Public Works (1897) Department.

G.O., No. 641-2 I

DATED 12 July 97

~~W. Office 12/7/97~~ 12/7

[Despatch Abstract.]

Kistna Anicut: Estimate of Rs. 6180 for fitting ~~left Shutters~~ experimental Shutters to the crest of the —, approved and the Govt. of India requested to accord early sanction to the estimate.

Kistna Anicut: Forwarding Copy of Pros: requesting the early sanction of the Govt. of India to the Estimate of Rs. 6180 for fitting experimental Shutters to the crest of the —.

90/x

30 copies

38/2 copies with docket at the back

P.W. 83.
1,500—20-11-96.

12 - 26.7.97

Indexed 19/7

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

IRRIGATION.

Government {1897} of Madras.

PUBLIC WORKS.

Recd. } 1897. *Enclosures*

Regd. } *Spare copies*

G.O., Nos. 641, 642 I., 12th July 1897.

JULY.

Kistna Anicut

Forwarding copy of Proceedings requesting the early sanction of the Government of India to the estimate of Rs. 6,180 for fitting experimental shutters to the crest of the —.

4/7/07, All sepy. regns. 14/11

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers:—

From Captain W. M. ELLIS, R.E., Executive Engineer, Kistna Northern Division, to the Superintending Engineer, II Circle, dated 2nd June 1897, No. 187 S.E.

With reference to your endorsement, No. 389 K.N., dated 6th May 1897, on Chief Engineer's No. II/73 K.S., dated 27th April 1897, I have the honour to re-submit herewith plans and estimate amounting to Rs. 5,020 for making experimental falling shutters for Kistna anicut, Bezwada.

Enclosures.

Report to accompany the estimate for erecting experimental falling shutters on Kistna anicut.

This estimate provides for various lengths and designs of shutter as actually being constructed, but all of them following the general type of Fouracres Tumbler shutters as erected on the Sone weir and on the Grand anicut on the Cauvery.

The estimate is submitted in accordance with Superintending Engineer's endorsement, No. 389 K.N., dated 6th May 1897, on Chief Engineer for Irrigation, No. II/73 K.S., dated 27th April 1897.

2. *Details of Shutters.*—Detailed drawings, Plan, Section and Elevation, are submitted for shutters Nos. 1 and 2 and sections only showing the general design and details of the other types of shutters adopted.

The detailed plans in combination with the table and the small scale plans showing lengths and details of individual shutters and positions of the same fixed on the anicut crest will, it is believed, clearly indicate the character and details of each shutter to be made.

The main points to be decided with regard to the shutters are—

(*a*) *Lengths to be adopted.*—Various lengths from 8 to 19 feet are being tried. The shorter the shutter the easier it is to lift, but the greater will be the leakage of water between the vertical joints. It is believed that in practice, either 12 or 16 feet shutters will be found to suit best.

(*b*) *The arrangements for facilitating the sliding of the lower part of the shutter.*—It is in this that the main differences in design occur.

In the various types of shutter being tried the following different methods are adopted:—

Type I.—Curved bottom plates sliding on flat iron ways 4" wide.

Types II and IV.—Rollers running on flat iron ways.

Type III.—The bottom angle iron resting continuously on the stone sill and sliding on this.

This last is the simplest method and is used successfully on the Sone weir, but much friction must be engendered in lifting the shutter and unless rollers rest up, it is thought that they will be found most satisfactory.

(*c*) The type of stop block whether continuous which affords a straight edge between which and the shutter a joint to minimize leakage can be formed or blocks at intervals whose sole duty will be to prevent the shutter overrunning.

(*d*) *The distance apart of the connecting rods.*—The shorter distance employed, viz., 3' 6" is found by taking the scantlings of the frames of the shutters and calculating the stresses with 2 feet of water passing over.

It is proposed to adjust the shutters so as to fall with about this head. A few shutters are made with longer distances 5 feet and 6' 6" between connecting rods as a trial.

(*e*) *Whether the pivot bolts on the shutters should be quite loose or a fitted joint.*—A loose joint is employed apparently as a precaution against rusting up both on the Sone and Grand anicuts.

The questions regarding facilities of lifting and stoppage of excessive leakage under the shutters are those of the greatest importance and the experience of this season will assist in coming to a decision on these points.

3. *Masonry.*—The masonry of the crest is throughout as shown in the sections, the granite stone being the new work.

It will be noticed that the pivot of the connecting rods is in the case of the central line of shutters fixed just in front of the crest stones, while in the other line, the pivot is fixed on the crest 9" from the edge, the length of the connecting rods being reduced accordingly.

The second method of fixing is both cheaper and easier and if the reduced length of connecting rod be found to be no objection, the latter arrangement should be adopted for the whole crest. A length of 60 feet of crest is made up of selected rough granite stone facing and concrete hearting (*vide* type section No. III) and in practice, this is found very convenient to build and is recommended for the whole length of crest of the anicut.

It affords great facilities for fixing pivot bolts and previous experience has shown that such a raising stands well if the facing stones be such as will withstand the wearing of the rush of water. With the exception of this 60 feet of crest and a length of 32 feet shown in place of Bezwada cutstone the whole of the new masonry is roughly dressed granite.

Table of Shutters actually under construction.

Type.	Serial number.	Length of shutters, feet.	Height of shutter.	Distance from centre to centre of connecting rod.	Size of upright angle, iron.	Section of connecting rods.	Length of connecting rods.	Size of top angle, iron	Size of bottom angle, iron.	On what shutter slides.	Size of pivot bolts on shutter.	Height of holes for pivot bolts.			Thickness of sheet, iron.	Size of pivot bolt fixed on crest.	
I.	1	8'	2' 10"	5' 0"	3" × 2½" × ⅜"	2" × ½"	4' 0" long.	2" × 3" × ⅜"	3" × 2½" × ⅜"	On curved plates on iron way 4" wide.	1½" brass, bushed.	11"	..	..	3/16"	1½" brass.	Set up in continuous line near the centre of the anicut (*vide* plan No. 2).
	2	14'	2' 10"	5' 0"	,,	,,		,,	,,	Do. do.	,,	11"	..	..	⅛" steel	,,	
II.	3	16'	3' 0"	6' 6"	3" × 2½" × ⅜" steel.	,,		,,	,,	On 2½" diameter roller with centres below bottom angle iron as at Grand anicut on iron way 4" wide.	⅝" steel bolt, ¾" holes.	12"	10¾"	9½"	⅛" steel.	¾" iron pin.	
I.	4	16'	2' 10"	5' 0"	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	3/16" iron.	,,	
	5	16'	2' 10"	5' 0"	,,	,,		,,	,,	On curved plates on iron way 4" wide.	,,	,,	,,	,,	,,	,,	
III.	6	19'	3' 0"	3' 6"	3" × 2" × ⅜"	1" round		2½" × 2½" × ¼" steel.	2" × 2" × ¼"	On bottom angle resting on stone as at Sone weir.	½" steel to fit close.	11½"	10⅜"	9¼"	,,	½" iron pin.	
	7	12'	3' 0"	3' 6"	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	,,	
	8	12'	3' 0"	3' 6"	,,	,,	3' 1½" long.	,,	,,	Do. do.	⅝" steel to fit holes close.	,,	,,	,,	,,	⅝" iron pin.	Set up in continuous line near Bezwada end of anicut (*vide* plan No. 1).
	9	16'	3' 0"	3' 6"	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	,,	
IV.	10	12'	3' 0"	3' 6"	,,	,,		,,	2" × 2" × ¼"	On rollers with centres above bottom angle iron as per draining attached.	½" steel, ⅝" holes.	12"	10⅞"	9¾"	,,	½" iron pin.	
	11	16'	3' 0"	3' 6"	,,	,,		,,	,,	Do. do.	⅝" steel, ¾" holes.	,,	,,	,,	,,	⅝" iron pin.	
VI.	12	16'	3' 0"	3' 6"	,,	,,	3' 1½" long.	2" × 2" × ¼"	2" × 2" × ¼"	On bottom angles resting on stone as on Sone weir.	¾" bolt, ⅞" hole	12"	10⅝"	9¼"	,,	..	
IV.	13	16'	3' 0"	3' 6"	,,	,,		,,	,,	On 3" rollers with centres above lower angle iron.	¾" bolt, ⅞" hole	12"	10⅝"	9¼"	,,	..	
	14	12'	3' 0"	3' 6"	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	..	

No. 859 K.N.

Forwarded to the Chief Engineer for Irrigation with reference to his No. II/73 K.S., dated 27th April 1897, for approval and favour of sanction of the Government of India being obtained to the plans and estimates amounting to Rs. 5,020 for making experimental falling shutters for the Kistna anicut, Bezwada.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

18th June 1897.

No. 137 I.

Note by the Chief Engineer for Irrigation.

An estimate, amounting to Rs. 5,020, for fitting experimental shutters to the crest of the Kistna anicut for a length of about 200 feet, is submitted for sanction. The shutters are of the type which it has already been decided to use, but it is found where similar shutters are in use that the designs leave something to be desired in regard to details. The experimental shutters have been fitted in anticipation of sanction so as not to lose the experience which an irrigation season will afford.

2. It is unnecessary at present to express any opinion on the merits of the different types. This will be done when the estimate for shutters for the whole length is submitted.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

3rd July 1897.

Order—No. 641 I., dated 12th July 1897.

Kistna Delta System.
Kistna Northern Division.
1. Head Works.
3. Works.
Fitting experimental shutters to the crest of the Kistna Anicut.

	RS.
I. Works	5,020
II. Establishment	1,155
III. Tools and Plant	5
Total estimate ...	6,180

The estimate submitted by the Chief Engineer for Irrigation for the work marginally noted is approved.

2. Ordered that a copy of these Proceedings, together with the plans and estimate for the work, be forwarded to the Government of India, with a request that early sanction thereto may be accorded under "49. Capital expenditure not charged to Revenue," Kistna Delta System.

[Here enter No. 642 I., dated 12th July 1897.]

(True Extract.)

(Signed) W. HUGHES,
Joint Secy. to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" other Supdg Engineers

Endorsement—No. 642 I., dated 12th July 1897.

Forwarded.

(By order.)

(Signed) W. HUGHES,
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Exd. Shaik Karim.

4/7/97. All Supdg. Engrs.

IRRIGATION.

Government {1897} of Madras.

PUBLIC WORKS.

Recd. } 1897. *Enclosures*

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4/1/07, All Depty. Regrs. 29/10/57

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Type.	Serial number.	Length of shutters, feet.	Height of shutter.	Distance from centre to centre of connecting rod.	Size of upright angle, iron.	Section of connecting rods.	Length of connecting rods.	Size of top angle, iron	Size of bottom angle, iron.	On what shutter slides.	Size of pivot bolts on shutter.	Height of holes for pivot bolts.			Thickness of sheet, iron.	Size of pivot bolt fixed on crest.	
I.	1	8′	2′ 10″	5′ 0″	3″ × 2½″ × ⅜″	2″ × ½″	4′ 0″ long.	2″ × 3″ × ⅜″	3″ × 2½″ × ⅜″	On curved plates on iron way 4″ wide.	1½″ brass, bushed.	11″	..	..	$\frac{3}{16}$″	1½″ brass.	Set up in continuous line near the centre of the anicut (*vide* plan No. 2).
	2	14′	2′ 10″	5′ 0″	,,	,,		,,	,,	Do. do.	,,	11″	..	..	⅛″ steel.	,,	
II.	3	16′	3′ 0″	6′ 6″	3″ × 2½″ × ⅜″ steel.	,,		,,	,,	On 2½″ diameter roller with centres below bottom angle iron as at Grand anicut on iron way 4″ wide.	⅝″ steel bolt, ¾″ holes.	12″	10¾″	9½″	⅛″ steel.	¾″ iron pin.	
	4	16′	2′ 10″	5′ 0″	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	$\frac{3}{16}$″ iron.	,,	
I.	5	16′	2′ 10″	5′ 0″	,,	,,		,,	,,	On curved plates on iron way 4″ wide.	,,	,,	,,	,,	,,	,,	
III.	6	19′	3′ 0″	3′ 6″	3″ × 2″ × ⅜″	1″ round		2½″ × 2½″ × ¼″ steel.	2″ × 2″ × ¼″	On bottom angle resting on stone as at Sone weir.	½″ steel to fit close.	11½″	10⅜″	9¼″	,,	½″ iron pin.	
	7	12′	3′ 0″	3′ 6″	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	,,	
	8	12′	3′ 0″	3′ 6″	,,	,,	3′ 1½″ long.	,,	,,	Do. do.	⅝″ steel to fit holes close.	,,	,,	,,	,,	⅝″ iron pin.	Set up in continuous line near Bezwada end of anicut (*vide* plan No. 1).
	9	16′	3′ 0″	3′ 6″	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	,,	
IV.	10	12′	3′ 0″	3′ 6″	,,	,,		,,	2″ × 2″ × ¼″	On rollers with centres above bottom angle iron as per draining attached.	½″ steel, ⅝″ holes.	12″	10⅞″	9¾″	,,	½″ iron pin.	
	11	16′	3′ 0″	3′ 6″	,,	,,		,,	,,	Do. do.	⅝″ steel, ¾″ holes.	,,	,,	,,	,,	⅝″ iron pin.	
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	14	12′	3′ 0″	3′ 6″	,,	,,		,,	,,	Do. do.	,,	,,	,,	,,	,,	..	

No. 859 K.N.

Forwarded to the Chief Engineer for Irrigation with reference to his No. II/73 K.S., dated 27th April 1897, for approval and favour of sanction of the Government of India being obtained to the plans and estimates amounting to Rs. 5,020 for making experimental falling shutters for the Kistna anicut, Bezwada.

(Signed) W. L. C. BADDELEY, Major, R.E.,
Superintending Engineer, II Circle.

18th June 1897.

No. 137 I.

Note by the Chief Engineer for Irrigation.

An estimate, amounting to Rs. 5,020, for fitting experimental shutters to the crest of the Kistna anicut for a length of about 200 feet, is submitted for sanction. The shutters are of the type which it has already been decided to use, but it is found where similar shutters are in use that the designs leave something to be desired in regard to details. The experimental shutters have been fitted in anticipation of sanction so as not to lose the experience which an irrigation season will afford.

2. It is unnecessary at present to express any opinion on the merits of the different types. This will be done when the estimate for shutters for the whole length is submitted.

(Signed) W. HUGHES,
Chief Engineer for Irrigation.

3rd July 1897.

Order—No. 641 I., dated 12th July 1897.

Kistna Delta System.
Kistna Northern Division.
1. Head Works.
3. Works.
Fitting experimental shutters to the crest of the Kistna Anicut.

	RS.
I. Works	5,020
II. Establishment	1,155
III. Tools and Plant	5
Total estimate ...	6,180

The estimate submitted by the Chief Engineer for Irrigation for the work marginally noted is approved.

2. Ordered that a copy of these Proceedings, together with the plans and estimate for the work, be forwarded to the Government of India, with a request that early sanction thereto may be accorded under "49. Capital expenditure not charged to Revenue," Kistna Delta System.

[Here enter No. 642 I., dated 12th July 1897.]

(True Extract.)

Under Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
„ Superintending Engineer, II Circle.
„ Examiner, Public Works Accounts.
„ All Supdg. Engrs.

Exd. Shaik Karim.

X

H.E.

PUBLIC WORKS DEPARTMENT,

IRRIGATION BRANCH.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Estimate for fitting Experimental ~~shutters to the~~ Crest of the Kistna anicut.

9 ~~[illegible]~~ UNDER date the 6 P

READ the following

From Supdg. Eng. II Circle. No. 857 K.U. d/18 June/97
No 137-I d/3-7-97

Pending Report [illegible]

Note by the Chief Eng. for Irrigation

[initials] 5/7/97
D.C.

Issue
WH
I
5.7.97

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1/7/97 All Supdg. Engrs. 29/10/97

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A.S.H

Kistna Delta System
Kistna Northern Dn.
1. Head Works
3. Works.
Fitting experimental shutters to the crest of the Kistna Anicut.

	Rs
I. Works . . .	5020
II Establishment.	1155
III Tools & Plant.	5
Total Estimate	6180

that early sanction thereto may be accorded under "49 Capital Expenditure not charged to Revt." Kistna Delta System.

No. 642 I, 12.7.97

Endorsement.

Forwarded.

A.S.H
5.7.97

Des. with plans & ests (8)

2/7
97

W.H.
3.7.97
I

S. & A 1/7/97

To
The Chief Eng. for I.
Supg. Eng. II
Ex. | P.W. + F.D.

1/7/97
All Supdg. Engrs.
29/10/97

perimental shutters have been fitted in anticipation of sanction so as not to lose the experience which an irrigation season will afford.

2. It is unnecessary at present to express any opinion on the merits of the different types. This will be done when the estimate for shutters for the whole length is submitted.

No. 641 I dt 12th July 97

Order thereon

The estimate submitted by the Chief Eng. for Irrigation for the work marginally noted is approved.

A.S.H

Kistna Delta System
Kistna Northern Dn
1. Head Works.
3. Works.
Fitting experimental Shutters to the crest of the Kistna Anicut.

	Rs
I. Works . . .	5020
II Establishment.	1155
III Tools & Plant.	5
Total Estimate	6180

2. Ordered that a copy of these Procs; together with the plans & estimate for the work, be forwarded to the Govt. of India, with a request that early sanction thereto may be accorded under "49 Capital Expenditure not charged to Revt." Kistna Delta System.

A.S.H
5.7.97

No: 642 I dt 12.7.97

Endorsement.

Forwarded.

Des with plans & Ests (8)

2/7 97

W.H.
3.7.97
I

To
The Chief Eng for I.
Supg Eng II
Ex. I. W.D.

1/7/97

All Supg. Engrs.

29/10/97

E. I. Form No 1—500—3-12-96.

Public Works (1897) Department.

CURRENT No. 6692

Order

From Chief Engineer for Irrigation

No. 137-I.

Dated 3-7-97

Received 9.7.97

Enclosures 4. Tr (6 plans)

Spare copies

SUBJECT.

Kistna Anicut — Estimate of Rs. 5020 for fitting experimental shutters to the crest of the — Submitted for sanction

BACK PAPERS.

No.	Date.

FURTHER PAPERS.

No.	Date.

9

C.E.I.
1-7-97

Public Works (1897) Department.

CURRENT No. 207 K.S.

Urgent

From

Major W. L. C. Baddeley R.E.
Supg. Engr. II Circle

No. 859 K.N

Order

Dated 18 June 1897

Received 21-6-97

Registered

Enclosures 9

Spare copies

SUBJECT.

23/6

Falling shutters for Kistna Anicut — Forwards for Sanction of the Govt. of India Est of Rs 5020 for ~~us~~ making experimental — To D.E.I.

21/6/97

BACK PAPERS.

No.	Date.

FURTHER PAPERS.

No.	Date.

9

C.E.9
1-7-97

Public Works (1897) Department.

CURRENT No. 207 K.S.

Urgent

Order

From

Major W. L. C. Baddeley R.E.
Supg. Engr. II Circle.

No. 859 K.N

Dated 18 June 1897

Received 21 — 6 — 97

Registered

Enclosures 9

Spare copies

SUBJECT.

3/6

Falling shutters for Kistna Anicut — Forwards for Sanction of the Govt. of India Est of Rs 5020 for ~~the~~ making experimental —

To D.E.I.

W.C.
21/6/97

BACK PAPERS.

No.	Date.
I73-K.S.	27.4.97
R 139 K.S.	9.4.97
I64 K.S.	10.4.97
R 121-K.S.	4.4.97

FURTHER PAPERS.

No.	Date.

Report to accompany the Estimate for erecting Experimental Falling shutters on Kistna Anicut -

This estimate provides for various lengths and designs of shutter as actually - being constructed but all of them following the general type of Fouracres Tumbler shutters as erected on the Sone Weir & on the grand Anicut on the Cauvery

The estimate is submitted in - accordance with Superintending - Engineer's endorsement No. $\frac{389 K.N}{6-5-97}$ on Chief Engineer for Irrigation No. II/73 K.S dated 27-4-97.

Details of shutters

2 Detailed drawings (Plan, Section, & Elevation) are submitted for shutters Nos. 1 & 2 and Sections only showing the general design and - details of the other types of shutters - adopted.

The detailed plans in Combination with the table and the small scale plans shewing lengths and details of individual shutters & positions of the same fixed on the Anicut Crest will, it is believed, clearly

(c) Whether the pivot bolts on the shutters should be quite loose or a fitted joint

A loose joint is employed apparently as a precaution against ~~resting~~ rusting up both on the Sone and Grand Anicuts.

The questions regarding facilities of lifting and stoppage of excessive leakage under the shutters are those of the greatest importance and the experience of this season will assist in coming to a decision on these points.

3 The masonry of the Crest is throughout as shewn in the sections the granite stone being the new work. **Masonry**

It will be noticed that the pivot of the connecting rods is in the case of the Central line of shutters fixed just in front of the Crest stones, while in the other line, the pivot is fixed on the Crest 9" Inches from the edge, the length of the connecting rods being reduced accordingly.

The second method of fixing is both cheaper and easier and if the reduced length of connecting rod be found to be no objection, the latter arrangement should be adopted for the whole Crest =

A length of 60 feet of Crest is made up of selected rough granite stone facing and concrete hearting (vide Type section No. III) and in practice, this is found very convenient to build and is recommended for the whole length of Crest of the Anicut.

It affords great facilities for fixing pivot bolts and previous experience has shown that such a raising stands well if the facing stones be such as will withstand the wearing of the rush of water.

With the exception of this 60 feet of Crest and a length of 32 feet shown on plan of Bezwada cut stone the whole of the new masonry is roughly dressed granite.

Wm.
Captain R.E.
28.5.97
Executive Engineer
Kistna Northern Division

BE
Dn 28/5/97

188

(c) Whether the pivot bolts on the shutters should be quite loose or a fitted joint

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Wm.
Captain R.E.
28.5.97
Executive Engineer
Kistna Northern Division

B18
Dn 28/5/97

Table of Shutters

Letter from Captain W. M. Ellis R.E., Exe: Engineer, Kistna Northern Dn., to the Supg Engineer, 2nd Circle, dd 2.6.97, No. 187 S.E.

1P

With reference to your endorsement No. 389 K.N. dd 6.5.97 on Chief Engineer's no II/73 K.S. dd 27.4.97, I have the honour to resubmit herewith plans and estimate as per margin amounting to Rs 5020 for making experimental falling shutters for Kistna Anicut Bezwada.

No. $\frac{859 KN}{18.6.97}$

Forwarded to the Chief Engineer for Irrigation with reference to his No. II/73 K.S. dd 27th April 1897 for approval and favour of Sanction of the Govt. of India being obtained to the plans and estimates amounting to Rs 5020 for making experimental falling shutters for the Kistna Anicut Bezwada.

W. W. Baildeley
Major R.E.
Supg Engr II Circle

M.

Encls: 9
1 D & A Estt
1 Report
1 Table of shutters
6 Blue plans

Sent separately on 5/7/97

F... ...ZEB...
...ATION.
21 ... 1897
No. 207 K.S.

[illegible]
6692/57