# Daw Mill Colliery

## *Sinking No. 2 shaft*

**Fig. 1—No. 2 shaft permanent and sinking headgears**

**When Daw Mill Colliery came into production at the end of March, 1965 (an article describing the layout and equipment appeared in COLLIERY GUARDIAN for April 23, 1965, pages 562-564), it had a double distinction. It was the first new pit in Warwickshire for 37 years and it was also the most advanced pit in the West Midlands Division of the NCB in the application of electronic and other remote control devices.**

**To understand why a colliery was established at Daw Mill at all needs a little investigation into pre-Vesting Date history.**

For many years workings in the coal seams of North Warwickshire have progressed steadily southwards. By 1927, Kingsbury Colliery's workings were three miles south of the shafts which had been sunk some 30 years earlier, and underground transport and ventilation over that distance were becoming increasingly costly and difficult.

The colliery company therefore decided to sink a new shaft, called Dexter, on the southern edge of the workings. Coal was eventually raised in this shaft and transported overland to Kingsbury Colliery.

As the workings continued to move south from the Dexter shaft, the sinking of the existing shaft at Daw Mill was started in July, 1957. This was originally intended to be a ventilation shaft, but it was subsequently decided to establish a new colliery at Daw Mill, using the Dexter shaft for ventilation. Coal raising started in March, 1965.

The eventual need for a second shaft at Daw Mill was envisaged because it was known that the workings would continue to move southwards, and ventilation *via* the Dexter shaft more than three miles to the north would become increasingly difficult and costly.

### PRELIMINARY WORKS

The contract to sink No. 2 Shaft was awarded to Cementation Mining Ltd. in August 1968 and setting out for the surface works began before the end of the month. Site preparation required the excavation of about 100,000 tons of soil and sandstone from an embankment to provide a level area some 80 yards from the No. 1 Shaft.

Building of the permanent winding engine, engine house and headgear was carried out concurrently with construction of the shaft collar and fan drift. To speed up completion of the various stages of the scheme, the NCB decided to take the unusual course of installing the permanent steel headgear over the shaft at an early point in the sinking. Normally a temporary headgear is used for sinking and the permanent structure follows later.

The headgear (Fig. 1), 83 ft. high had previously been used at Albion, a now closed colliery in South Wales. It was re-assembled alongside the shaft collar, mounted on rails and winched into its permanent position in January 1969. The 1,700-h.p. electric winding engine was moved from nearby Arley Colliery—which closed last year—and was re-assembled and put into commission on January 21, 1969. At this stage the regular shaft sinking equipment was installed, the depth of shaft then being 98 ft. 0 in.

### SHAFT SINKING OPERATIONS

Planned and going to schedule is the sinking of a shaft 18 ft. 0 in. diameter to a depth of approx. 1,800 ft. from the shaft collar (Fig. 2), a fan drift and a pit-bottom inset at 1,765 ft. below the collar. The shaft is lined with concrete with a minimum strength of 4,000 lb./sq. in. after 28 days, being reinforced in the collar and at the inset. The minimum wall thickness is 15 in. to a depth of 510 ft., 18 in. to a depth of 900 ft., 21 in. to a depth of 1,660 ft., and 24 in.

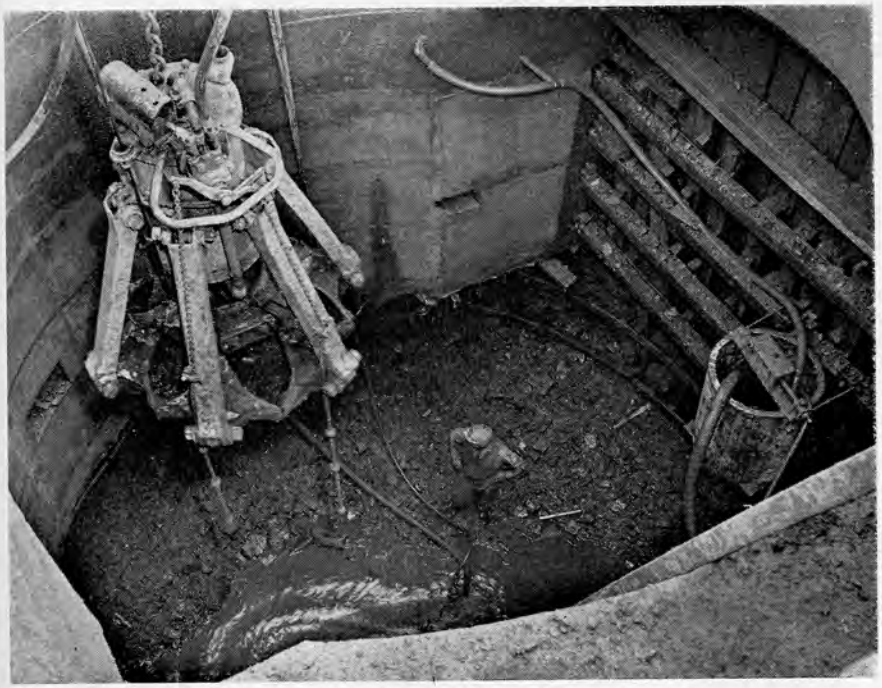

Fig. 2—Looking into shaftcollar—cactus grab on left

thereafter, sulphate resisting cement is used throughout. The shaft is to be furnished with rigid guides supported on steel buntons at 10 ft. 0 in. intervals.

The winding engine has a cylindrical drum 15 ft. 0 in. in diameter and is fitted with a single rope $1\frac{1}{8}$ in. diameter for the sinking. The present a.c. motor is rated at 1,600 h.p. allowing a maximum load of 9 tons at the drum. The scaffold capstan engine is a Ferlie double-drum hoist rated at 40 tons driven by a 50-h.p. motor. The capstan is fitted with $1\frac{1}{4}$-in. higher-tensile locked-coil ropes each with a breaking load of 94 tons.

The concreting scaffold was originally a seven deck design with a height of 42 ft. but this has been reduced to four decks with a height of 22 ft. to facilitate easier movement within the shaft (Fig. 3). There is a 5 in. Gardner-Denver steam pump on one of the intermediate decks and a surge tank on the other for the shaft water during sinking.

Concrete formwork consists of eight rings, 2 ft. 6 in. deep resting on a kerb-ring which is suspended by nine M.S. hanging rods $1\frac{1}{8}$ in. dia. which are embedded in the concrete wall. Ready-mixed concrete is lowered into the shaft by a 2 cu. yd. capacity bottom-discharge skip on the winding rope.

The shaft crew consists of seven men with a supervisor on each of three shifts (Figs. 4 and 5). They are presently drilling 6 ft. 0 in. deep rounds using Holman Silver Three Handrils. Blasting is supervised by the colliery deputy using $\frac{1}{2}$ sec. delay detonators and polaranmon gelignite.

Loading out is accomplished by a Cryderman shaft mucking unit manufactured by Shaft Machines, Toronto, Canada (Fig. 6). This unit is suspended from the shaft wall on insert bolts set in the concrete. It is raised and lowered by means of a $\frac{3}{4}$ in. dia. locked-coil rope on a surface-mounted capstan winch. The unit is essentially a clam shell bucket of 8.25 cu. ft. capacity mounted on the end of a telescopic boom. The boom can be slewed to reach all points of the sump as well as being raised or lowered to deliver into the hoppit. The machine is controlled by one operator standing on a platform above the boom. There are two joystick type controls and it is powered by compressed air.

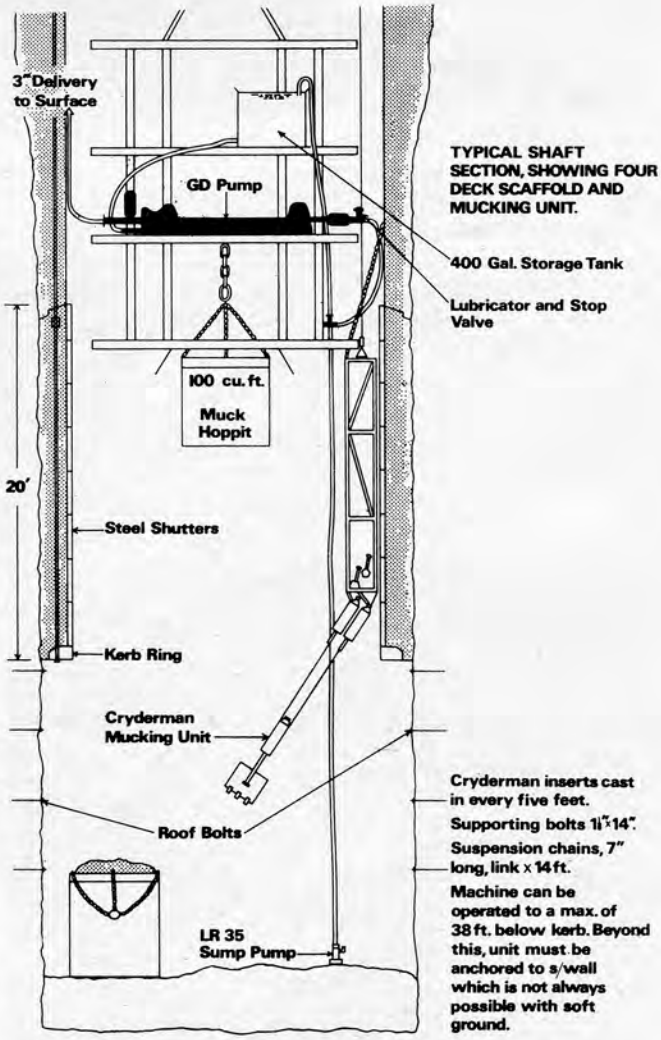


Fig. 3—Typical shaft section showing 4-deck scaffold and mucking unit

For mucking out there are two hoppits each having a capacity of 100 cu. ft. One is in the process of being

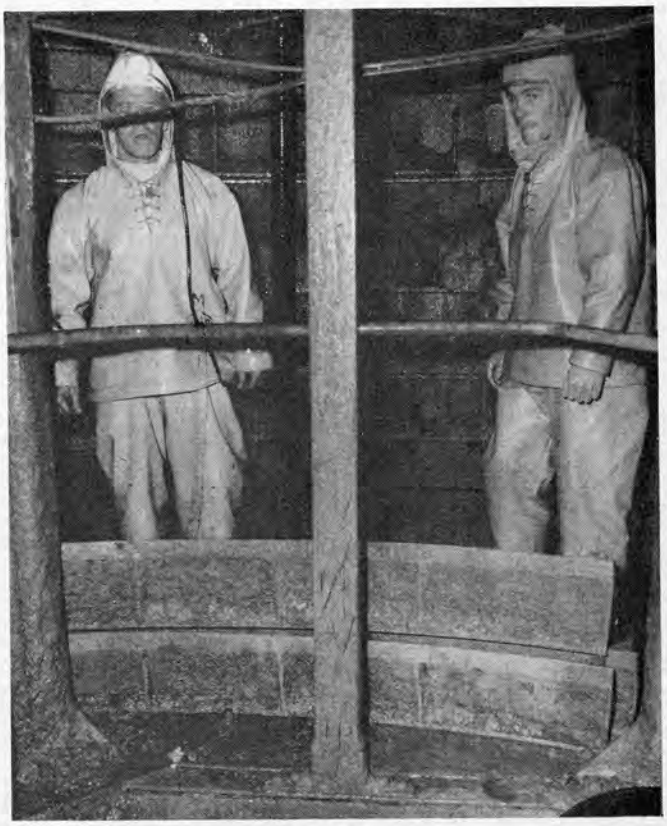

**Fig. 4—At work 1,000 ft. below ground level**

loaded as the other is hoisted and dumped by lazy-chain at the surface into 10 cu. yd. Scammell dump trucks.

## GROUND CONDITIONS

The strata sunk through to date has been marl and sandstone in alternating beds of considerable differences in thickness. The sandstones have varied from soft red to strong red with fissures and strong greys. The marls vary in hardness, often being soft and very incompetent. The excavated ground is supported by 4-ft. 0-in. roof bolts and BRC wire mesh, 10 SWG with 3-in. squares. It has been found advisable to limit the depth of open ground to approx.

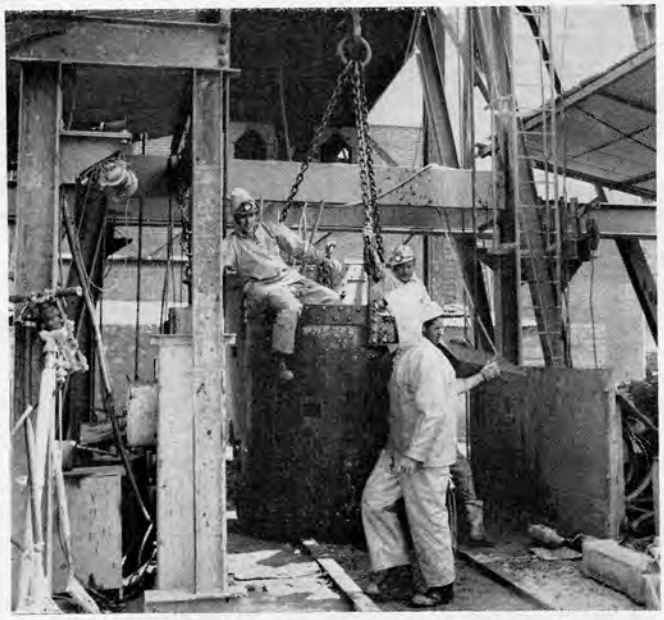

**Fig. 5—Sinking crew returning to surface in kibble**

**Fig. 6—Cryderman shaft mucking unit being lowered**

30 ft. but occasionally only 10 to 12 ft. has been possible before walling.

Information obtained during the sinking of No. 1 shaft indicated the maximum make of water in any length would be 30 gal./min. but in the fissured sandstone 150 gal./min. was encountered at a depth of 168 ft. and 60 gal./min. at 300 ft. This slowed down sinking rate in the early stages but progress is now exceeding 50 ft. completed work on a six day week. The maximum achieved so far being 60 ft.

## CONCLUSION

The sinking is expected to be completed by the end of 1969 or early 1970, and after being equipped the shaft will first be used for transporting men, supplies and debris. Its ventilating duties will start some six months later—after the necessary connecting tunnels have been driven.

The shaft top will have the normal air lock, housing modern mine-car handling equipment, and there will be a covered man-walking gantry to the pit head baths.

The shaft and associated services and equipment will cost about £1 million. More efficient services accruing from the scheme will help Daw Mill to raise its annual output potential to around a million tons a year.

In the year ended last March, Daw Mill produced 760,000 tons at a productivity rate of 59.3 cwt. a manshift. The national average figure was 42.5 cwt. The colliery currently employs 1,100 men.