

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No.	1218	Press ~~Mis.~~
<i>168-69</i> Dated	<i>20-8-1820</i>	<i>N</i>

Not to be folded or roughly handled

*Proceedings of the Madras Government, Revenue Department,
10th August 1870.*

No. 168. Read the following Proceedings of the Board of Revenue, dated 9th July 1870, No. 4,770:—

Read again Proceedings of the Board, No. 8,514, of the 18th November 1869.

Read also the following letter from the General Superintendent of Public Works Workshops and Stores, to the Acting Secretary to the Board of Revenue, dated Chepauk, 24th May 1870, No. 321.

THE Board in their Proceedings, No. 1,811, of the 16th March 1870, having called for a report on the Salt Weighing Machines then in the Workshops, I have the honour to submit the following for the Board's consideration:—

2. The principle upon which these machines have been constructed being in accordance with the theory of the subject of balances, the irregular indications reported by the Collector of South Arcot* and observed by the Board when at the Workshop are fully accounted for as being the result of inferior workmanship.

3. A Weighing Machine taken at random, and having been nicely cleaned,* was tested under the most favourable circumstances, with a view to tabulate the amount of variations in weight observed by varying the position of the weight on the platform, but the result thus obtained could not be relied on, as the observed variation could be made to increase or decrease if the arm of the lever was moved up or down on the slot whilst weighing.

This "sluggishness" of the machine is caused by the friction of the knife-edges *cc*, (Fig. 2,) of the lever in their supports, the result of bad work.

4. The levers were taken from the machines and the parallelism of the knife-edges *bb*, *cc*, (Fig. 2,) tested. The red lines are supposed to be drawn from the outside ends of the knife-edges and the measurements taken are shown in the following Table. Column 2 shows the distance of *d* (Fig. 2) from the line joining *bb*, and columns 3 and 4 show the measurements taken at *b* and *b* respectively:—

Number of Machine.	Distance of <i>d</i> from line <i>bb</i> .	Distance of <i>b</i> from line <i>cc</i> .	Distance of <i>b</i> from line <i>cc</i> .	Of distance per cent.
1	39.12	2.00	2.06	+3.0
2	39.24	2.00	2.12	+6.0
3	39.12	2.03	2.00	-1.5
4	39.08	2.00	2.03	+1.5
5	39.22	1.97	2.06	+4.5
6	39.16	1.97	2.00	+1.5

*Proceedings of the Madras Government, Revenue Department,
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Supposing the intended distance of the lines of knife-edge to be two inches, and the weight to be placed first vertically over the knife-edge *b* and then over *b*, then the amount of variation in the weight as observed is shown in column 5, and for any intermediate position of the weight, the observed weight could have an intermediate value.

5. This result taken together with the "sluggishness," observed in paragraph 3, is sufficient to account for the errors that have been observed from time to time by those officers using the platform Weighing Machines.

6. The method of loading the platform of the machine by roughly putting the baskets of salt upon it is liable to put the best workmanship out of order, as the "jarr" thereby occasioned is wholly borne by the knife-edges, the parts on the keeping of which in proper order, the accuracy of the machine depends.

7. The cause of the error shown in paragraph 3 of this letter can be removed by careful construction, as also that shown in paragraph 4, though this latter is likely to occur, when in use from the "jarring" mentioned in paragraph 6, but this cause of error may also be removed by simply lifting the platform off its knife-edge supports, when loading and unloading. The additions to the machines necessary to effect this are shown in Figs. 3 and 4, and are coloured blue consisting of two rest pieces *rr*, moving vertically in the guide-straps *s*, when acted on by the toe of the lever *ll* by the pressure of the foot on the foot-plate *p*. The cost of this addition will be Rupees 13. I take the liberty of suggesting the above additions to the machines now in use in preference to the construction of another form of machine, as from the Board's Proceedings marginally noted which were kindly sent for my information, I

No. 5,834, 19th September 1865.

observe the error to be but .36 per cent., the Board requiring if possible the difference to be but .12 per cent. Such accuracy in these machines will be found difficult both to attain and maintain, as the best machines in use in the stores and workshops which are kept in good order by men who understand them will not give such accurate results, and under the present method of receiving, weighing and storing salt, it would be difficult to obtain a more useful form of machine.

ENCLOSURES Nos. 1 and 2.—Diagrams,

In the above letter Mr. Grainger replies to the Board's Proceedings, requesting him to detail in writing the defects in the Salt Weighing Machines which he verbally pointed out to the Board when they personally examined the machines in store.

2. Mr. Grainger was then of opinion (and the Board agreed with him) that serious defects were inherent in the construction of the machines. He has now so far modified this opinion as to believe that the defects may to a certain extent be remedied by improvements suggested in his letter, and he recommends the adoption of these improvements because he believes it would be difficult to obtain a more useful form of machine.

*Proceedings of the Madras Government, Revenue Department,
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3. The defects pointed out may be described briefly as "sluggishness" caused by excessive friction of the knife-rests, "the result of bad work," and inaccuracy of construction as described in paragraph 4. Both causes of error are aggravated of course by the rough method of loading generally adopted which causes a "jarr" and so disturbs the delicate action of the machines; but this may be obviated by the addition of the lever described in paragraph 7 to lift the platform off the knife-edges when loading and unloading, and the Board are decidedly of opinion that this improvement should be introduced at once into all the machines in use.

4. Mr. Grainger estimates its cost at 13 Rupees per each machine, or 3,172, (244 machines at Rupees 13,) for the whole Presidency.

5. It does not appear from this letter whether the other defects pointed out are capable of amendment so far as the machines in use are concerned, but as to this, Mr. Grainger is requested to report again, and if they are, will be good enough to state the probable cost per machine.

6. It is evident that the machines will always require the most unremitting care and attention to keep them in good order, and the services of a smith who thoroughly understands them, and can be made responsible for their being kept in good working order, are absolutely necessary in every maritime district.

7. Government will, therefore, be requested to sanction the employment of two additional smiths for South Arcot and Tinnevely, the Collectors of which

* (Mr. Reade has now in the letter above recorded, applied for a smith for his district.) districts reported that smiths were not required* (Vide Government Order, No. 106, of the 15th January 1869,) and

also the above-mentioned expenditure of Rupees 3,172 required to improve the machines in the manner suggested by Mr. Grainger.

8. The Board learn that the proposed lever can be prepared in Madras and fitted on up-country; so that it will not be necessary to send for the old machines at present. It is desirable that those now in store should first be improved as suggested, and on receipt of the orders of Government sanctioning the expenditure, further instructions will be given to Mr. Grainger.

* 9. The extra expenditure can be met partly from the budget-provision (of Rupees 2,500) for the purchase and repair of Salt Weighing Machines and the remainder from general savings under "Salt."

10. Mr. Grainger is further requested to frame a few simple instructions for the use of the machines as altered.

No. 169. ORDER THEREON, 10th August 1870, No. 1,218.

Separate Revenue, No. 12.

Salt.

UNDER the circumstances stated by the Board, the Government sanction the expenditure of Rupees 3,172 on the improvement of the Salt Weighing Machines, and also the employment of two Smiths in South Arcot and Tinnevely

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on the salary of Rupees 30 per mensem each, subject to the confirmation of the Government of India to whom this charge will be reported in the monthly statement.

(True Extract.)

(Signed) H. E. STOKES,

Under-Secretary to Government.

To the Board of Revenue.
,, the Accountant-General.

Exd. F. R. Bantleman.

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to the confirmation of
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ly statement.

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6 Sect General

G. H. Ball