ing their children taught classics or those branches of science or mechanics which are likely to be of service to them in after life. The question of technical education would, therefore, be one of the first objects a Dominion Mechanics' Association should have to take into consideration for the future benefit of the industrial classes.

To be brief, the writer would suggest that in every city, town, and village in the Dominion, the mechanics should form themselves into an association for the pronotion of useful knowledge among themselves, and for benevolent purposes, and that in each place a deputy should be appointed to communicate with some party to whom they could entrust the management of these interests. He would suggest that the name given to such an organization should be

THE DOMINION MECHANICS' ASSOCIATION.

## Its objects should be :---

lst. For the formation of a Reference Library, to consist of works on Science, Manufactures, Inventions, Statistics, Machinery, Patented Inventions, &c., and that each member should be entitled to information from the same, subject to certain rules and regulations. Towards the support of this institution the Dominion and Provincial Governments should be petitioned to give annual grants for books, and also that all Municipalities should be requested to contribute a small sum annually towards the same. The formation of a Reference Library would tend greatly to the advance of knowledge.

2nd. For the promotion of useful knowledge among the various trades, and for meeting together for friendly discussion, and disseminating useful information through the columns of such scientific or mechanics' magazine as they might select for that purpose.

3rd. For forming a Mutual Benevolent Fund for sick members, widows and orphans.

4th. For the purpose of offering prizes to its own members for the best essays, designs, &c.

Of course, such an association would have to be supported by small annual contributions; the amount of such contributions would depend much upon the number of its members.

The writer trusts that the subject will receive the estrust consideration of all connected with the industries of the country. We trust that the mechanics will awaken to the importance of unity and action, and to a lively sense of their own weight and power when a united body, and of their weakness when divided. Let them place a true estimate upon their influence, when better instructed and better organized, upon the welfare of the Dominion.

The writer will be happy to receive communications, from readers of the *Scientific Canadian*, giving their views upon the subject, and from all desirous of becoming members of this Association.

**READERS of the SCIENTIFIC CANADIAN desiring to obtain** any of the books which were advertised on the back cover of the MAGAZINE last year, are requested to address their communications direct to F. N. Boxer, Editor SCIENTIFIC CANADIAN, 243 St. Denis street, Montreal, which will save time frequently in the execution of their orders.

TO REMOVE GLASS STOPPERS.----To move a tight glass stopper, hold the neck of the bottle close to a flame, or take two turns of a string and seesaw it. The heat engendered expands the neck of the bottle before the expansion reaches the stopper.

## BOILER BRACING.

The Engineer-in-Chief of the United States Navy, in a recent report on experiments in boiler bracing, gives the result of some interesting trials on the strength of screw stay bolts. The average strain in pounds required to pull the 1 inch or 12-inch bolts through the 2-inch iron plate, was as follows:

WITH SUPPORTS 4 INCHES FROM CENTRE TO CENTRE.

1-inch holt, not riveted	21,970
1-inch belt, ordinary low conical head, three threads left through	25,147
l-ineb bolt, button head; length of belt left through for riveting equal to 7-16 diameter of bolt.	33,791
12 inch bolt, button head; length left through for riveting equal to one-half diameter of bolt	38,885
WITH SUPPORTS 5 INCHES FROM CENTRE TO CENTRE	<b>5</b> .

 1-inch bolt, ordinary low conical head.
 22,137

 1 inch bolt, button head; length left through for riveting equal to
 31,259

 7-16 diameter of bolt.
 35,819

The cause of the inferiority of the ordinary low conical head bolt is explained in the following way: It was observed that the bulging of the plates caused the lap of the rivet head on the plate to commence giving way or break off some time before the maximum strain was reached, thus leaving more for the threads of the bolts to sustain. As the strain and bulge of the plates increased, the plate around the bolt turned downward and outward, until the threads in the plate almost entirely cleared those in the bolts, so that in almost every case there were only from one to two threads stripped or injured on the bolt when it drew out; therefore, it was deemed advisable to form the head in a different manner, and after several experiments it was decided that the rivet-head should be made as follows: First, by having as much of the bolt through the plate as could be riveted over without injury to the iron, which was, in case of the superior iron being used, equal in length to about one-half the diameter of the bolt.

ANTI-FRICTION CAR-AXLE BOXING .--- A new style of car-axle boxing is now being introduced at the east which is described as follows : Two friction wheels are employed in the box, running in line, each having a seven-inch face and giving a leverege between their periphery and axle of 75% to overcome? friction, one of them, 101 inches in diameter, placed nearly over the axle, say at angle to a vertical line of the axle of about 15°; the other, six and one-half inches in diameter, is placed down on the side of the axle and operates as a shoulder wheel. By placing the wheels in this position the oblique action is largely done away with, sufficient only being retained to hold the axle in its proper place, and not allow it to come into frictional contact with the The friction wheels have steel axles journalled in brack In the casing under each of these journals is an oil for lubricating the invested at the second seco asing. boxing. reservoir for lubricating the journals through waste, oil being sup-plied through channels extending out to edge of housing. The plied through channels extending out to edge of housing. channels have covers to keep out dust, grit, etc. A number of advantages are claimed by the inventor over the old style of box-ing : 1. That it is the lightest munice but the old style of box ing : 1. That it is the lightest running known, 50% easier than, the present system. 2. An important saving in lubricant, as it runs over 1,000 miles with one oiling. 3. That heating is pra-tically impossible. 4. Greater durability than the present sys-tem, as the friction wheals having a protem, as the friction wheels having a very broad head will of cut or make indentations. This boxing is the invention of Mr. Levi H. Montrose, of Seneca, Ontario county, N. Y.

'A LOCOMOTIVE ELECTRIC LIGHT. —A locomotive electric light has recently been introduced in England for railway use which is said to operate satisfactorily. It consists of a light six horse power four-wheel locomotive, with a dynamo-electric machine attached, and any electric light may be used. When the engine is moving along the line, the electric machine rotate at its proper speed, and when it is necessary to stop in order that the light may be directed on some particular spot, the driving wheel are thrown out of gear by means of the disengaging handle attached to the piniou on the crank shaft, and the machine coases to be a locomotive, while the engine continues to move the dynamo-machine at its proper velocity. The engine is furnismachine may be accurately regulated, this being very important in order to ensure a bright and continuous light.

To HARDEN MALLEABLE IRON. -- Mix equal parts of common potash, saltpetre and sulphate of zinc, and use as directed for prussiate of potash.