FACTS about FAC

No. 2

Mr Sven Wirfeldt, left, and Mr Uno Hedström, with their FAC model.

FAC AT WORK

It might perhaps be of interest to our readers to hear something about ways of using FAC. We are, therefore, going to publish in "FACTS ABOUT FAC" interviews with people who have used FAC for various purposes.

An interesting model has been built with FAC by Mr Sven Wirfeldt, Engineer, and Mr Uno Hedström, Designer, of Sandvik Steelworks, Coromant Division.

The model is quite small and is built on a single Plate. Without going more deeply into an analysis of the construction, we may say that it incorporates a system of gear trains and reciprocating slides, and a swinging platform, which perform a carefully controlled scheme of movements.

We put a few questions to Mr Wirfeldt:

- What do you use the model for?
- We were faced with the task of designing a grinding and sharpening machine for some of our special carbide tool bits, which must have a specific movement in relation to the grinding wheel.
- And you think that you have solved your problem?
- Yes, we do. The mechanical functions realised with this model are, without doubt, the solution to our problem. The design work that remains is pure routine.

- I know this is the first time you are using FAC - did you find it difficult?
- No, not in the least. - We got the kit, an X-2 case, shortly before lunch one day, and we had a first model ready before we knocked of for the day. And, a couple of days later, the construction was finished.
- Was the model necessary - couldn´t you have solved the problem on the drafting-board?
- Of course we could - but the model was a very great help because we could tinker and experiment with it. We had to simplify one of our original ideas, and there were certain problems about making some parts of the machine sufficiently stable and rigid to ensure the accuracy required. By having the complicated system of movements clearly visualized from the very beginning, we undoubtedly saved many hours of work.
- If you had not had a FAC kit, how would you have gone about it?
- We were, in fact, just planning to have a 1:5 scale model made, when someone thought of FAC. A scale model would, of course, have come much more expensive, and I may mention that the same problem as ours has been attacked in other places, and that tens of thousands of dollars´ worth of full-scale models have been built - still without hitting on the perfect solution. — Of course, FAC cannot replace the eventual machine, but it is an excellent means of saving time in design and drafting offices.

(B. Ström)

FAC FORUM

From talks with FAC users, we have found that some fundamental building principles have not always been fully grasped by everybody, and we think it advisable to devote some space to clearing up a few cases frequently encountered in FAC work.

When you build with FAC, it is important that you plan your work in such a manner that the number of mounting operations is reduced to a minimum. Some of the Couplers in the system require four screws, and this often means that all of these screws and nuts have to be taken out and installed anew when the structure is to be dismantled or modified.

For various types of machine foundations and racks, in particular, it is often necessary to shift subassemblies in order to accomodate a new part; in such cases, four-screw couplers should be avoided. Instead, other forms of construction with few screw connections should be used, and preferably of a type only requiring the screw or nut to be loosened, not removed completely, so that the respective part of the rack, or subassembly, can be easily removed or shifted to a better position. This does not mean that the construction, as such, need lose in rigidity.

The four-screw Couplers are intended mainly for heavier truss frameworks, e. g. bridges and cranes, but should generally not be used in machine framework building.

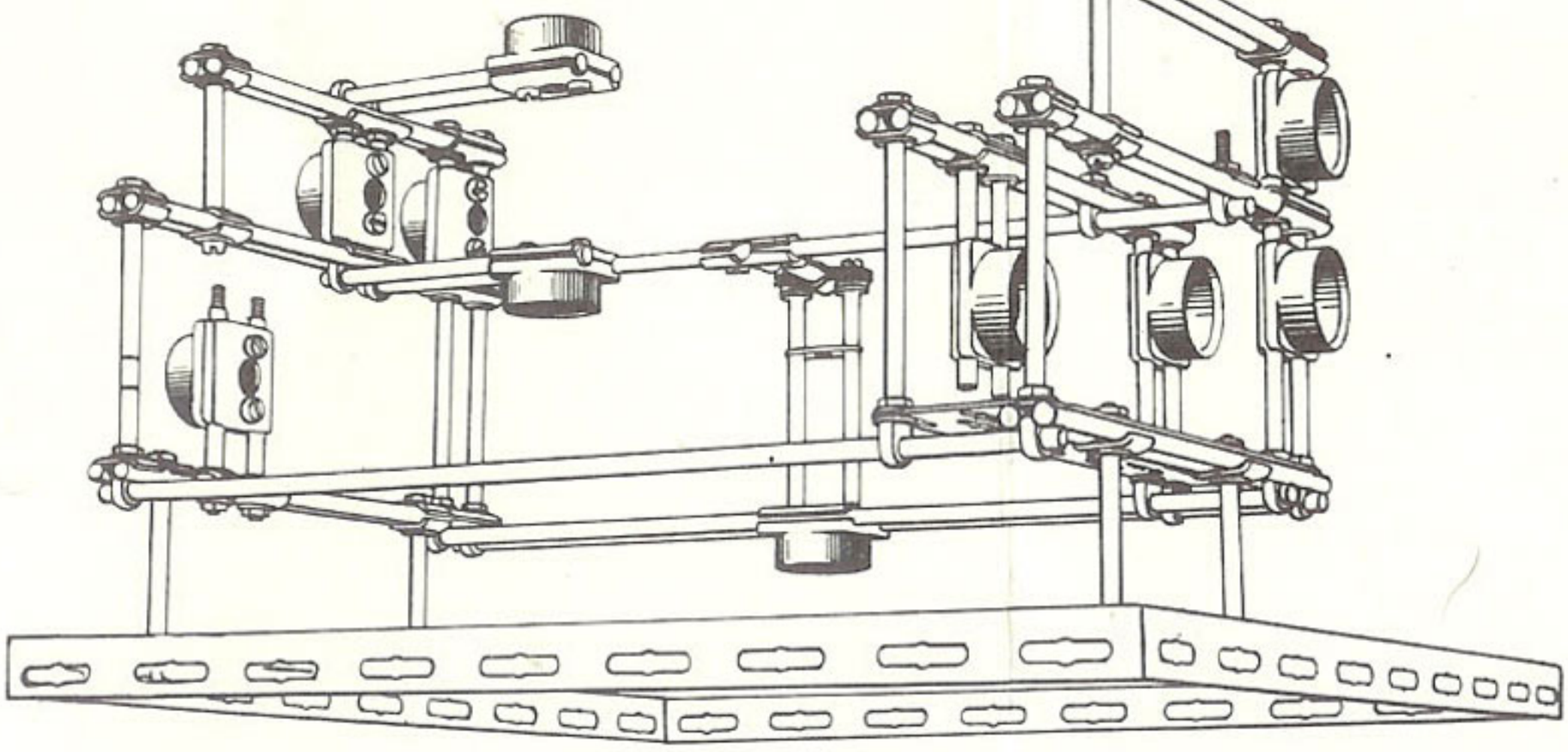

Fig. 1

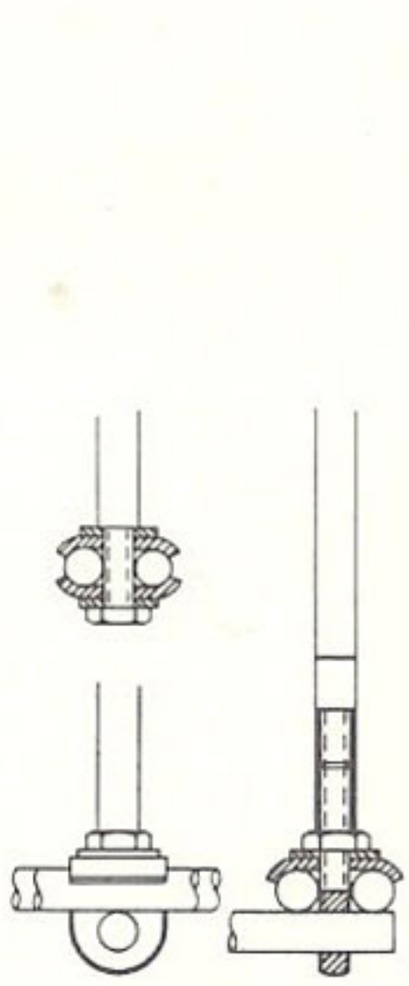

Fig. 2

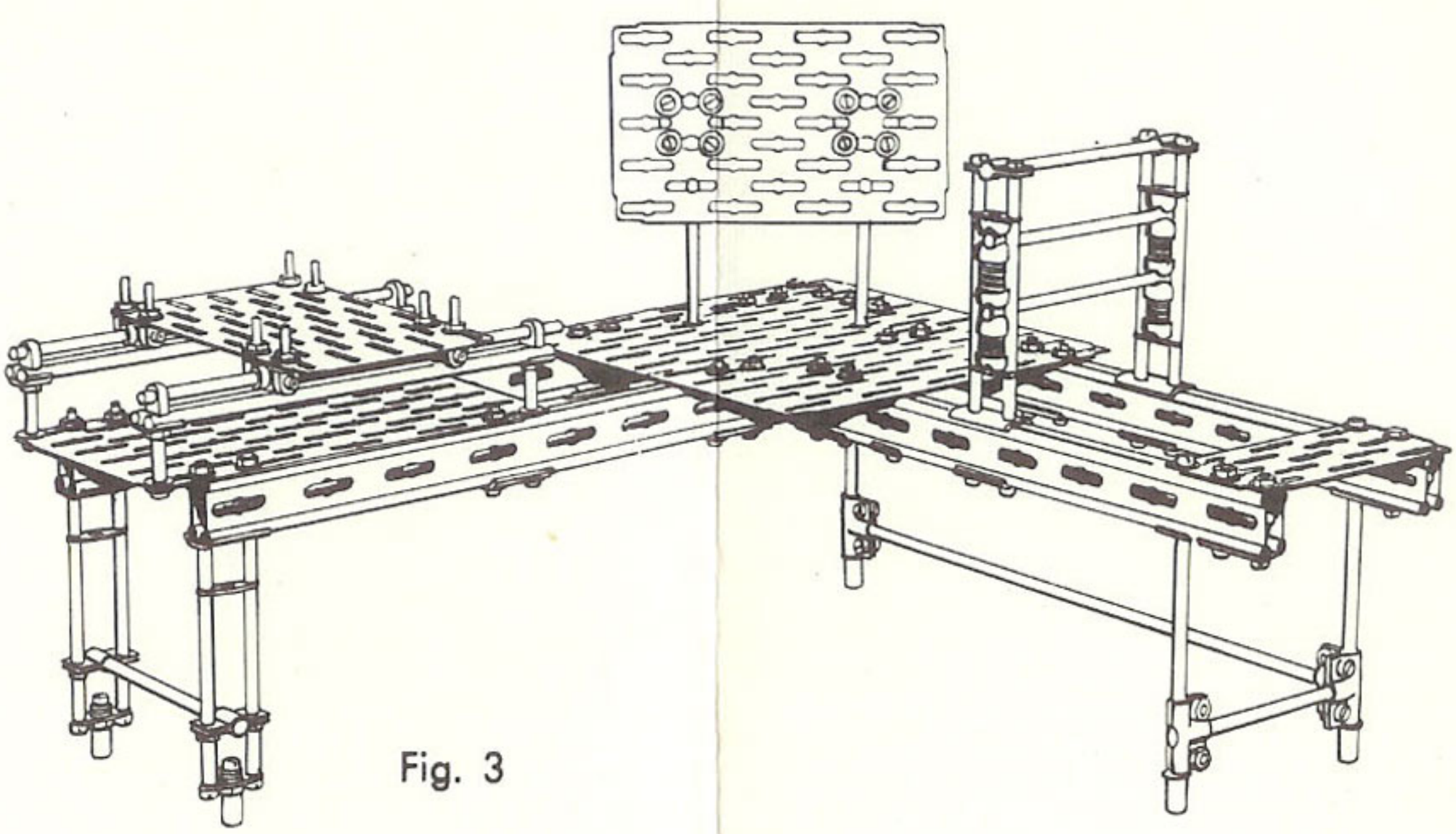

Fig. 3

A few pictures of frameworks and other structures will serve to illustrate the principle.

Fig. 1 shows a structure built of Rods and Threaded Rods on a Baseplate. The Ball Bearing Boxes mark the locations of the shafts in the construction. The centres of the shafts can be adjusted to a fraction of a millimetre by sliding the bearing boxes along the vertical and horizontal rods before pulling the screws tight. This type of structure permits ready accessibility from all sides because of its slenderness, which does not detract in any way from a good rigidity and load-carrying ability. - Fig. 2 shows two types of rod coupling which dominate the construction; both permit easy changes by loosening the nuts, and in both cases only one nut is concerned.

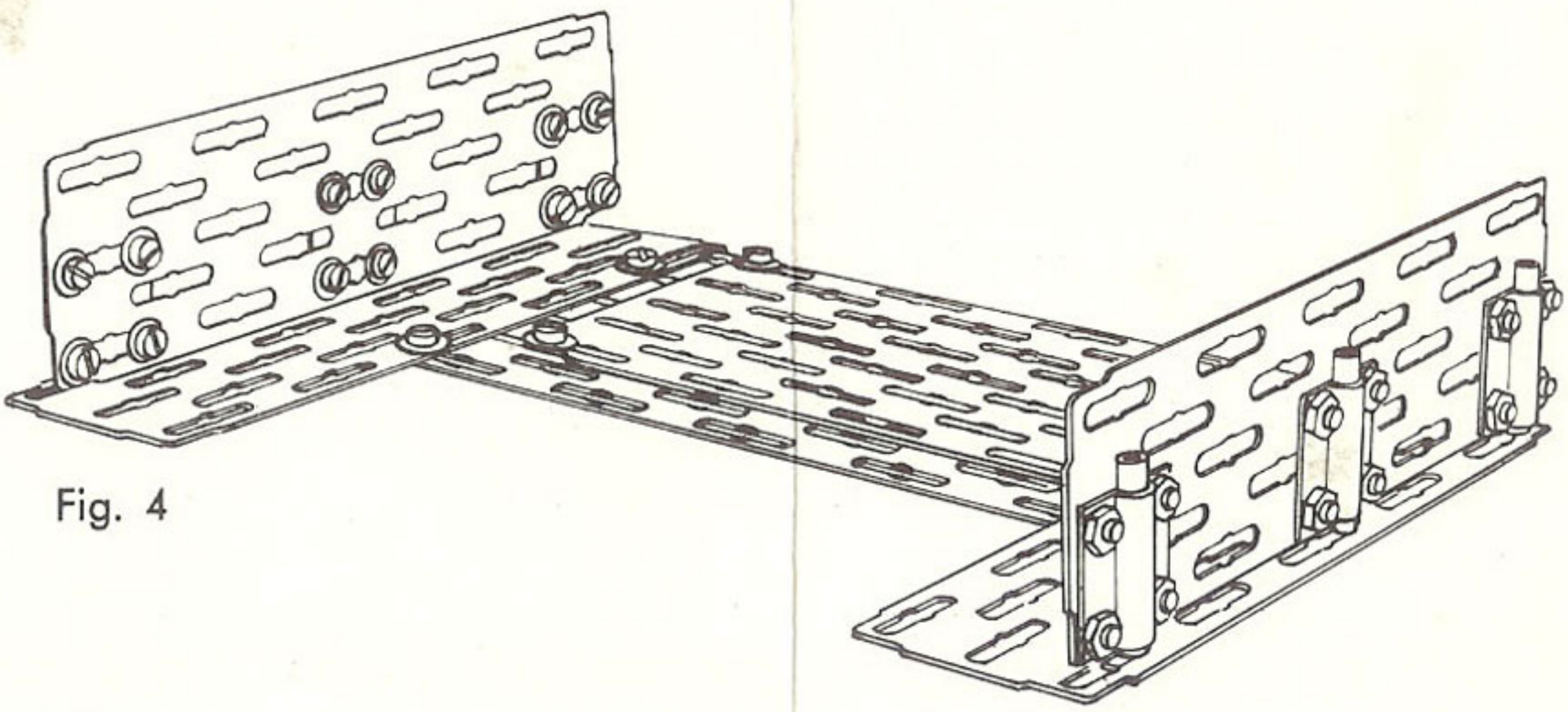

Fig. 4

Fig. 3
This framework consists of coupled Beams with attached Plates, and will support very heavy loads.

Fig. 4
Plate structure. The two end plates are attached by means of Saddle Couplers F5-01 placed around short Threaded Rods mounted in the lower plates. To remove the end plates, loosen the bottom nuts of the threaded rods - three operations - or remove all screws of the saddle couplers.

The use of Inside Angles F3-01 would have meant reduced accessibility in the corner between the plates, and it would have been necessary to remove screws and nuts - six operations. The saddle couplers and threaded rods also bring about a considerable reinforcement of the side plates.

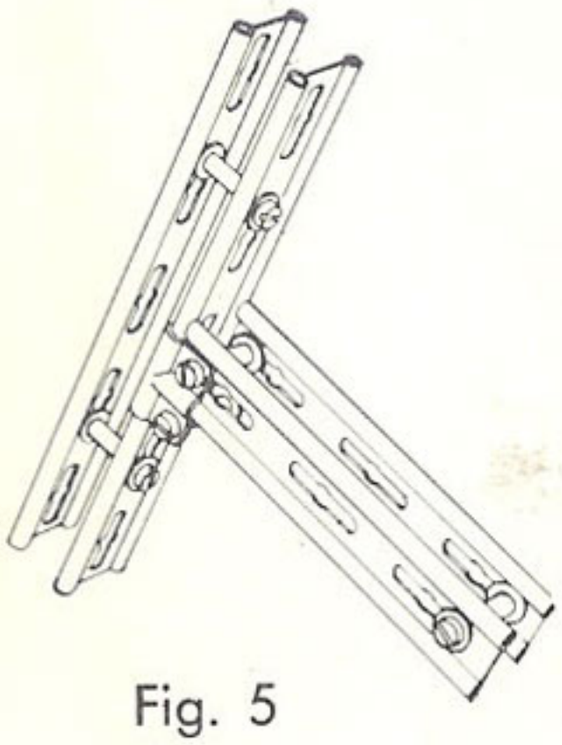

Fig. 5

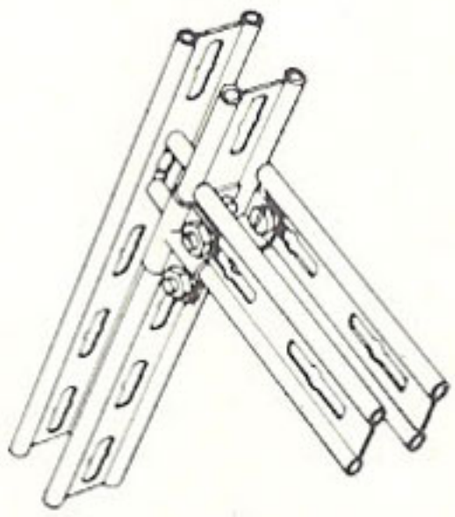

Fig. 6

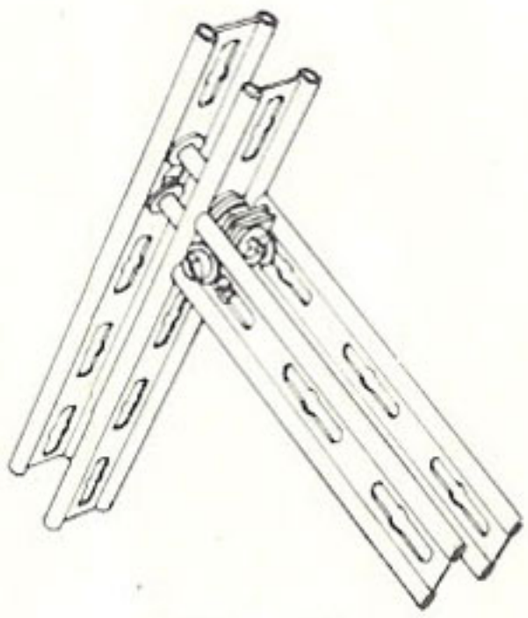

Fig. 7

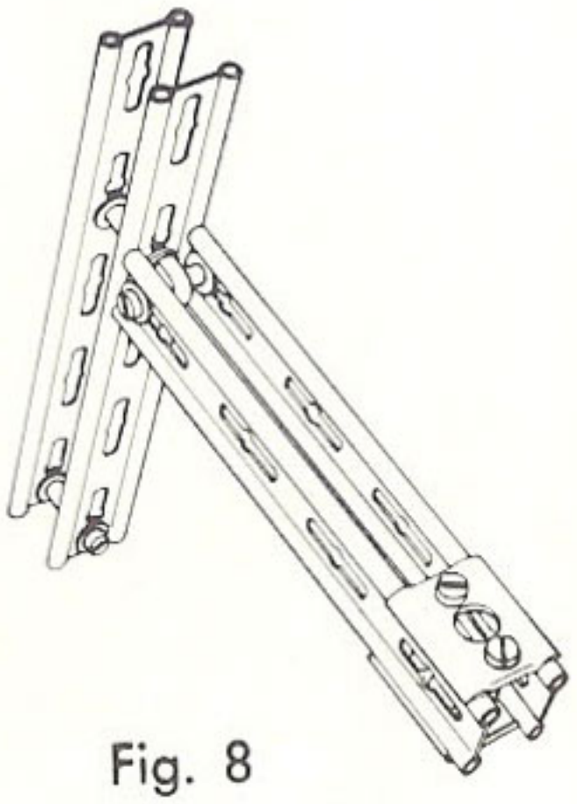

Fig. 8

Figs. 5-8 show four methods of assembling a beam tee.

Fig. 5. With this assembly method, the horizontal girder can be moved relative to the upright, and is locked in position by tightening the nuts - four operations.

Fig. 6. This type of connection is made with T-Couplers F1-02, Inside Angles F3-01, Outside Angles F3-02, and Strap Couplers F1-01. The connection is limited to the slots in the upright beams, and has six mounting operations to be carried out in narrow and inaccessible places; it should consequently be avoided.

Fig. 7. Connection with Tapped Sleeve A5-12 and Strap Couplers, also with the possibility of positioning limited to the slots in the upright. The construction is simple and very rigid, and has four operations.

Fig. 8. Connection made with Threaded Sleeve A5-12 and Eye Screw T3-12. It requires three operations for an elegant solution, but requires some form of support at the free end of the horizontal beams.

Figs. 9-17

Nine methods of strenghtening plates by means of rods or beams. The construction method of Fig. 9 makes use of the thinner gauge plates C1-, so that the clamping action is retained (see FAC Manual). Figs. 10,11,12 illustrate commonly used methods of securing plates to rods and beams (see also Figs. 1 and 2).

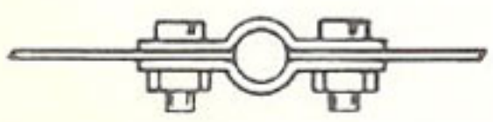

Fig. 9

Fig. 10

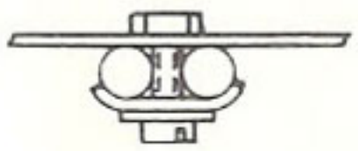

Fig. 11

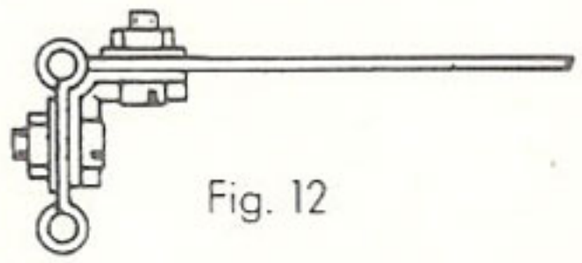

Fig. 12

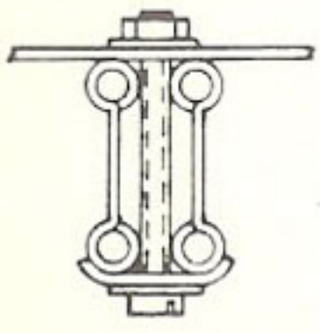

Fig. 13

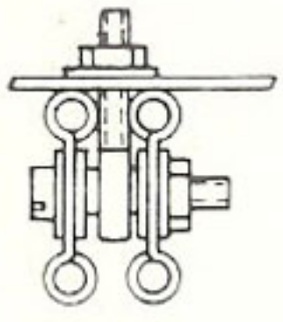

Fig. 14

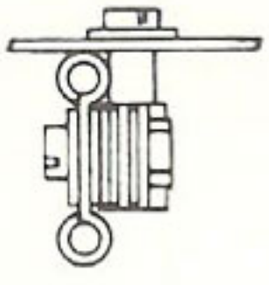

Fig. 15

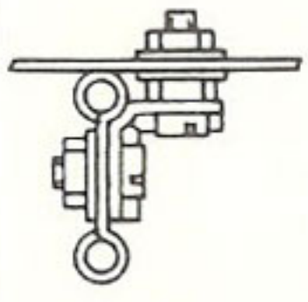

Fig. 16

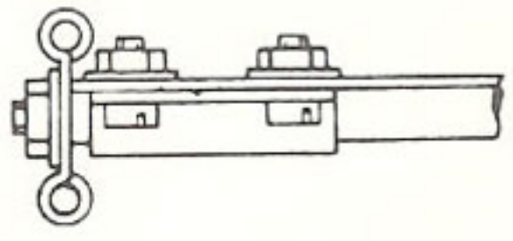

Fig. 17

BY THE WAY — did you know that FAC is now being used in 26 countries in all parts of the world.

During 1958, the network of FAC agents in these countries have introduced FAC in industries, large and small, to private consultant engineers, and in technical colleges and institutes where FAC has filled a longfelt need.

FAC

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