ISLAND OF SAINT HELENA

AN HISTORICAL DESCRIPTION OF THE LADDER

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CHARTERED SURVEYOR

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The Ladder Saint Helena

also known as:-

1. Jacobs Ladder

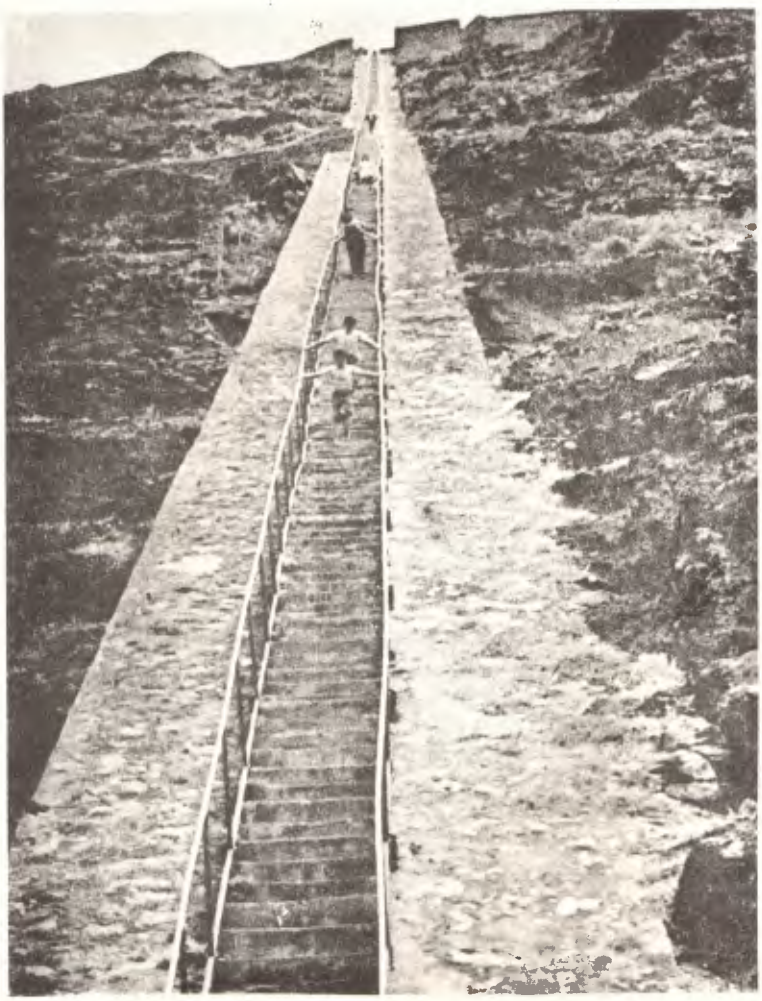
2. The inclined Plane

3. The Ladder Hill Railway

4. The Ladder Hill Tramway

It is said: "It breaks your heart going up and your neck coming down"

THE LADDER, LOOKING DOWN



THE LADDER, LOOKING UP

To

Lieutenant Colonel Frank E. Gilpin, O.B.E.,

(ex Royal Artillery)

Former Acting Governor and Commander-in-Chief,

Island of Saint Helena

Without this Ladder, his former regimental colleagues would have had

great difficulty in supplying the Ladder Hill and High Knoll Fortifications.

My acknowledgements to Professor L T Croft, Dean of the Faculty of Architecture and Allied Disciplines, University of Natal, Durban, for his assistance in enabling me to publish this work and Professor B Biermann, Professor of Architecture, for his guidance and interest.

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The original method of access to western side of the island was the old Cow Path although it would appear that a rope ladder existed on the site of the present ladder which is clearly borne out by John Thornton's map of 1704, as shown on page 8. It is uncertain as to how long this method of access to the hinterland survived.

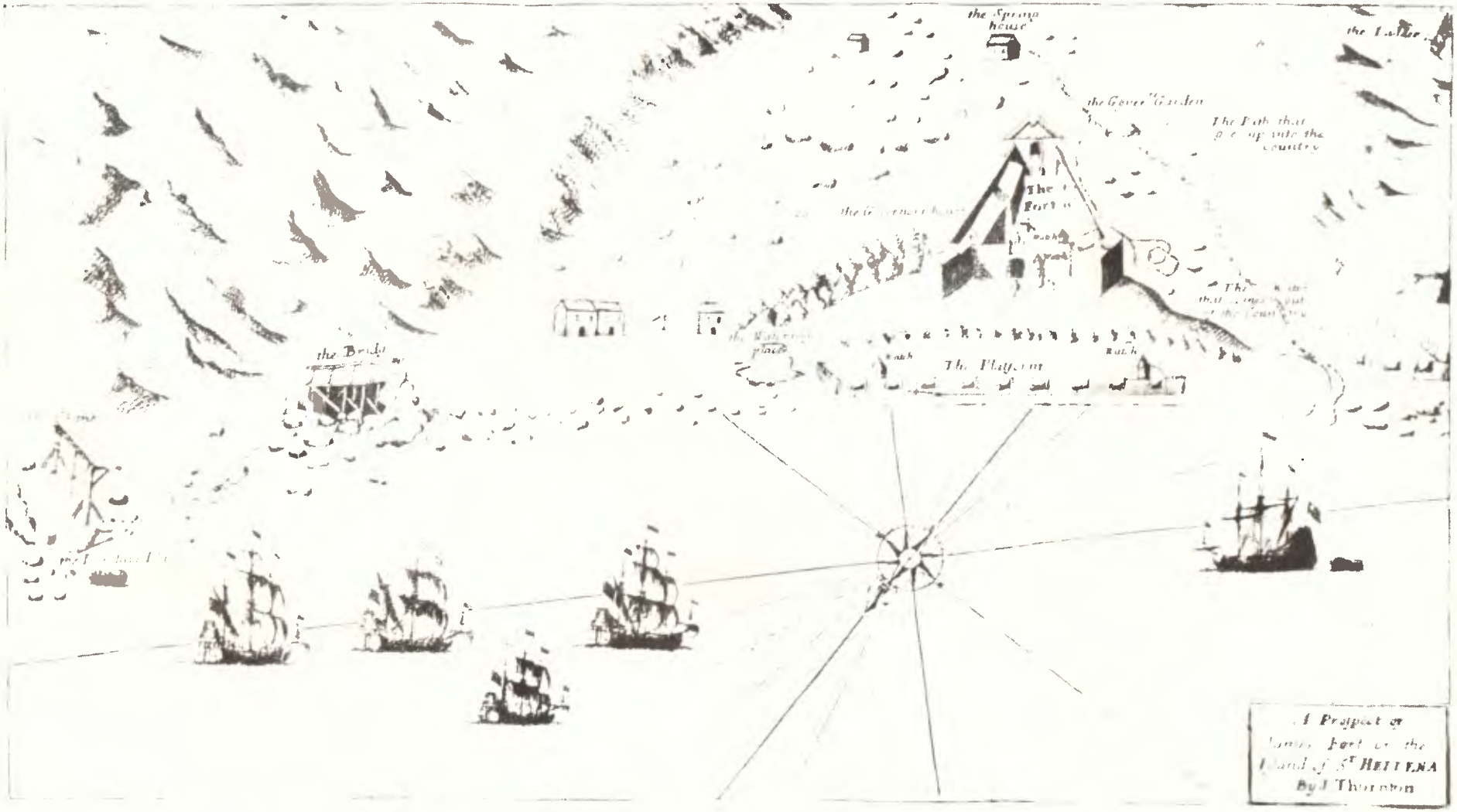
The first mention in The English East India Company Records to 'The Inclined Plane' as it was then called is a proposal for its construction in 1828, in order to save time and labour in the transport of ammunition and stores to Ladder Hill and beyond.

The records of 1829, indicate its completion in December of that year the whole of the finance for its construction being raised by local people as a private venture consisting of three hundred and fifty three shareholders being later sold to the English East India Company for the sum of £882.10.0.

It is worthy to note that the whole of it was constructed on the island (except for the chains), which was a remarkable achievement.

The original construction details were as follows and are illustrated on pages 10 and 12 showing a double rail system with one cart ascending while the other descends.

The rails were formed of fir timber, of the dimensions marked; the fir timber was plated with iron 1/8th of an inch thick. These timbers rested upon wood sleepers, placed at an average parallel distance of 10 feet. The sleepers were bolted to the solid rock, and the intervals filled up with masonry. On every second sleeper, were rollers to ease the chain up and down, of the following form:-

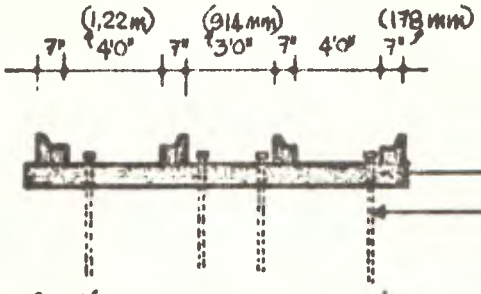

the Spring house
the Gover Garden
The Path that
country
The Fort
the Bridge
The Platform
Bath
A Prospect of
Island of St HELLENA
By I Thornton

In the centre resting between the lines was a stair for foot passengers containing seven hundred steps. The machinery for the two wagons was situated at the top of the ladder and worked by three mules with a half inch chain round a capstan of two feet diameter.

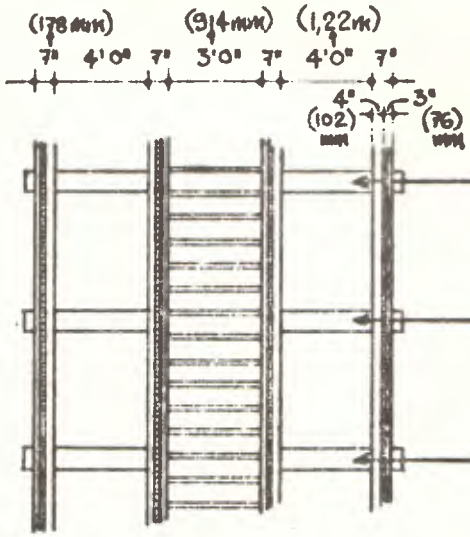
After completion in 1829, a major problem arose, that of the chain breaking on ascent as little heavy traffic descended. The maximum load never exceeded sixteen hundred weight and this caused such concern that it prompted an anonomous writer to contact "The Mechanics Magazine" in London and a letter dated Saint Helena July 3rd., 1831, appeared in the February 11th, issue of 1832.

The appeal was answered in the issue of the magazine dated March 29th, 1834 by a Mr J W Hoar and it is possible that this man was the local church organist. Mr Hoar reported:-

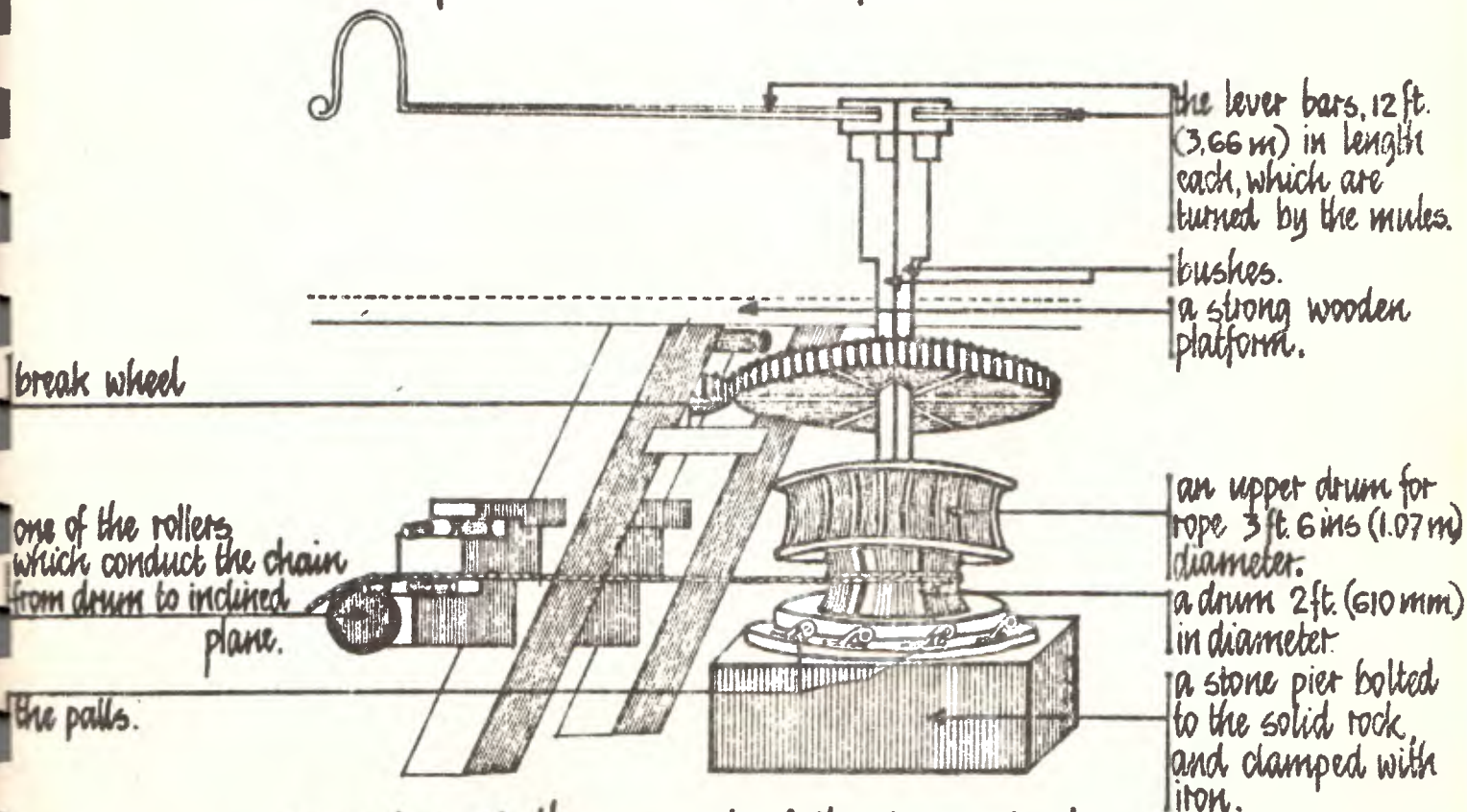
> "The original machinery was, undoubtedly, very faulty, being subject not only to excessive tear and wear, but extremely liable to accidents. The main cause of this was a sudden and two-fold bend in the line of draught at the summit of the plane, which occasioned a lateral pressure on the chain or hawser; more destructive than its own tension."



a section of the inclined plane



a plan of the inclined plane.



apparatus at the summit of the inclined plane for drawing up the carriages.

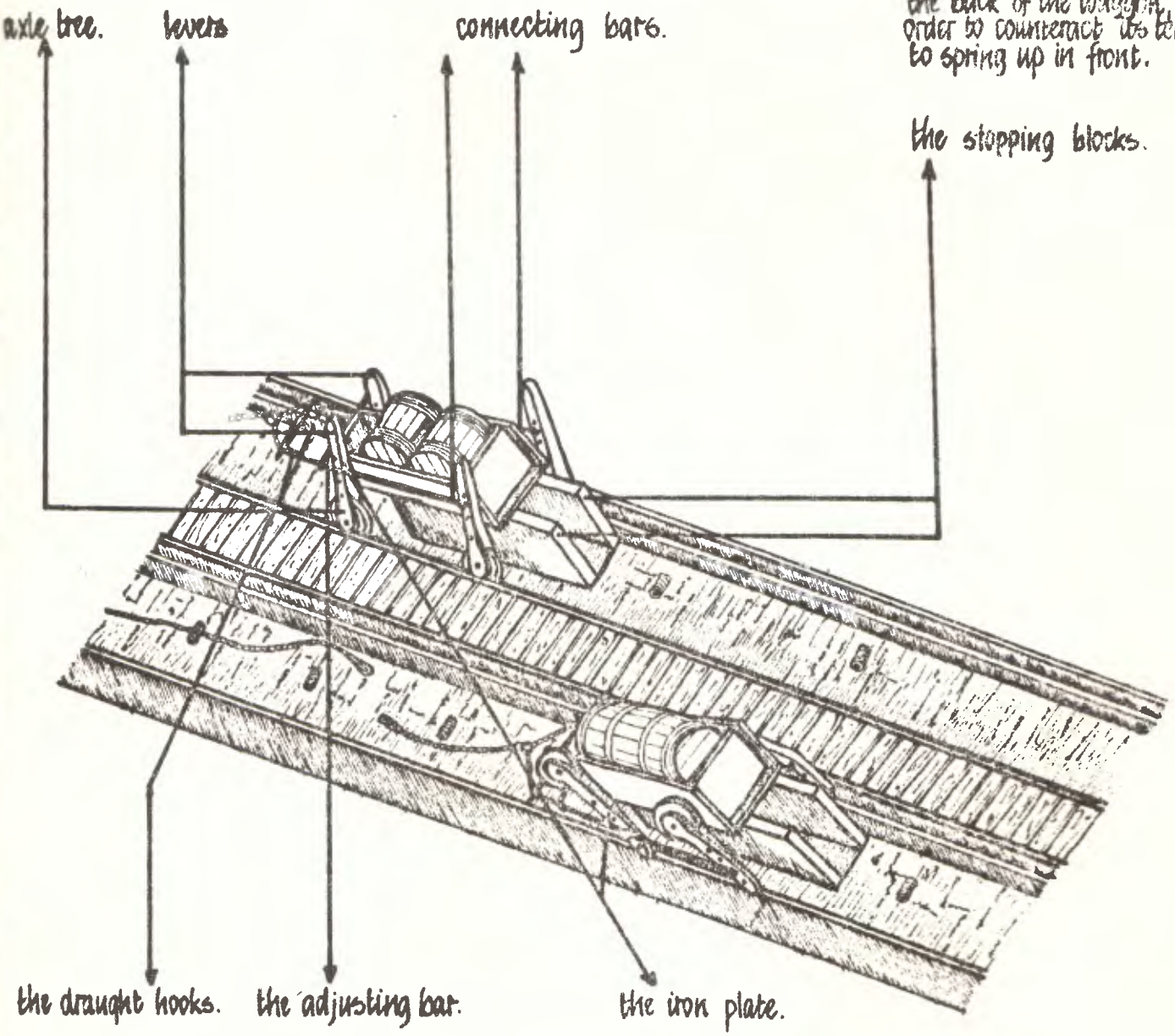
Mr Hoar's solution is shown on page 12 and was amplified by the following comments.

1. The draught alone keeps the waggon on its wheels.
2. The tendency of the waggon to fall is increased or diminished by a greater or less inclination of the four levers; or by the draught-hooks being placed nearer to, or farther from, the axle-trees. But the levers might be adjusted so tenderly, that the slightest jerk of the hawser, especially in descending, would throw the waggon off its wheels.
3. Any one lever will move the other three. And one man's power so applied, when the draught is on, can replace a loaded waggon on its wheels, which, without the draught, would require great power to effect.
4. To throw a loaded waggon, properly adjusted, off its wheels, requires greater power than to raise a loaded one on to its wheels. In one case the draught acts as an opposing, in the other as a helping power.
5. The chief peculiarity, it will be observed, in the inclination of the carriages, consists in the revolving axle-trees. The wheels become, as it were, the fulcrum, in raising the carriage on to its wheels; while the draught is the power which alone keeps the carriage up. The consequence is, that, whenever the draught happens to be severed by accident, or otherwise, the carriages instantly lose the accelerating influence of their wheels, drop bodily to the ground, clinging, by dint of friction, safely to the bed of the plane.

4 iron-cased levers, forked at their lower extremities to admit the wheels, and strongly bolted to the square ends of the two revolving axle-trees; thus each axle-tree, and its two levers, obviously revolve together.

2 connecting bars of flat iron connecting the four levers, the extremities of each bar working loosely upon a round-shouldered bolt fixed in any of the three holes in the levers; and, being thus alike centred, these bars, as the levers fall, follow round parallel to the plane and take position as those in the lower waggon.

The stopping blocks, having strong stumpy spikes projecting about 2 ins. (50 mm) out of their under cage, which stick into the surface of the plane when the waggon is thrown off its wheels, by the breaking of the hawser. These blocks, with the waggon, drop only a few inches and project about 2 ft (600 mm) beyond the back of the waggon, in order to counteract its tendency to spring up in front.



the draught hooks, centred and playing easily upon the front bolts of the connecting bars, so as to follow the levers round in the same parallel position as the bars. The adjusting bar is to adjust the inclination of the levers.

the two prongs of an iron plate admit the adjusting bar, and a pin passing through them prevents the levers from falling; thus, when the waggon approaches the level, either at the summit or the foot of the plane, the pin is inserted, and it will run on its wheels forward or backward, as a common waggon.

Two waggons,-the upper one ascending or descending; the lower one stopped, being thrown off its wheels by the breaking of the hawser.

When Mr Hoar returned to England it was said that he deposited "a large working model of his contrivance in The National Gallery of Practical Science in Adelaide Street London". One is lead to wonder where this is now and could it possibly be found and returned to the island?

After the transfer of Saint Helena to The Crown in 1834, The Inclined Plane fell into disrepair until 1871, when it was reconstructed by the Royal Engineers for the sum of £846, and since that date it has been used as a ladder only.

The resulting statistics of The Inclined Plane are:

Length of slope - 924 feet

Vertical Height - 602 feet

Number of Steps - 700

Rise of Steps - 11 inches

Starting angle at bottom, 39 degrees and after a small deviation towards the centre it rises to 41 degrees for the last 230 feet.

In conclusion the writer is pleased to note that the Ladder and Inclined Plane is scheduled as first class by Crallan[1] who states "of prime historic and topographical interest".

Let us hope that such applied terotechnology will not be lacking and this interesting structure will be preserved for all time.

1 See Island of Saint Helena
"Listing and preservation of buildings of architectural and historic interest" Hugh P. Crallan M.A. Architect 1974.