is engaged therewith, and the doubletree is engaged with the hook 9. The team is now started up until the inertia of the wagon is overcome and the wagon starts to move, when the team is stopped. In moving the wagon the springs in the scales are compressed until they are capable of resisting the force necessary to move the wagon, or, in other words, until the index indicates a resistance corresponding to the weight of the wagon, which, as I have before explained, will be four pounds for each one hundred pounds of the total weight of the wagon. For example, if the wagon weighs two thousand pounds the scale will indicate on one of the series of graduations a pulling or tractional force equal to eighty pounds, while the corresponding graduation on the other side of the slot will

indicate the corresponding weight of the wagon, or two thousand pounds. The load is then placed upon the wagon and the operation repeated, and the difference between the weight of the wagon empty and loaded will be the total weight of the load.

It is important to note that after the wagon's inertia has been overcome and the wagon is in actual motion the scales will not correctly indicate the exact force necessary to move the wagon from a state of rest, owing to the acquired momentum. Hence it is necessary to read the indicated weight or force on the scale the precise moment the wagon starts to move. This, however, is impractical or difficult, if not actually impossible; but by means of my improved index, constructed as described, it will automatically remain fixed when the springs have been compressed and indicate the maximum weight or force exerted, which is the weight or force necessary to impart the initial movement to the wagon, so that no especial care or watchfulness is necessary to read the indicated weight at the precise time it is exerted, as it may be read at any time thereafter when most convenient.

The same principle of operation is involved in weighing a load placed upon a railway-car. I have found by experiment that the tractional force or power necessary to overcome the inertia and move an ordinary railway-car upon an approximately level track is equivalent to a lifting force of six pounds for each one hundred pounds of the total weight of the car. Hence when the scales are designed for use as car-scales the graduations marked on one side of the slot 11 will be arranged to indicate the actual weight or power exerted on the scales as before, while the graduations on the opposite side of the slot will be multiplied by 16.66 to indicate in hundreds of pounds the corresponding weight of the car. To weigh the load, the hook 18 is engaged with the car-coupling at one end of the empty car, and the engine is coupled to the hook 9 and started ahead until the car commences to move, when it is stopped, and the force or power necessary to move the car from a state of rest is then read as automatically indicated by the index 12. For example, if said index points to an indicated force or power of three thousand pounds on one side of the slot the corresponding graduation on the opposite side of the slot will indicate eighteen thousand pounds, which will be the actual weight of the car. If, now, the load be placed upon the car and the operation repeated, it will only be necessary to subtract the ascertained weight of the car from the total weight indicated and the remainder will be the actual weight of the load placed upon the car.

It will be manifest that the scales may, if so desired, form a part of the permanent equipment of the car, in which case the scales will be fixed centrally to the under side of the car and arranged in such manner that the engine

may be coupled thereto from either end of the car. The scales will also prove a most ready, convenient, and accurate means for measuring the weight of merchandise and

5 products on farms, plantations, warehouses, and the like, as it is only necessary to engage the hook 9 with the slings or grapples commonly employed for lifting such articles—as a bale of cotton, for example—and connect the
10 hook 18 with a hoisting or lifting device of any kind, when by simply lifting the bale very slightly from the floor or its support the index will automatically register the weight thereof, and the indicated weight may be read
15 at leisure and with certainty after the bale has been lowered. Furthermore, by reducing the size of the scales and substituting a handle 21 for the hook 18, as shown in Fig. 7, the invention will be especially adapted for
20 domestic and similar uses, it merely being necessary to engage the hook 9 with the article to be weighed and lift it by the handle 21, and after the article has been lowered or released from the scales the weight may be read
25 at ease and with accuracy, a difficult thing to do with the ordinary scales, as the indicated weight with such scales has necessarily to be read while the scales and the article being weighed are held suspended.
30 The construction of the scales for the different purposes described is the same, excepting that a handle is substituted for the hook 18 when the scales are designed for weighing small articles or articles of comparatively light weight. It will also be evident
35 that the size and strength of the scales will be proportionate to the work they may be called upon to perform and also that the ratio between the two series of graduations will be dependent upon the purpose for which the scales
40 may be designed, as has been before described. In each instance, however, the index will automatically register the weight or tractional force exerted on the scales and the
45 springs will measure such weight or force with accuracy and certainty, as said springs are compressed in a true right line, being guided in their flexure by the guide-tubes 6, causing each convolution of the springs to
50 remain in perfect alinement with the convolutions above and below, whereby the springs are held out of contact and prevented from interfering with one another in their operation.

55 The scales constructed as described are

simple and not easily put out of order and possess exceeding strength and durability.

Having described my invention, what I claim is—

1. In spring-scales, the combination with a 60 cylindrical casing having heads fixed in its opposite ends, of a follower arranged to freely move in said cylinder and having a plurality of perforations, a hooked rod freely passing through one of said heads and fixed at its 65 inner end to said follower, a plurality of tubular guides bearing at one end against said head and at their other ends loosely passing through the perforations in the follower, coiled springs disposed about said tubular guides 70 between the said head and the follower, and a movable index actuated by the follower, substantially as described.

2. In spring-scales, the combination with a 75 cylindrical casing having heads fitted in the opposite ends thereof, of tie-bolts connecting said heads together, tubular guides disposed about said tie-bolts, a perforated follower arranged to freely slide in the cylinder over said 80 tubular guides, coiled springs disposed about said tubular guides between the follower and one of the heads, a hooked rod freely passing through the said head and attached at its inner end to the follower, and a movable index 85 actuated by the follower, substantially as described.

3. In spring-scales, the combination with a cylindrical casing having a head screwed into one end and a flanged head fitted over the opposite end, of a plurality of tie-rods screwed 90 at one end into one of said heads and projecting at their opposite ends through the other head, nuts screwed over said projecting ends, tubular guides disposed about said tie-rods, a perforated follower arranged to 95 freely slide in the cylinder over said tubular guides, coiled springs disposed about said tubular guides between the follower and one of the heads, a hooked rod freely passing through the said head and attached at its inner end 100 to the follower, a hooked rod swiveled in the other head, and a movable index actuated by the follower, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 105

SAMUEL GOODBAUDY.

Witnesses:

VINTON COOMBS,
EWELL A. DICK.