cessfully, but one must have extra help to place the tile quickly and hold them in place while weighing them down with black dirt.

From experience I would estimate cost of operation and upkeep on the following basis: 20 gallons gasoline per day; one-half gallon lubricating oil per day; 2 gallons black oil per day. It is well to use plenty of cheap black oil. If the chains and gears are kept thoroughly lubricated the life of the machine will be doubled or trebled. The only part that cannot be lubricated and is bound to wear are the sprockets that drive the digging wheel. These wheels work in mud and grit and a set of them will be worn out in digging about 15 miles of ditch.

The tiling machine has 4 digging speeds ranging from 3 to 10 feet per minute, and a road speed of 2 miles per hour. Under average conditions these machines can dig from 60 to 150 rods per day.

I have had considerable experience with many kinds of farm machinery including grain binders and tractors but I know of none which will perform the work for which it is designed more efficiently or economically than the tiling machine.

DRAINAGE DEVELOPMENTS IN WASHINGTON COUNTY AND VICINITY

C. F. Leins, West Bend, Wis.

In eastern Wisconsin tillable upland is worth from $125.00 to $200.00 per acre. The marshes consisting of clay, muck, and peat are usually very fertile when drained and properly managed. These marshes as a rule are parts of adjoining developed farms. The farmers of the locality are thrifty as a class, and try to make use of every foot of arable land. These conditions make a fruitful field for drainage. Many have attempted to drain by means of capstan plow ditches, but nearly all who have done this have been disappointed in not getting the thorough drainage they expected. Others have tiled their wet lands into natural outlets. Still others were not so fortunately situated, and were compelled to put in outlet ditches before they could tile.

I have had the fortune, or perhaps you would call it misfortune, to serve as a commissioner in the five districts organized in Washington and adjoining counties.
The first of these districts, Belgium-Holland No. 1, was completed three years ago. On this job we of course made some of the mistakes that inexperienced commissioners are heir to, but taken as a whole we have a pretty good ditch. The crops raised in this district as a result of drainage materially improved the sentiment for drainage in the locality.

The other four districts are completely organized. On two of them construction work is in progress now, in the third district, the Belgium-Holland No. 2, the dredge is on the job ready to begin work in the spring. In this district the ditch furnishes outlet for the sewage system of the village of Belgium, subject to the approval of the state sanitary engineer.

The maximum cost per acre for the main ditch in these districts is as follows:

- Belgium-Holland No. 1  $36.00 per acre
- Belgium-Holland No. 2  25.00 per acre
- Jackson-Germantown     21.00 per acre
- Hartford-Addison        20.00 per acre
- Rockford-Polk (estimated) 25.00 per acre

The cost of tiling, clearing, etc., added to the cost of the outlet, frequently brings the total cost of reclaiming this land up to $75.00 per acre. Reclamation of our marshes even at this price is a good investment.

Most of this land will be cropped as soon as drainage makes it available, but only a few of our farmers know how to manage marsh land successfully. The drainage and development of marsh land could be greatly stimulated if a demonstration field were conducted under expert direction in each of our drainage districts. In this way farmers could observe what good drainage does, and note the kind of crops which are adapted to growing on drained marsh lands. They would be convinced that good drainage pays but that the money spent for makeshift ditches is usually thrown away.

BIG TILE IN PLACE OF OPEN DITCHES
A. K. Reindahl, Madison, Wis.

The Starkweather Drainage District contains approximately 3,000 acres of what formerly were marsh lands and is located immediately east and northeast of the city of Madison.