LOCOMOTIVE COTTON PRESS.

CONSTRUCTED BY MESSRS. APPLEBY, BROTHERS, ENGINERS, LONDON.

(*For Description, see the opposite Page.*)

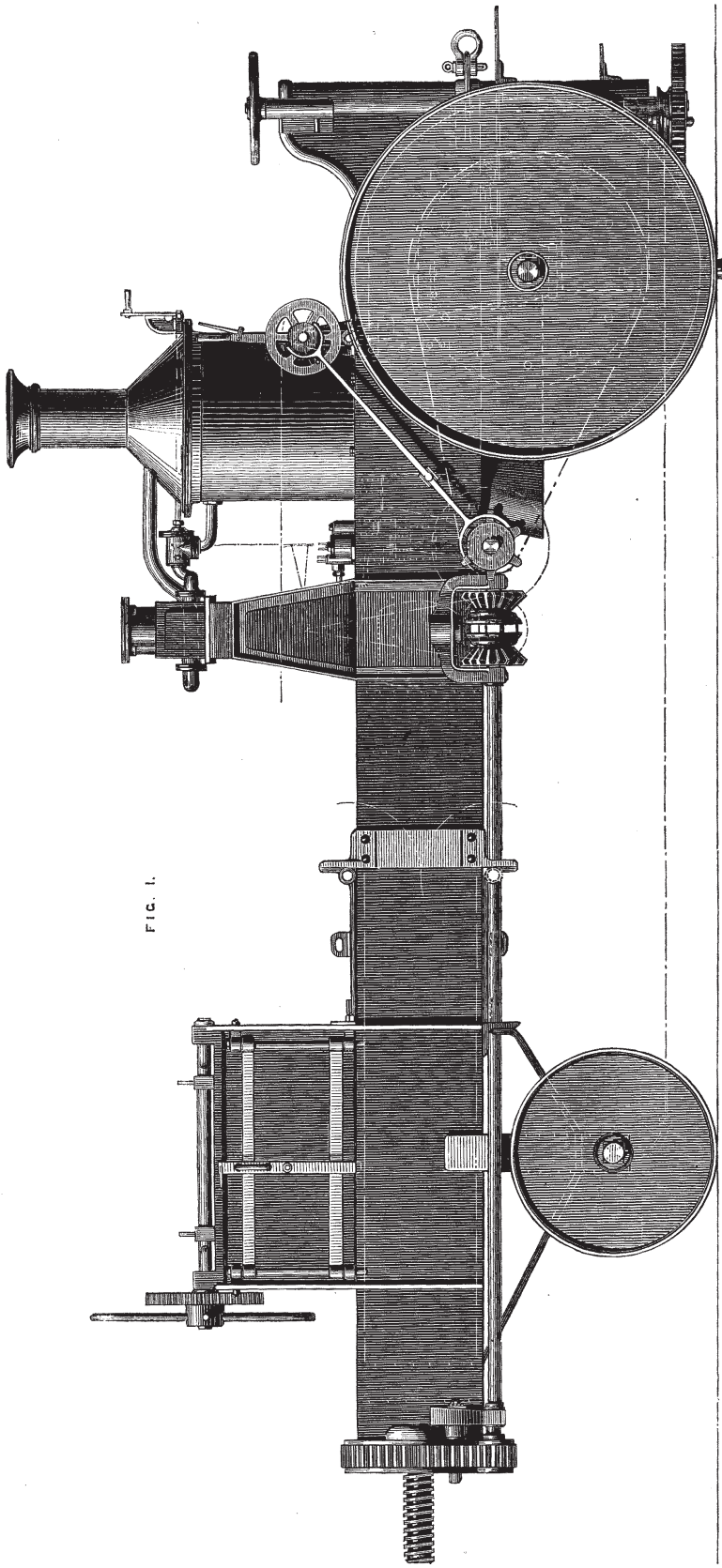

FIG. 1.

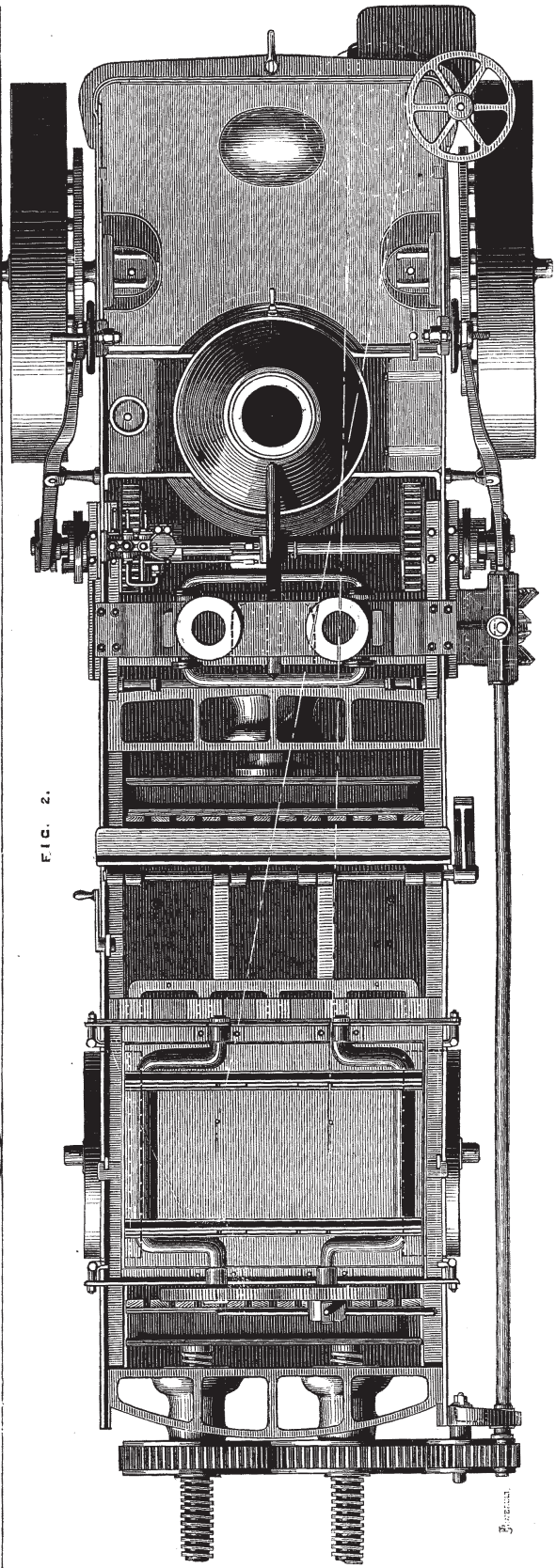

FIG. 2.

APPLEBY'S LOCOMOTIVE COTTON PRESS.

MESSRS. APPLEBY BROTHERS have just completed a locomotive cotton press, which we illustrate on the opposite page, and which is a machine greatly required in cotton-growing districts. It will be almost invaluable in India, where many of the cotton growers have no presses, or such indifferent ones that the cotton is not compressed half as much as it might be. Its great advantage is its great power and portability. The press and steam power for working it are fixed on one frame, and carried on four wheels—two driving and two steering wheels. It has a vertical multi-tubular boiler to supply steam to a pair of steam cylinders fixed on a strong vertical frame. On the crank-shaft there is a pinion which drives a spur-wheel on an intermediate shaft; on each end of this shaft is a chain pinion, each of which can be thrown into and out of gear by means of clutches worked from the footplate. From these chain pinions, a wrought iron pitched chain passes over a chain wheel fixed on the inside of each driving-wheel. The driving-wheels can be driven separately or together, as may be required. When turning sharp curves, only one wheel is driven, the other being free to revolve or stand still. The steering wheels, the centre and axle of which are under the box of the press, are steered from the footplate. The box of the press is arranged horizontally, and when filled the cotton is compressed a given distance by means of two screws, which work rapidly with the first and light pressure. The finishing and heavy pressure is done by the hydraulic ram at the other end of the box, and this ram is supplied with water under pressure from a small pump worked by the engines.

In order to form a bale, the bottom and top boxes are charged with the required weight of cotton: then the top follower is released, and, by its weight, the cotton in the top box is pressed into the long horizontal box, the top follower now forming part of the top of the bottom box, and being held firmly in place by the lifting cranks which are now on their centres. The screws are then set to work, and compress the cotton forward against the follower of the hydraulic ram. When the screws have worked their distance the hydraulic double-acting pump goes on working, and the ram gives the final compression, ending at a pressure of about 2 tons per square inch on the area of the ram. The area of the ram is 50 square inches, giving a total pressure on the bale of 100 tons. The bale is then hooped and rivetted in the usual manner, after which the doors at top and bottom of the horizontal box are released, and when the ram and screws have been run back a short distance the bale is pressed out by a lever, and is ready for transit. This machine can make one bale in seven minutes.

The two screws and the ram of the hydraulic press are set to work at the same time; but as the screws compress the cotton 4 ft. in 30 seconds, and the ram takes 2½ minutes to travel 1 ft. 1½ in., the result is the ram has travelled a very short distance during the time the screws have made their whole stroke of 4 ft., and the ram then has to compress the bale 10.8 in. under the heaviest pressure.

The lids of the horizontal box, where the cotton is when fully compressed, are balanced, that is, the top lids, which open upwards, balance the bottom lids, which fall downwards by means of a pair of spur segments on the ends of the spindles projecting on the outside of the frame.

The capacity of the box to contain the given bulk of cotton put in by hand is equal to 7, and when the screws and ram have made their strokes the bulk of the bale is only 1, the loose cotton being compressed to $\frac{1}{7}$th of its original bulk. But when the bale is bound and taken out of the press it expands about $\frac{1}{8}$th, making the finished bale 4 ft. × 1 ft. 9 in. × 1 ft. 9 in.

The hydraulic cylinder and cross girder are cast in one piece, and are of steel—an illustration and description of this casting has already been given in our journal. The side plates of the framing, and various other parts, are also of steel, it being most desirable to make the whole machine as strong as necessary with the least weight.

Arrangements are made to drive with a strap a second press, which can be drawn behind the locomotive, so that time is saved in packing a given quantity of cotton. The two presses can turn out two bales in ten minutes, in place of two bales with one press in fourteen minutes. In fact, arrangements are made in the locomotive to drive two presses besides its own press, making a total of three presses at work at the same time—the cotton of one or the other being compressed while the cotton in either of the others is being put in, or the bale being bound and taken out.

The ram is double acting, that is, there is an annular ring

in it of sufficient area to allow the hydraulic pressure to force it back after each bale is hooped.

Messrs. Appleby Brothers are thinking of making a modification in their design; they consider it will be more convenient and better to have the boiler and engine as a locomotive or traction engine only, and each press on separate carriages, with its own pumps, &c., complete, and each to be driven by straps from pulleys in the locomotive, or traction, engine, the engine being designed to draw the presses after it along common roads, like so many trucks.

The whole arrangement of the machinery is very effective and simple. When being transported along common roads, only one driver and assistant will be required to it, and when packing the cotton the native labour in the neighbourhood is quite sufficient in addition to the driver.

This press has been designed to let out on hire to the cotton growers while the packing is being done. In fact, it will be to the cotton farmer what the thrashing machine and portable engine are to the English farmer. It can be taken on a truck on any railway from station to station in the cotton district to pack the cotton at each depôt or store, and can by its own tractive power proceed along ordinary roads to the depôts in the cotton fields, where it will pack the cotton while it is clean and before it can be adulterated.

There is immense waste and deterioration in the quality of the cotton from the present mode of conveying unwieldy and loosely packed bales from many parts of the interior to the railway stations and ports. All railway officials object to carry unwieldy and loosely packed cotton. The bridges and tunnels along the Indian lines were constructed for ordinary loads, and will not admit of the passage of the great bulk that a railway truck could carry of loosely packed cotton. It is costly carriage running a truck with a light load some hundreds of miles, and then running the truck back empty. In fact, if the cotton was compressed to only the half, half the number of trucks only would be required. The saving there would be in carriage is self-evident.

The chance of taking fire is not nearly so great when the cotton is compressed to, say, $\frac{1}{5}$th of its original bulk, for two reasons: first, there is far less surface exposed to chance sparks, and, secondly, if a spark does fall on a compressed bale it will probably die out before any damage can be done.