

The motor is pumping from an underground tank 12ft. deep, and lifts 1,400 gallons per minute, equivalent to 155 miners' inches. The present model is guaranteed to produce ten horse-power, but under the most

favourable conditions it will yield fifteen or twenty horse-power.

The solar motor is a complete solution of the question of making use of the surplus sunshine and underground waters of the deserts.

XVIII.—AN INGENIOUS ENGRAVER.



Mr. Samuel E. Dibb is an engraver employed by the "Grip Publishing Company," of Toronto. Mr. Dibb, although not claiming to be an expert engraver, and without any previous trials, set himself to beat the New York engraver. Just how far he succeeded the accompanying illustrations will show. Selecting an ordinary-sized pin, 1 1/8 in. long, and with a smooth head, he first drove the pin into the end of a soft wood block for convenience of handling, and then with the aid of an ordinary magnifying-glass, and with what is known among engravers as a "No. 1 tint" tool, proceeded with the engraving in the manner shown in the illustration. It is not so much to skill that Mr. Dibb attributes his success as to being the possessor of a very steady hand. On the first pin tried he engraved the alphabet, all the letters being cut in relief. Not content with this performance he next cut on the same-sized pin all the letters of the alphabet,

MR. SAMUEL E. DIBB ENGRAVING ON THE HEAD OF A PIN.  
From a Photograph.

A FEW years ago a man engraved the Lord's Prayer on a United States 3-cent piece (exactly the same size as an English threepenny-piece), and the achievement was talked of all over the world. An engraver in New York undertook to beat that record, and he engraved the alphabet in capital letters upon the head of a pin. This feat was greatly talked about, the New York papers giving portraits of the engraver and drawing representing the pin in its actual size and magnified forty-five diameters. The pin was exhibited in public and optical institutions. But this performance has been quite eclipsed, and with it all previous records, by a young man in Toronto, Canada.

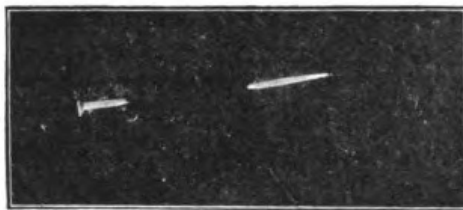


ENLARGEMENT OF A FIVE-CENT PIECE—THE SIZE OF A THREEPENNY-PIECE—  
From a] ENGRAVED BY MR. DIBB. [Photograph.

the figures from 1 to 10, and the year 1899.

Mr. Dibb next turned his attention to engraving on a Canadian five-cent piece, which is the same size as an English three-penny-piece. After polishing the surface of the coin on one side he cemented it to the surface of a small block of wood to enable him to handle it more readily, and then with the same glass and tool which he had used to engrave the head of the pin he engraved on the coin the following: the Lord's Prayer, the Ten Commandments, his name and address, the date, Oct., 1898, and the words, "There are 1,593 letters engraved on this coin." To the naked eye the surface of this coin merely seems to be roughened with indentations, but when examined with a powerful magnifying-glass everything claimed to be upon it was found to be there in capital letters, and evidently with plenty of room and no evidence of crowding. We reproduce on the preceding page an enlarged photograph of the coin.

After finishing this coin Mr. Dibb believed he could do still better, and started on another coin the same size as the first one used. He had engraved the Lord's Prayer, the Ten Commandments, and part of the xix. Psalm, and with all this, which was more than was on the entire surface of the first coin, he had only used half



THE ENGRAVED PIN, ACTUAL SIZE.  
From a Photograph.



THE BLACK DOT REPRESENTS THE HEAD OF THE PIN ENGRAVED.  
From a Photograph.



ENLARGEMENT OF THE PIN'S HEAD, SHOWING THE ENGRAVING.  
From a Photograph.

of the space on the face, when much to his dismay the coin was stolen and no trace of it could ever be found. But Mr. Dibb, with a true British spirit, would not be beaten, and again turning his attention to pins he engraved on the

pin which has been sent to THE STRAND MAGAZINE in order to prove that all that is said is correct, the following: "A B C D E F G H I J K L M N O P Q R S T U V W X Y Z, and 1 2 3 4 5 6 7 8 9 0. THE STRAND MAGAZINE welcomes the New Century 1901."

In all there are seventy-eight characters in capital letters. The accompanying photo., showing the pin's head enlarged, does not show up the work as well as can be seen by looking through a strong magnifying-glass. The work of engraving this pin-head took Mr. Dibb four hours, and we think this beats all previous records in this line. We found it very difficult to secure a good photo. of the pin, as the camera distorted it somewhat, but the difficulty was partly overcome by placing the pin-head pointing out of a board and then placing the same glass that was used in the engraving of the pin directly over it, and the camera at a distance of about 3ft. The exposure gave a negative about one-quarter of an inch in diameter. The photo. here produced was enlarged from a print of this negative.

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## XIX.—THE MOST DESTRUCTIVE PROJECTILE EVER INVENTED.

IN spite of Peace Conferences and humanitarian efforts toward the suppression of warfare, the man who can invent the weapon calculated to wreak, in the shortest possible time, the greatest possible destruction of life and property is still a popular hero and certain winner of wealth and glory.

Year by year the power of these death-dealing agencies has increased until the possibilities would seem to be exhausted, but now to inaugurate the new century comes a gun

apparently more deadly than any of its predecessors.

It is the invention of Louis Gathmann, of Chicago, and after a series of exhaustive tests has just been officially adopted by the United States Government. It will be of 18in. bore, and will throw 600lb. to 800lb. of gun-cotton a distance of five miles.

This new Gathmann arm, in a word, is a high explosive projectile, with a gun for firing it. It makes possible the use of