

THE DEVELOPMENT AND TESTING OF
A FLATFISH GRADER

A. Verbaan (1978)

INTRODUCTION

In the "Administrative Reports" 1976, 1977 and in the "Report of the Special Joint Session on Biological and Technological Aspects of Electrical Fishing" issue CM1977/B:3 (page 23) it was mentioned that a flatfish grader was under development in the Netherlands.

It is common practice on Dutch beam trawlers to empty the cod-ends on deck. Depending on the season and the fishing area the cod-ends also contain a lot of benthos, debris and sand. After shooting the beam trawls for the next haul, the crew sorts the commercial sized fish from the catch and processes them (see fig. 1-6).

These repetitive jobs, such as grading and gutting, must be done by the crew in a kneeled or stooped position on a rolling and pitching vessel, quite often leading to back troubles at a relative young age (35-40 years old).

That is one reason why the Ministry of Agriculture and Fisheries of the Netherlands stimulated the development of a catchgrader. When using a grader the crew can do grading and gutting while standing upright.

The other reason for the development was to look into the possibility to improve the survival chances of a part of the discards by the application of the grader.

The tests with the catchgrader on a commercial beam trawler were carried out in the periods November - December 1977 and March - April 1978.

THE CONSTRUCTION AND PERFORMANCE OF THE GRADER

Before emptying the cod-ends into the storage tanks these must be filled with seawater.

An elevator positioned between the storage tanks transports the catch to a conveyor at working level (see fig. 7, 8 and 9).

The transport of the catch in the tanks into the direction of the elevator is assisted by means of water jets. Each tank can be connected to the elevator by means of a sliding lid.

The stainless steel elevator is perforated to get rid of the water.

The conveyor has a dividing board which guides on one side the discards and trash to an outlet back into the sea, and on the other side the graded and gutted fish into a fishwasher (see fig. 10). Grading and gutting will mostly be done by three crewmembers.

At the rear end of the fishwasher the fish is collected in baskets (see fig. 11).

One crewmember takes care of the baskets filled with washed fish, and places an empty one under the outlet of the fishwasher. He sorts the different species in empty boxes so they can be separately stored in the fish hold.

The elevator and conveyor are each driven by a D.C. electromotor, 0,34 hp/2000 revs.

The speed of the elevator can be adjusted between 0,35 to 2,0 m/min, and the conveyor between 0,4 to 2,4 m/min.

The required amount of water for the whole installation is appr. 60-70 m³/h.

The capacity of both tanks is appr. 2,9 m³.

To remove big stones the sides of the storage tanks can be tipped up.

THE INFLUENCES ON THE WORKING CONDITIONS

The introduction of a catch grader on a commercial beam trawler must be the first step to mechanisation of processing of the catch.

Figure 1 - 6 gives some insights in the working conditions of the crew on flatfish beamtrawlers.

A main part of these repetitive jobs are in contradiction with the ergonomical insights such as preventing heavy physical labour in an unnatural position etc.

The tests with the prototype of the catch grader were carried out on a beamtrawler with a deck lay-out not entirely suitable for this machine.

It can be stated however that the catch grader improves the working conditions. This opinion was also shared by the crew. Grading and gutting of the fish can now be done while standing upright next to the conveyor at an easy working level. Especially heavy physical labour will now be reduced.

THE INFLUENCES ON THE SURVIVAL CHANCES OF THE DISCARDS

During the first testing period of the grader no research has been done on the survival chances of the discards. Nevertheless we could observe that the main part of the commercial sized flatfish was still alive when passing over the conveyor. This is most likely due to the fact that the catch is held in tanks filled with seawater instead of laying on deck.

By using this method the fish is separated from the benthos under the best possible circumstances.

In the second testing period some research has been done on the condition of the discards when coming on board and also after being held in the storage tanks for a few hours. The first results of these survival tests appear to be successful.

In the latter period the fishing operations were carried out with one normal rigged- and one electrified beam trawl. The condition of the discards from both systems have been studied too.

CONCLUSIONS

At this moment a complete list of all the influences of the flatfish grader can not yet be given.

However, from the ergonomical point of view we can say that these influences are positive.

The biological aspects of the grader will be discussed in a separate report.

The prototype of the grader is now used on a beamtrawler fishing for flatfish commercially.

The skipper of that beamtrawler also has the intention to test the installation when fishing for roundfish with a bottom trawl. Before taking the grader in production all technical-, ergonomical- and biological remarks will be discussed to come to an optimum design.

An important aspect in the application of the flatfish grader is the deck lay-out of a beamtrawler.



Figure 1



Figure 2

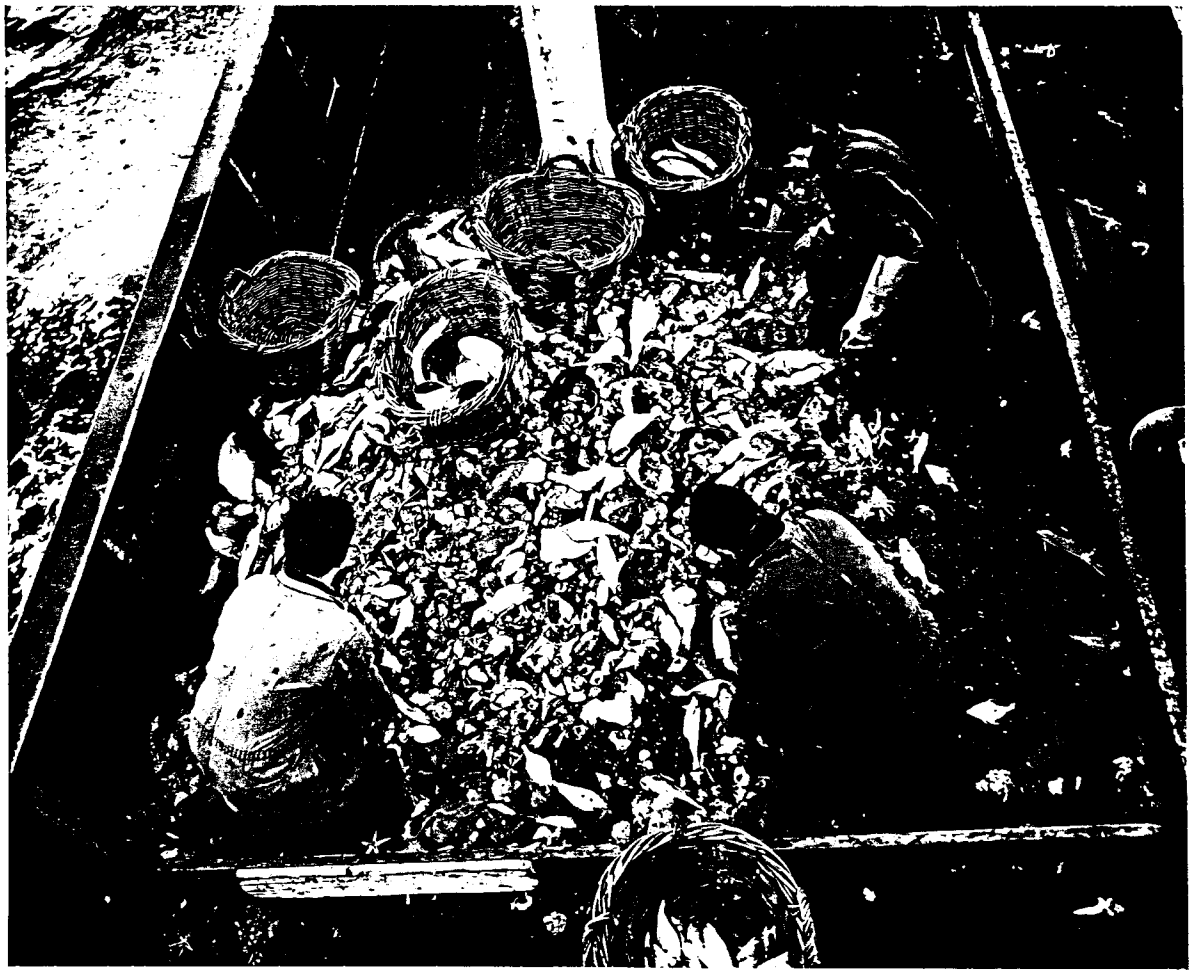


Figure 3



Figure 4



Figure 5

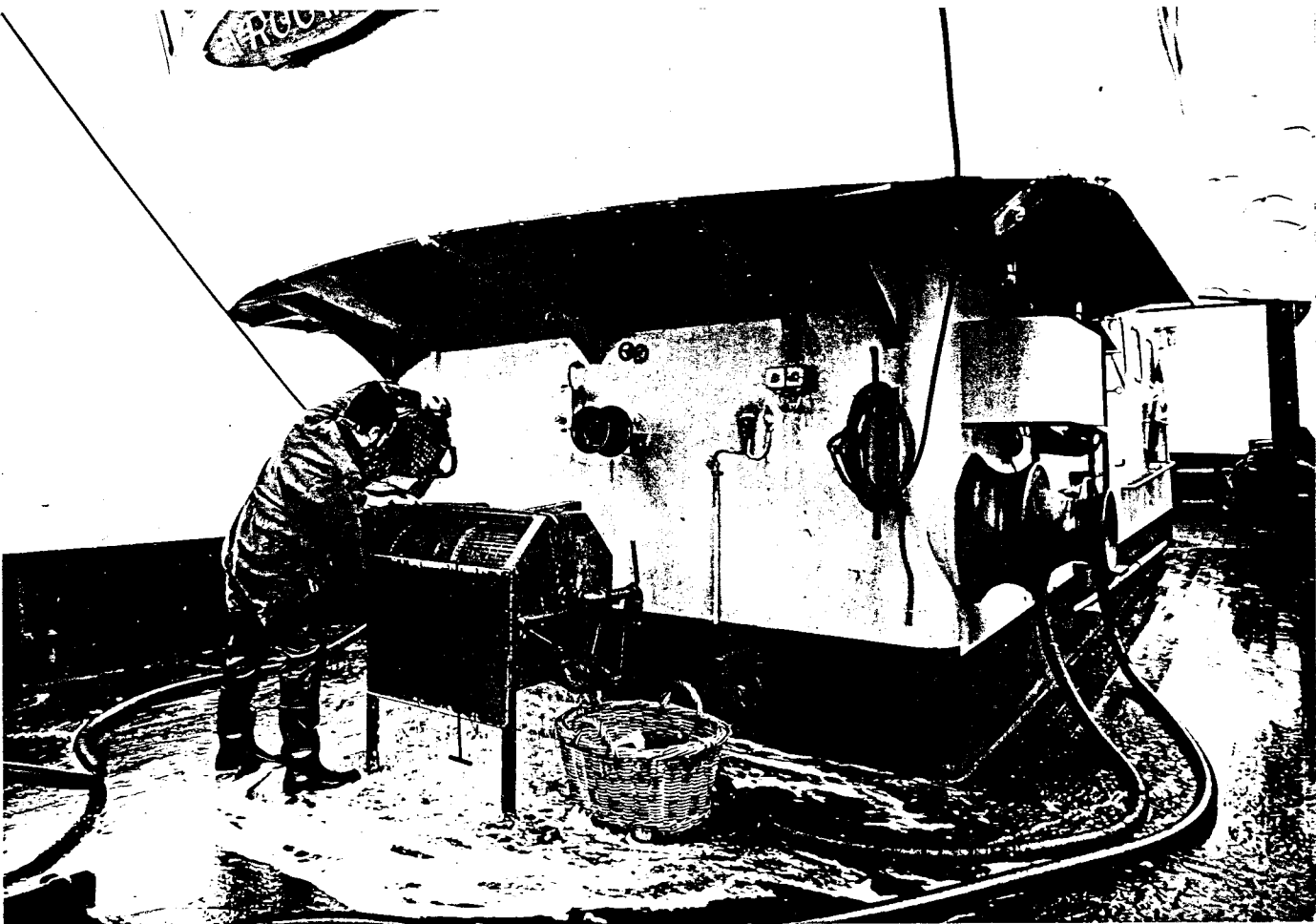
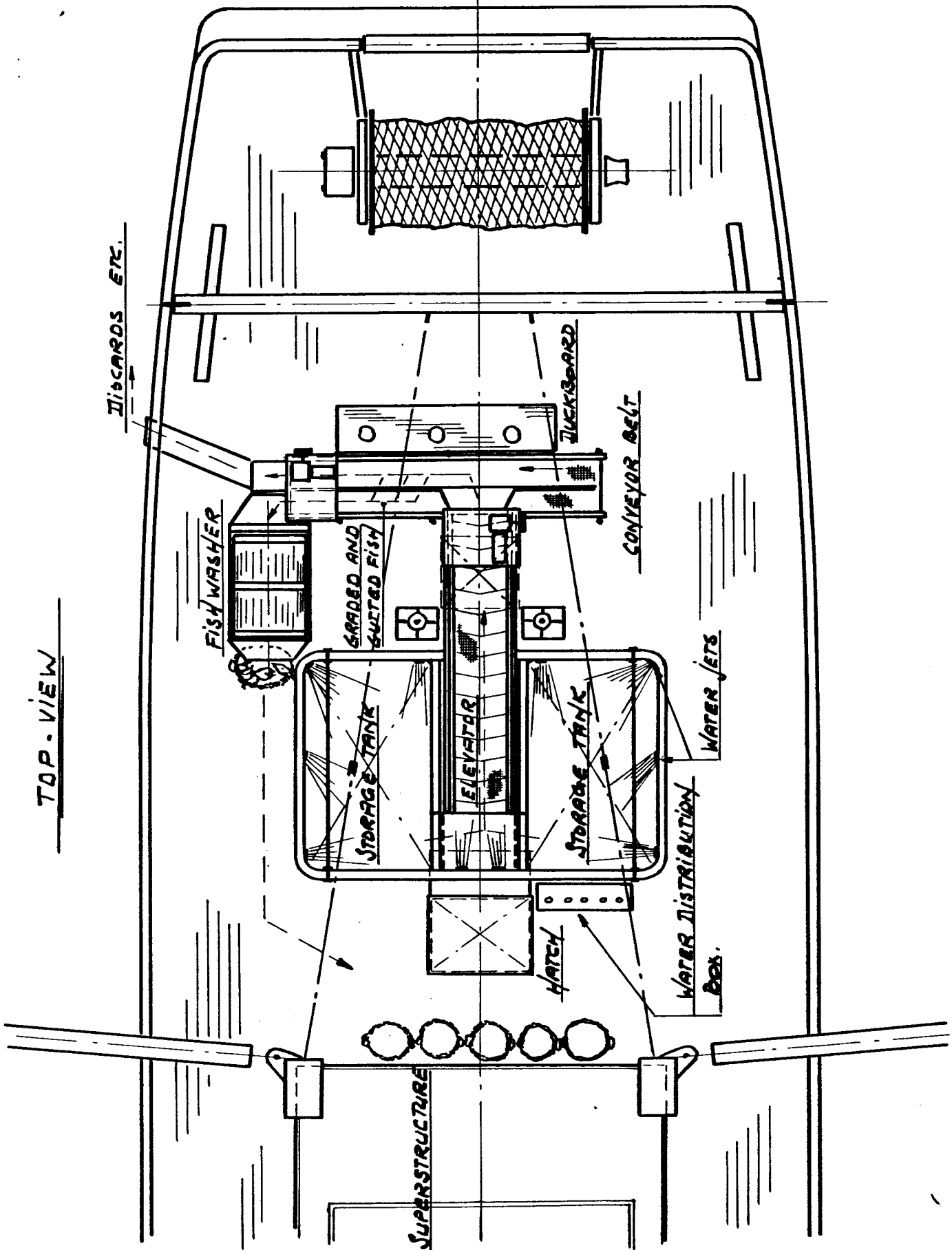


Figure 6

TOP-VIEW



Benaming

DECK LAY-OUT STERN BEAM-TRAWLER
WITH CATCH-GRADER (PROTOTYPE)

Formaat

A4

FIG. 7

RIVO - AFD. TECHN. OND.

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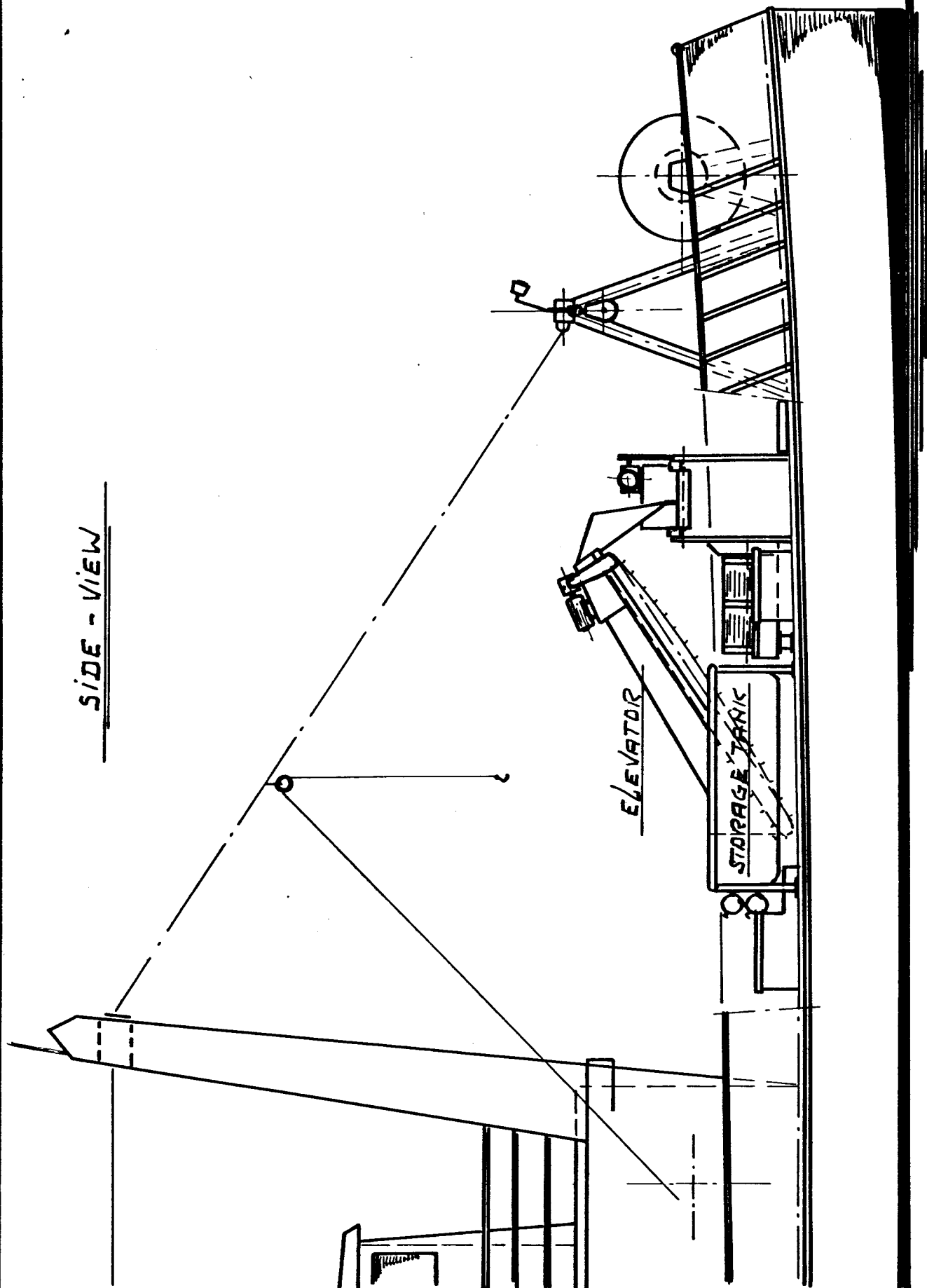
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Gecontroleerd

Getekend *J. Verbeek*

Gezien 19.4.78

Rangschikmerk



SIDE - VIEW

ELEVATOR

STORAGE TANK

Benaming DECK LAY-OUT STERN BEAM-TRAWLER WITH CATCH-GRADER (PROTOTYPE)		Formaat	FIG. 8.
RIND - AFD. TECHN. OND.	Schaal 1:50	A4	
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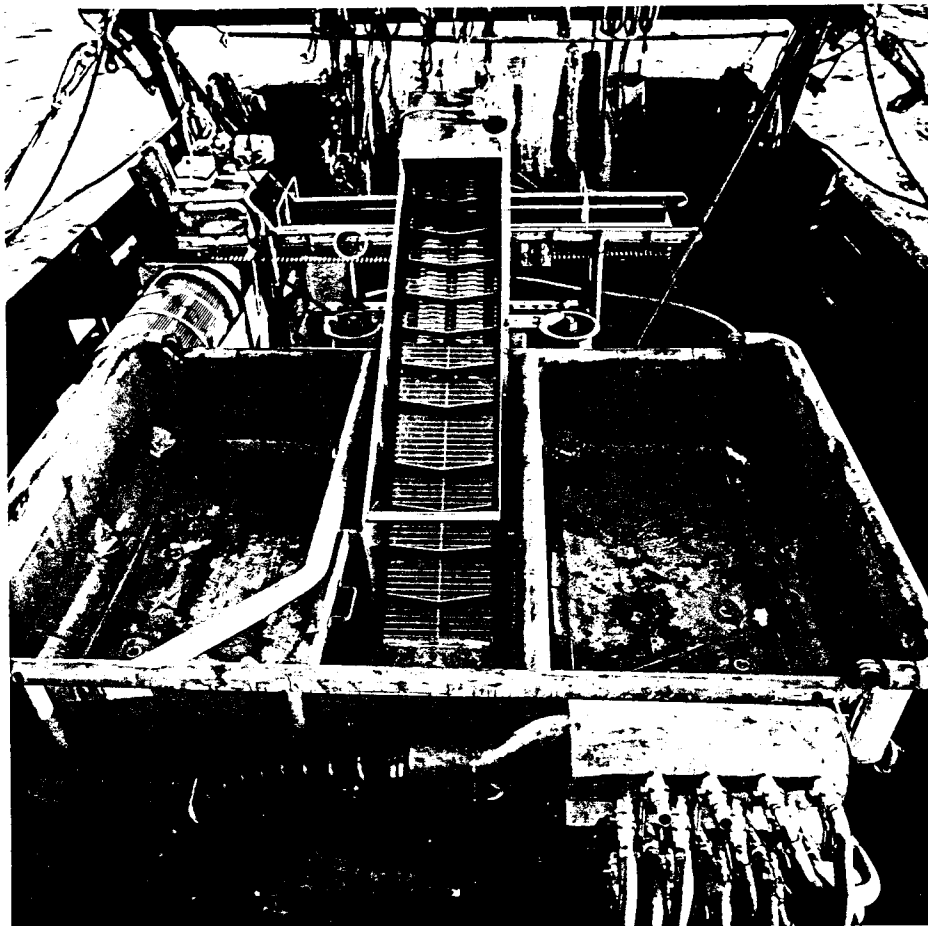


Figure 9

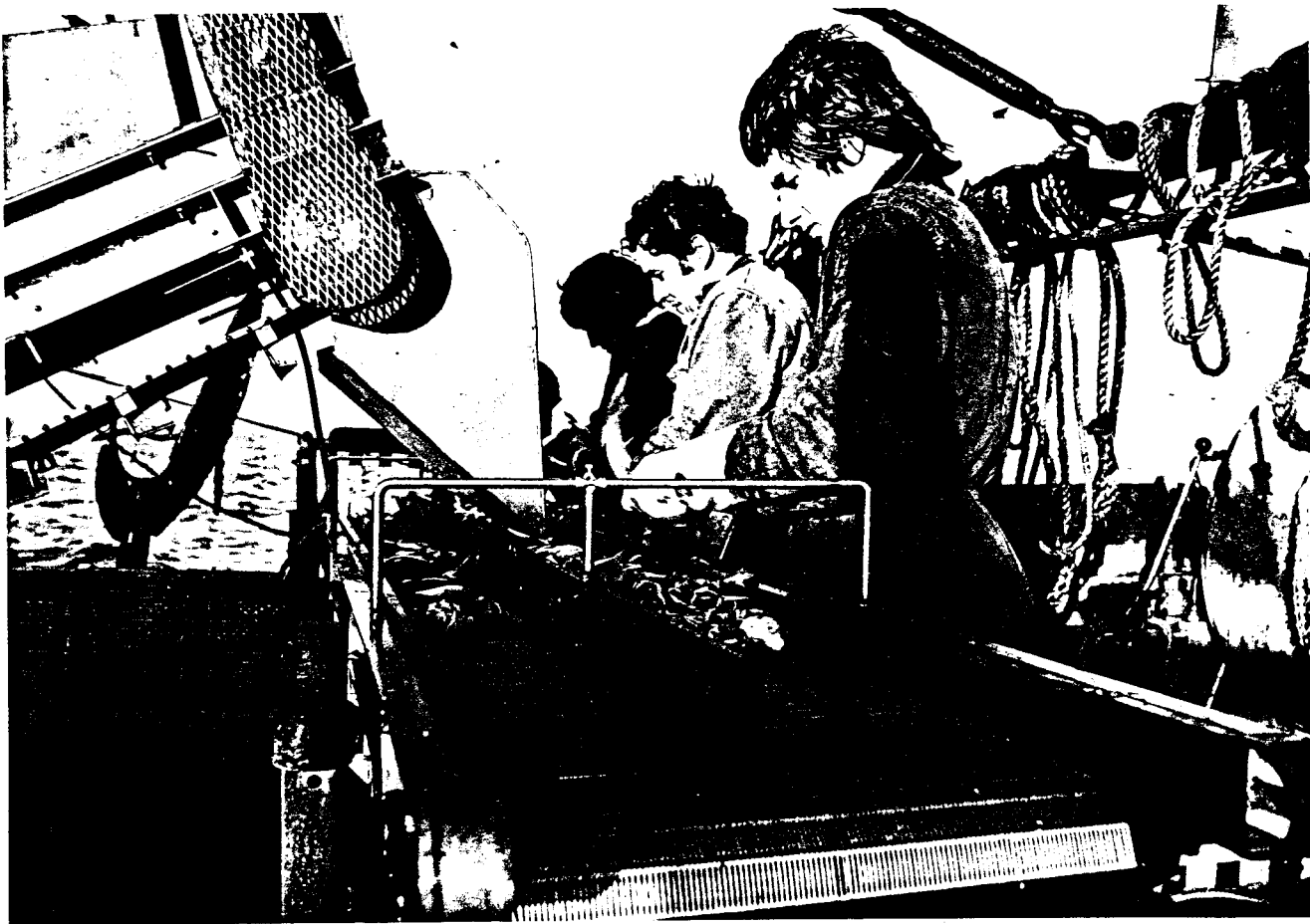


Figure 10

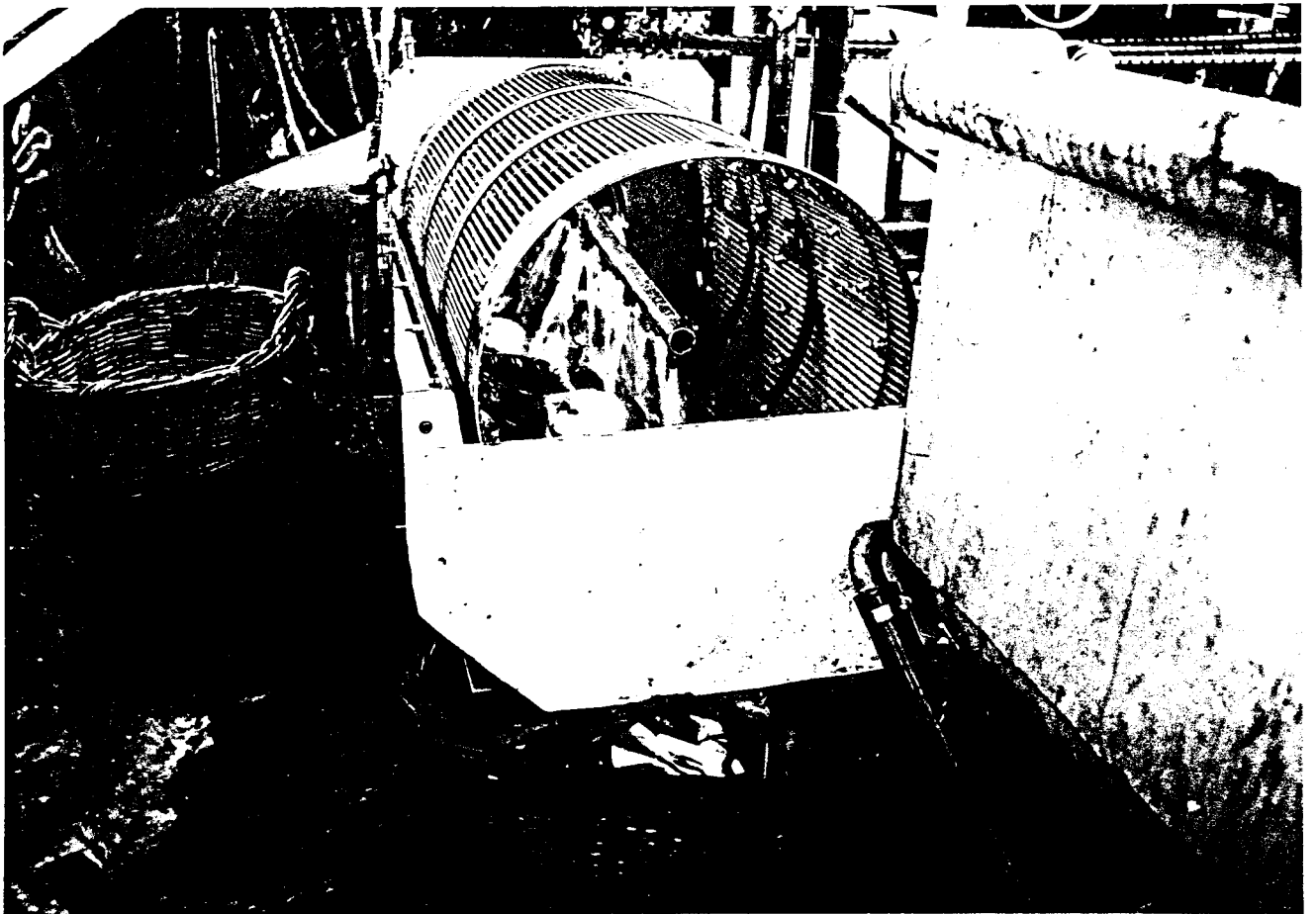


Figure 11