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TAMIL NADU ARCHIVES

GOVERNMENT OF TAMIL NADU

Revenue DEPARTMENT

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GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

25th January 1878, No. 73 I.

Irrigation.
Account.

Read the following paper:—

No. 77. Endorsement of the Chief Engineer for Irrigation, dated Camp, Godavery, Western Delta, 8th January 1878, No. 8 I.

From Major J. BEATTY, R.E., Officiating Superintending Engineer, Godavery District, to the Chief Engineer for Irrigation, dated Camp, Dowlaishweram, 26th September 1877, No. 2,111.

I HAVE the honor to forward herewith Lieutenant Rawson's report on Mr. Larminie's pattern of screw gearing for under sluices, as tried at Vijaishweram.

One Report No. 412 of 17th September 1877, by Lieutenant Rawson, R.E.

2. The alterations that have been made in this gearing since Mr. Larminie left the district are as follow:—

I.—The recesses in the grooves have been filled in with teakwood, and the masonry at the ends of the upper grooves, against which the upper shutter was found to jam, has been faced with flat iron. This was partly intended to check leakage and partly to prevent jamming.

II.—Bars, each carrying a couple of hooks, have been fixed upon the beams that form the tramway, on which the traveller moves. The hooks were wanted for suspending the shutters when lifted, as the original arrangement was found to be defective.

III.—Chains and pins have been provided to secure the traveller in position when working.

IV.—A guide plate has been fixed on two angle irons, which are fastened to the lower frame of the traveller. This is found of much assistance in steadying and guiding the descending screw spear to find the short spear head when it is covered with water. Before this guide plate was thought of the screw spear wobbled about a good deal.

V.—Instead of a spanner, the gearing is now worked by capstan head and handspikes; the same as in Captain Brockman's gearing.

VI.—The lascars work the gearing from a rough temporary wooden platform, formed of planks tied to the framework of the traveller. Without this platform the lascars had to work in a very disadvantageous position, and the use of the platform has much shortened the time of working.

3. The gearing is now in as efficient a state as it can be put until next working season, when the grooves will be improved all the way up, and a petty alteration made to the tangent screw by which the gearing is shifted horizontally from one shutter to the other. The head of this screw requires lengthening for greater convenience of working now that a platform has been put on the traveller.

4. I shall now proceed to describe the working of this gearing.

At starting the screw spear is observed to be suspended by its middle, and the bottom of the hollow boss is about 8 feet clear of the top of the short spear head

attached to the lower shutter. This is the position in which it would ordinarily be left after working—

- | | | |
|--|------|-----------|
| (1.)—The first operation is that of lowering the screw spear and fastening the hollow boss to the short spear head attached to the lower shutter | Time | 5 minutes |
| (2.)—The lower shutter is lifted (12½ feet) and hooked on to the cross bars above described | " | 21 " |
| (3.)—The screw spear is detached from the short spear head of the lower shutter, the apparatus is shifted horizontally on the traveller, and the screw spear lowered (about 7½ feet) on to the short spear head of the upper shutter | " | 8 " |
| (4.)—The upper shutter is next lifted (about 7½ feet) and hooked on to the cross bars | " | 18 " |
| (5.)—The last operation is that of unfastening the screw spear from the upper shutter, and raising the hollow boss to such a level that the traveller may be pushed across the pier and placed in position over another vent, in readiness for opening it. The time required for this is | " | 1½ " |

5. The total time of opening is therefore 53½ minutes; or if we assume that the men were then specially exerting themselves, say 58 minutes. When Lieutenant Rawson tried the gearing the difference of level above and below the under sluices was 9 feet.

6. The first operation in closing is to lower the screw spear on to the short spear head of the upper shutter

- | | | |
|---|------|------------|
| (1.)—Unhooking the upper shutter and screwing it down | Time | 1½ minutes |
| (2.)—Unhooking the upper shutter and screwing it down | " | " " |
| (3.)—Detaching the screw spear from the short spear head of the upper shutter, lifting it, so as to bring its hollow boss to the level of the short spear head of the lower shutter, shifting the apparatus horizontally and fastening the screw spear to the lower shutter | " | 7 " |
| (4.)—Unhooking the lower shutter and lowering it, thereby closing the lower portion of the vent | " | 14 " |
| (5.)—Unfastening the screw spear from the lower shutter and raising it into the position it occupied at starting | " | 7 " |

7. The total time of closing was therefore 38½ minutes, or allowing that the lascars specially exerted themselves, say 45 minutes.

8. These times of opening and closing a vent compare somewhat unfavorably with those* reported of Captain Brockman's pattern of under sluice gearing in my letter No. 1,610 of 18th August 1877; but, since writing that letter, further trials of Captain Brockman's gearing have shown a serious defect, while there is no probability of anything of the kind occurring in regard to Mr. Larminie's.

9. You will remember that an important feature of Captain Brockman's latest designs was his method of lowering the upper shutter by means of "dogs." These dogs have failed utterly; both at the centre bay of the Dowlaisweram head sluices and at the under sluices. So far as can now be determined they never have been of any use. The upper shutter, resting on the "fids," in all cases has, it is believed, been lowered simply by its own weight; and whenever the pressure of water combined, possibly with some obstruction in the grooves, is sufficient to overcome the downward pressure due to its own weight, the dogs slip off, and become a nuisance, for there is the danger that they may get under the upper shutter and prevent it closing. The

dogs of Dowlaisweram under sluice gearing (once slipped off the top of the upper shutter, and before the fact was discovered the shutters being entirely submerged) the dogs had fallen into position under the upper shutter. From this objectionable position it was found most difficult to release them. When the upper shutters of Captain Brockman's under sluice gearing, and those of the centre bay of the head sluices, fail to lower themselves by their own weight, they have now to be pushed.

10. It may be possible to devise some means of making the "dogs" in Captain Brockman's pattern of gearing act properly, and if not the remedy will be to have a transportable screw and screw-box for the upper shutters, and abolish the "fids" and "dogs." But until the "dogs" can be so improved, Mr. Larminie's is entitled to be considered the only efficient pattern of gearing for working, by one screw, a number of vents, each closed by two shutters.

11. As it may be convenient to you to know the time required for working the old pattern of shutters, I lately had this tested at one of the centre vents of the Dowlaisweram under sluices. The time of opening a vent 12 feet high was 45½ minutes or, making the same allowance as we did in the case of Mr. Larminie's design, say 51 minutes. The lascars then proceeded to close the vent, and after ramming at the shutters with heavy rammers for 110 minutes and getting them down 9½ feet, they became almost immovable, probably from driftwood sticking in the grooves, but for this obstruction the total time would have been 139 minutes.

12. Mr. Larminie's gearing then is a means of opening a vent of 11 feet in 58 minutes, while the old method would have occupied about 47 minutes only, but, in closing there is the great advantage that a vent can be closed with certainty in 45 minutes, while by the old method, if the shutters were driven home at all, the operation would occupy at least 128 minutes, but they often get so jammed in the grooves that it is useless continuing to hammer at them as it only damages the shutter and makes it more leaky than before.

13. And this brings me to the other advantages to be derived from fitting the vents with the new shutters, similar to those of Captain Brockman's design in V shaped grooves, that it would immensely diminish the leakage, and would be the means of a large annual saving* in repairs of the shutters, and in the construction of cross bunds above the under sluices in the dry season to stop leakage. The cross bunds above each set of under sluices cost annually about Rupees 250, or Rupees 750 for the three sets. Probably the new shutters would not completely stop the leakage, but a small ring-bund in rear would doubtless be sufficient for our purpose in carrying out repairs to the aprons.

14. As Mr. Larminie's gearing has been found to work well, with less labor than under the old system (eight men instead of twelve); to open the vent in nearly as short a time; and to close it with certainty in about one-third of the time required by the old system, while the leakage by the new pattern of shutters in V grooves would be very greatly reduced, with a considerable saving in agricultural repairs, I think the remaining fourteen vents of the Vijaishweram under sluices should as early as practicable be fitted up with the new shutters and a tramway to carry the traveller, and I propose providing for this in the budget now under preparation.

P.S.—The times of opening and closing for Captain Brockman's gearing were 47 and 39 minutes respectively, but no allowance was made on account of the lascars having probably specially exerted themselves at the time the gear was tested, and if we make this allowance the times would be 51½ and 45½ minutes as against the 58½ and 45 minutes of Mr. Larminie's gearing, and the 51 and 139 minutes of the old wooden shutters (in cut-stone grooves) with wooden stems, worked by levers and rammers.

(Initialled) J. B.

From Lieutenant C. C. RAWSON, R.E., Assistant Engineer, in charge of Eastern Delta Division, Godavery District, to the Superintending Engineer, Godavery District, dated Dowlaiswaram, 17th September, No. 412.

I HAVE the honor to submit the following report on the working of Mr. Larminie's gearing recently fitted to one vent of the Vijeshwaram under sluices. The arrangement briefly described is as follows: there are two shutters sliding in parallel grooves, the upper shutter working in the outside groove. Each shutter is provided with a short stem of iron about 9 inches long on which a coarse threaded screw is cut; above the stem a small trainway is fitted on which runs a travelling carriage carrying the stem of the shutters. This stem has a screw cut on it, and at its lower extremity contains a female screw which can be screwed on to the short stems of the shutters. The carriage contains a traversing arrangement, by which the long spear may be brought over each shutter in succession. The experiments were made on September 17th, 1877, when there was 3 feet 11 inches of water on the anicut. The platform on the travelling carriage was ready fixed, two reliefs of four men each were employed. In raising shutters the time taken was 15 minutes, as under:—

	MINUTES.
Fixing screw spear on lower shutter	5
Raising lower shutter and hooking it on to the cross beam	21
Taking screw shaft off the lower shutter and fixing it on to the upper one	8
Raising upper shutter and hooking it on to the cross beam	18
Removing screw from upper shutters and bringing it back to its original position over the lower shutter	1½
Total time	53½

In lowering the shutters the time occupied was 38 minutes:—

Bringing screw shaft over upper shutter and fastening it	1½
Unhooking upper shutter and screwing it down	9
Taking spear off upper shutter and fastening it on to the lower shutter	7
Unhooking and putting down lower shutter	14
Unfastening spear and raising it clear, ready to go on to the next vent	7
Total	38½

As the men were working faster than they would do ordinarily it would only be safe to assume that it would take 50 minutes to raise the shutters, and 45 minutes to put them down. The gearing worked satisfactorily throughout; a better platform should be provided with rails round it as a precaution against accidents.

From Major J. BEATTY, R.E., Officiating Superintending Engineer, Godavery District, to the Chief Engineer for Irrigation, dated Camp, Dowlaiswaram, 10th December 1877, No. 2,934.

WITH reference to your memorandum No. 106 GD of 11th June 1877, and paragraph 14 of my letter No. 2,111 of the 26th September 1877, I have the honor to forward herewith an estimate, amounting to Rupees 8,700, for fitting the remaining 14 vents of the Vijeshwaram under sluices with shutters in two pieces, running in V shaped grooves and lifted by Mr. Larminie's gearing in use at the vent already fitted up, and to request you will be good enough to obtain the sanction of Government to it at your earliest convenience.

SUBMITTED to Government.

The estimate of Rupees 8,700 for fitting the remaining fourteen vents of the Vijeshwaram under sluices with shutters to be worked by the traveller already provided under the sanction* given for a traveller† and shutters for one vent in G.O., No. 283 I, of the 1st September 1877, is recommended for sanction.

* Rupees 1,675.

† Mr. Larminie's pattern.

2. The reports on this gear are contained in the letter No. 2,111 of the 26th September last, from the Superintending Engineer, Godavery, and its accompaniment, and the undersigned has since seen the gear work and considers it very fairly adapted to the work to be done at these under sluices.

3. The remarks on Captain Brookman's gear as in use at the Dowlaiswaram under sluices need not be noticed here further than to observe that at a trial made a few days ago it was found that the raising of shutters by this gear was remarkably easy and satisfactory, that the upper shutters went down with the lower without any difficulty, but that the dogs which are to control the former in descending are not suitable, and it will be easy to modify them or substitute an arrangement which will be as certain in its action as is that by which the upper shutter is raised.

4. The classification of the estimate for the Vijeshwaram under sluices will be—

GODAVERY DELTA SYSTEM.

CAPITAL ORINARY.

Head Works—Godavery Anicut.

C. Works.—Improving the under sluices of the Vijeshwaram branch, Rs. amount of estimate ... 8,700

(Signed) JOHN MULLINS, Colonel, R.E., Chief Engineer for Irrigation.

To the Joint Secretary to Government, Public Works Department, Irrigation Branch.

No. 78. ORDER THEREON, 25th January 1878, No. 73 I.

THE estimate of Rupees 8,700 for improving the under sluices of the Vijeshwaram branch by providing the remaining fourteen vents with shutters to be worked by the traveller designed by Mr. Larminie is sanctioned for entry in the Budget of 1878-79.

2. This sanction has been registered a No. 335 I of 1877-78.

(True Extract.)

John Mullins

Major, R.E.,
Ag. Under Secy. to Govt., P.W.D.,
Irrigation Branch.

To the District Engineer, Godavery.

„ Collector of Godavery.
„ Chief Engineer for Irrigation.
„ Examiner of Public Works Accounts.
„ Revenue Department.

Exd. S. T. Austin.

16 Spare Copies

Revenue Department
No 53.
IRRIGATION
ACCOUNT.

Govt. of (1878) Madras
PUBLIC WORKS.

THE DISTRICT ENGINEER,
GODAVERY.

Dated January 25th.

Issued

Recd. 8 Feb 78

Encl.

G. O., 25th January 1878, No. 78 I.

JANUARY.

Nos. 77-78.

Vijeshwaram Branch, Godavery District.
Sanctions for entry in the Budget of 1878-79
of the estimate for improving the under sluices
of the —

4362
Comm. to the
Board of Revenue
9 Feb 78

11 Feb 78