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Vaughn

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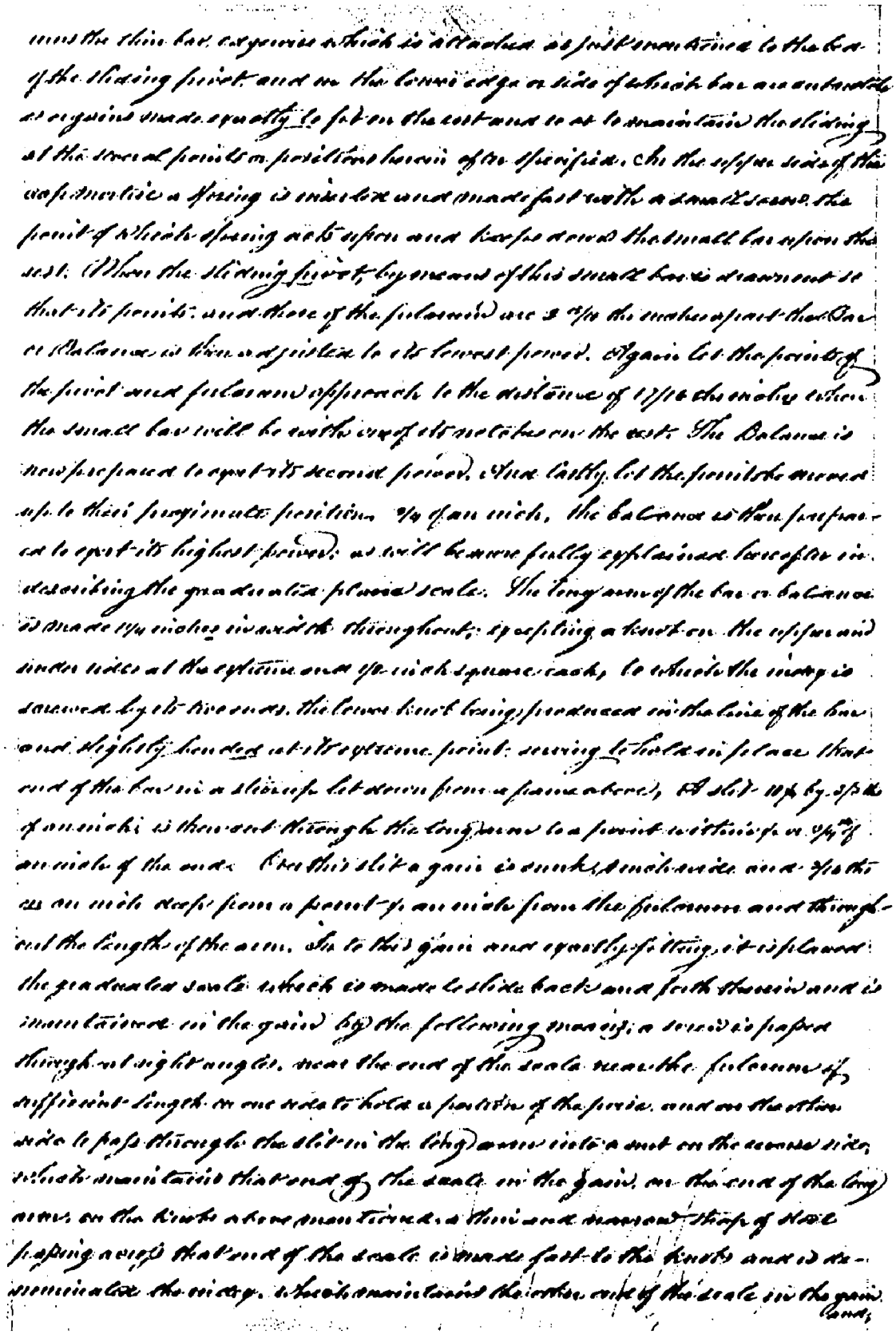
(54) **BALANCE**

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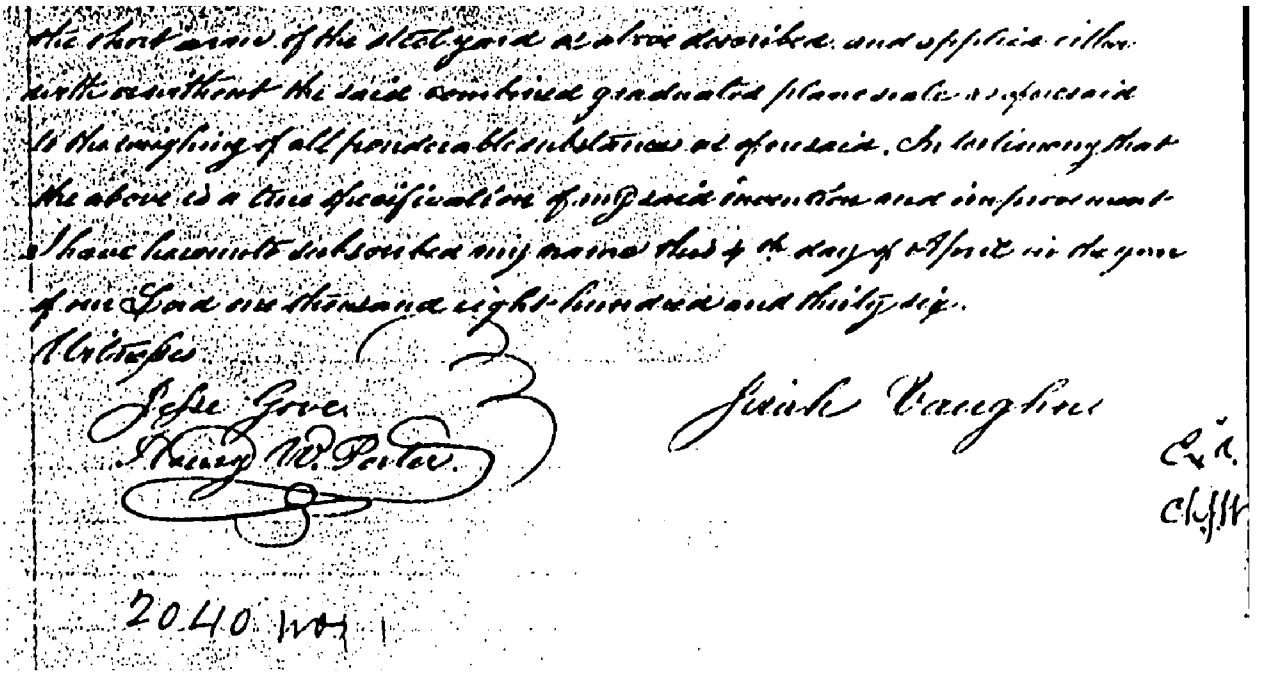
The Schedule referred to in these Letters Patent and making part of the same containing a description in the words of the said Isaiah Vaughan himself of his Improvement in the Steelyard or Roman Balance

To all to whom these presents shall come. Be it known that I Isaiah Vaughan of Pittsford in the County of Rutland and State of Vermont have invented a new and useful improvement in the steelyard or Roman Balance, and that the following is a full and exact description thereof. A Steelyard has 13 inches on the long end upon which is long setting on a sliding piece 3 of the said inch which is performed of the following words that is to say. The short arm of the bar is made 4¾ inches long and 3 inches wide being swelled at and above the fulcrum to 5 inches. The fulcrum being made and made fast at the distance of 3¾ inches from the end of the short arm before the case is put on, then commencing at the distance of 5 sixteenths of an inch from the center of the fulcrum, a slit ¾ of an inch wide is cut through the short arm to receive the sliding piece hereafter described. The sides of this slit are so filed as to receive the Square Steel a short thick bar of Steel made equally to fit in the slit and into which the sliding piece is formed. In this piece the hook is hung to which the scale or Platform is suspended containing the weight. About ¾ of an inch wide is left on with a short part to the extremities of the short arm and is made fast, with a single screw running through into each slit, which conducts into the head of the Bar. In the line of the Bar and through the cap a mortise is made ¾ of an inch long and ¼ of an inch wide, through which a thin bar or rod of the same width and thickness and about 5 inches long with a small knob on the outer end which serves as a handle is passed & so and made fast on the short arm by the Sliding piece by a pin on which it has a slight rolling motion through the cap on the lower side of the mortise, a groove in which it is moved by the sliding piece, a square piece is inserted and made fast upon the rod



and also pounds &c being drawn apart from the bar. The scale to be graduated as hereafter directed being made to fill the above mentioned space is 12¾ inches in height and weighs 11½ ounces avoirdupoise, on the end near the fulcrum a portion of the frame somewhat rectangular is attached by the screw holding the knife on the reverse side of the Bar. This portion of the frame weighs 16¾ ounces avoirdupoise. On the other end of the scale there is fixed one end of an endless screw 3 or 4 inches in length which is placed on the portion of the frame last mentioned and weighing 9¾ ounces avoirdupoise. This portion is denominated the balance frame and serves the additional office of putting the bar in balance in the following manner. The scale is then divided into three longitudinal divisions a certain number of inches which are marked the three frames of the balance. Being placed on the bar and close up to the fulcrum as near as may be the scale is then ready for graduation which is accomplished after the manner following. Suspend the bar lengthwise by the loop on the fulcrum, letting the hook on the end next to the screw be down from the frame. Draw out the sliding pivot so that the pivots and those of the fulcrum shall be 9.15 inches apart, turn the balance frame on or off the middle screw as the case may require so that the bar be in equilibrio, then draw a line across the scale close to the right hand side of the index when this first line will represent 0 on the upper horizontal division on the bar in balance. When the bar is in balance as this pivot it will be accurate in weighing any three hundred pounds. Weight suspend a pound weight on the three inch from the loop on the sliding pivot, draw out the scale from left to right until the bar is again in balance, mark across the scale as before and this second transverse line will mark the weight of 1 pound in the upper longitudinal division on the scale. Suspend as before another pound weight on the bar, draw out the scale again to a balance, mark another line across, and the mark or graduation for 2 pounds is ascertained. Proceed in like manner until the graduations are completed to the left hand end of the scale. Again move up the sliding pivot 1 inch or 1¼ inches from the pivots of the fulcrum when the small bar will attach by the notches on the ends of the

the scale at C marked on the upper division, the second middle division will show immediately under C 135 pounds. The graduation on the division will commence with three in the upper, and increase by 3 pounds at every successive transverse line to the ultimate figure of the division, each lying just with the sliding pivot between the fulcrums to the nearest position which is 3 lbs upon each between the pivots. Place the scale again at the mark C on the upper division. The middle will show directly under on the lower division 360 pounds. The graduations on this lower division also commence with three in the upper one, and increase by five pounds at every successive transverse line to the ultimate figure of the division which is 910 pounds. In the same manner are connected all other instruments of weight known in commercial or other business transactions, graduated on this scale. It is obvious that by reducing the weight of the pivots proportionally, smaller and smaller divisions of the pound may be graduated, but in that case the capacity of the balance will be relatively diminished. In like manner by increasing the pivots an increased capacity is given to the balance to any extent (in the long) and of the bar and the scale may be extended, and smaller and smaller divisions graduated without reducing the pivots. I contemplate affixing this improved balance to the weighing of locomotive bodies both upon and beneath and in combination the machine having regard and change to the ends to which the instrument like the respective and their pivots giving it size and proportion according to these ends, in order to ascertain the weight with the common scale as shown the fulcrums or in any other way and manner now used with other balances for holding the weighing things observing that when and however the balance is to be used for pivots in equilibrio at the pivots C on the upper division in order to ascertain that no smaller than accommodation on the fulcrums to distinguish the balance or get it out of true. What I claim as my improvement in the above described machine is first the combination and application of the graduated balance scale with the pivots and sliding as above described to the long arm of the steelyard and applied to the purposes of weighing and the dividing pivots in the



the short arm of the steel yard as above described, and of such size either with or without the said combined graduated plane scale as aforesaid to the weighing of all practicable kinds and descriptions of produce. In testimony that the above is a true specification of my said invention and improvement I have hereunto subscribed my name this 4th day of August in the year of our Lord one thousand eight hundred and thirty six.

Witnesses
Jesse Grove
Henry W. Porter.

Lewis Cranghton

C. H.
Cliff

20.40 WH