

tioned notices, unless the state applying for admission shall have named a later date.

The result of the Brussels conference, short as its sessions have been, is very important. Many amendments have been proposed in addition to those we have reviewed, but owing to lack of time no decision has been reached in regard to them. Another conference will therefore probably be held this year.

It is certainly in the interest of American inventors and American owners of foreign patents that the proposed amendments should be ratified by the United States. The privilege of having a foreign patent in a country of the union absolutely independent of patents in any other country will alone be extremely valuable in many cases. The provisions concerning trade marks will also be welcome to American manufacturers, especially in view of the tendency abroad to increase the sale of goods by fraudulently creating the impression that they are of American origin.

It is to be regretted that Germany, Austria-Hungary and Russia should keep aloof from this International Union, of which nearly every important civilized country of the globe is now a member. The accession of the four countries above named is eminently desirable in their own interest as well as that of the present members of the union.

THE NEW SINGLE FORGED CANNON.

The successful tests which have just been completed of the Hobbs single-forged gun, an account of which was given in our issue of February 12, are very gratifying in view of the necessity which exists for the rapid production of war material. The demand just now is for guns of the smaller sizes, such as the 4-inch, 5-inch and 6-inch, and it is in these sizes that the new system of construction will find its most useful application. The test to which the gun was subjected at Sandy Hook was a severe one, 100 rounds being fired, 5 of them with extremely heavy charges. The service charges gave a muzzle velocity of 2,700 feet a second, as against from 2,000 to 2,300 feet a second for the service 5 inch gun. The pressure in the chamber of the gun was 35,000 pounds to the square inch, and with the five heavier charges the chamber pressure rose to 49,000 pounds. This was endured without the least signs of failure.

The great value of the gun lies in the fact that it can be turned out in great numbers in a relatively short space of time. The forging is made in one piece, the necessary initial tension being obtained by cooling from the inside. The saving of time by this process over the old method of construction by shrinking on successive hoops is obvious. If matters should come to the worst, this gun must prove a valuable and opportune aid in the rapid fitting out of armed merchantmen for naval service.

THE REVERSING STEAM TURBINE.

It will be remembered by those of our readers who have been interested in the performance of the "Turbina" that the turbines with which it was fitted were not capable of reversing. This has been recognized as a serious defect in a motor which seems destined to have its most successful application and its largest field of usefulness in marine propulsion. For entering or leaving dock, for coming to an anchorage, making landings, and in the emergency of a collision, it is absolutely essential to a perfect marine motor that it shall be capable of instantaneous reversing. This the Parsons turbine could not do, and in order to remedy the defect the inventor installed a separate motor which was used to drive the boat astern. This was recognized as being a mere makeshift; for not only was the power of the "go astern" motor limited, but when the boat was in normal operation it constituted a serious dead weight to be carried for which there was no return. Moreover, for effective torpedo boat work it is absolutely necessary that the whole horse power of the engines shall be available for going astern at the moment of attack, if necessity should call for it.

Mr. Parsons was well aware of the defect, and after considerable experimental work has succeeded in producing a motor which will reverse, and secure almost as great a propeller thrust in going astern as when going ahead. The means by which this has been done are simple and ingenious. By means of butterfly valves and an alteration of the configuration of the blades it is possible to change the direction of the flow of the steam through the turbine. The valves are located at the points where the steam pipes connect with the steam passages, corresponding to the positions occupied by the steam chests in the simple or compound engines of the reciprocating type. The steam passes a butterfly valve and enters the cylinder at one end, passes through it and then returns to the opposite side of the valve. Here it is free to pass to the exhaust or to the condenser, according as the turbine is a simple high pressure or a condensing machine. In the case of a compound or a triple expansion turbine the steam would pass to the low pressure or the intermediate cylinder as the case might be.

The butterfly valves above each cylinder are connected by levers and may be simultaneously reversed by means of a single reversing lever. In the reverse posi-

tion the steam is introduced at the opposite ends of the cylinders and travels through them in the reverse direction. In going ahead the steam strikes upon the concave surface of the blades, in going astern it encounters their convex surfaces. It is evident that in the latter case the full efficiency of the turbine will not be realized, and to remedy this the inventors have designed a turbine with straight blades which have opposite convexities formed at the opposite edges of the blades, the object of which is to insure that the steam shall impinge on a concavity whether the motor is running in both the "go ahead" and "go astern" directions. By this means it is expected that an equal efficiency will be obtained in each direction.

We are of the opinion that the proposed blade will not prove so economical as that presenting a curved surface to the steam, and that in departing from the accepted type of turbine blade Mr. Parsons is sacrificing the efficiency of the motor in its normal operation. While it is obviously necessary that a marine motor should be able to reverse, it is not by any means clear that it must necessarily be able to develop as much power on the propeller when going astern as it does when going ahead. It is sufficient that a boat should be able to go astern at a fair rate of speed, and this is what the motor with curved blades would probably do, in spite of the fact that the steam was impinging on the convex side of the blades. We question the expediency of reducing the efficiency of the motors in their normal conditions of operation for the sake of securing equal efficiency under reversing conditions which will only occasionally be called for.

The detailed drawings and description of the new motor will be found in the SCIENTIFIC AMERICAN SUPPLEMENT of March 12, 1898, to which the reader is referred for a further study of this interesting subject.

VALUABLE ADVICE TO CATTLE SHIPPERS.

In the preparation of the quarterly report of the Kansas Board of Agriculture, devoted to "The Beef Steer," Secretary F. D. Coburn aimed to not only secure the views of those who are masters in beef production, but also avail himself of observations by others, among them those who deal with the stock when it reaches the market. None have a keener eye for the merits and defects of the beef animal, both as to his individual quality, condition and the treatment given him at home and on his way to market, than the salesmen who receive, care for and sell him to the slaughterer or shipper. From the counsel given by one of the most extensive live stock commission firms, the following excellent advice for every feeder and shipper is given, and is the result of very extensive experience and wide observation. They say: In the first place, a large majority of the feeders make a mistake in holding fat cattle that are ready for market; for instance, a man is feeding 100 to 150 head of steers, and there are, say, one-half or two-thirds of the cattle that are fat and could be shipped at any time. Very few men will ship them out, for the simple reason that all their cattle are not ready, and they hold on to the good ones until the entire bunch is ready. We are continually advising our customers to ship out all fat cattle as fast as ready. By doing so they divide their risk. The cattle that are left have a better chance to improve, and there is more profit to be made in this way on account of the small margin there is in keeping matured steers, as this class of cattle make little gain compared with half-fat steers. Another mistake that is made is in shipping cattle off grass. We have had a number of instances where our customers have shipped cattle that were fed on the grass without putting them in a dry lot for a day or two before shipment and feeding nothing but corn, oats and hay, and, by not doing so, the cattle on arrival look grassy, their hair looks shiny, they shrink almost double what they would if handled in the proper way, and they don't sell within 10 to 15 cents per hundred (and in some cases more) of cattle that are put in a dry lot and fed nothing but corn, hay and oats for a short time before shipment. Overloading is a very bad feature, but we might add that we are not troubled as much in this respect as we were before the charge of freight by cents per 100 pounds became established. A little advice on this subject is still quite necessary, as we have customers frequently who overload their cattle, and, as a result, they make an extra shrinkage; they do not look as well at market, which, as you are aware, affects the sale fully 10 cents per hundred pounds; this means a direct loss to the shipper of 10 cents per hundred, and the extra shrinkage, which is quite a large item, that could be saved with proper management.

The best investment a shipper ever made was in putting extra good bedding in his cars. This is a point which should be well looked after, as it means a big saving from loss of possibly dead or crippled cattle, as well as the shrinkage. We think another point that could be well covered would be, where parties are shipping stock, to classify it as much as possible. In this way the cars are more evenly loaded, the stock ships better and it also saves considerable delay upon arrival here. The work of sorting and shaping stock at this

end is a very small item, but, by classifying the stock in the country, it means economy of time at the market. Cattle handle better if they do not get too much water just before shipment. The golden rule in shipping all kinds of cattle is to get them as quickly as possible from range, ranch, farm or feed yard to market. Notably is this the case with rangers. It has been proved time and again that a range bullock shrinks every hour after he leaves his native haunts. It stands to reason that all cattle will do so, but natives do not fret, nor are they liable to get so bruised as the former.

Grass cattle, as a rule, do not ship well. On the pasture they look well, and many a buyer has been deceived by the appearance of a drove of steers in a grass field with full bite. To ship such cattle is a hard task, and is invariably disappointing, but it has to be done. Where convenient, it is a good plan to place such cattle in a pen and feed them hay for a day or two. The secret of shipping all classes of cattle is to place them on the cars full of feed, but with as little moisture as possible. If you ship a steer full of water, he is apt to have loose bowels and show up in the yards badly. Properly handled cattle should arrive in the sale pens dry behind and ready for a good fill of water; not over-thirsty, but in good condition to water freely. Many of our shippers think that by salting their cattle, or by feeding them oats, or by other scheming, they can fool the buyers. This is nonsense. The buyers are just as sharp as the owners, and while many of them say nothing, you often see them ride into a pen and out again without the courtesy of a bid on this account. Dozens of times we have seen this happen. It always acts against the shipper to use unnatural means. To eastern buyers it is a matter of great importance that cattle should be in good condition when purchased, so as to stand further shipment. When cattle drink too freely, they are apt to founder and break down. In this condition the dressed beef men can use them, but it stops competition, and as a natural consequence cattle often go below their value when in this condition.

The same rule applies to grain-fed cattle, whether in pasture or dry lot, as to the above. Only they are much more easily handled in shipment and do not show much distress in their changed circumstances. As to feed on the road, nothing equals good, sweet hay. It beats corn or other grains, because it is easily digested and does not fever the animals. Simple methods and simple feed are the best that can be used. As to water on the road, it is a matter to be decided on according to the weather. In midsummer care must be taken to supply animal wants, whereas in winter a steer can go for many hours without a drink. Good management in this line also calls for the arrival of stock at the yards in proper time. From 5 to 8 A. M. is the best time in the day to appear upon the scene—the nearer the latter hour the better—for cattle especially always look better when they are taken off the cars and have just been fed and watered. Then they have a bloom upon them which wears off very quickly.

Many feeders would be saved both disappointment and loss if, before sending in cattle to market, they would notify their commission house what and when they are going to ship. Then, if the commission merchant thinks the stock would be benefited by longer feeding, or that the prospect is unfavorable for the time the feeder expected to have his cattle in, he can so advise his client, and thus save him from sacrificing his stock or getting in at a wrong time. Especially is this important in November or the beginning of winter, when we are getting half-fat cattle that ought to have been held back thirty to sixty days longer at least. No doubt many of these look all right in the feed lot and appear to have good finish, but not having matured or ripened, they practically "go to pieces" on the cars, and in addition to loss through heavy shrinkage the owner has to accept a low price on the market. We wish every stockman would follow out this plan of giving notice a day or so ahead of the time he expects to ship. It works to the advantage of both the shipper and seller. The latter, being on the market every day, knows just what the market wants, and can judge pretty closely of near prospects. He is thus able to give his client the necessary advice and information he should have before he sends in his stock.

THE NEW DIRECTOR OF THE LICK OBSERVATORY.

At the meeting of the Regents of the State University of California, Prof. James E. Keeler, now at the Allegheny Observatory, was elected director of the Lick Observatory to succeed Prof. E. S. Holden, who recently resigned after twenty-five years of service. Prof. Keeler was educated at the Johns Hopkins University, and has made a great specialty of spectroscopic work. His most famous discovery was that the rings of Saturn were composed of small satellites. He recently delivered the address at the opening of the Yerkes Observatory. The gentlemen who were placed in nomination with him for the directorship were Prof. George Davidson, who is well known for his long connection with the Coast and Geodetic Survey, and Prof. M. Schaerberle, acting director at Mount Hamilton.