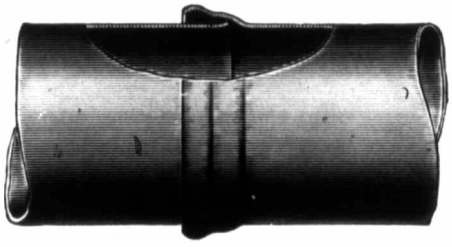
STEEL BELL AND SPIGOT PIPES

FOR

AIR - GAS - WATER - SEWAGE CONDUITS



DRUMMOND, McCALL & CO.

HEAD OFFICES: - MONTREAL

ALSO

TORONTO WINNIPEG CALGARY LONDONDERRY, N. S.

JANUARY, 1911

We ask your attention to our Bell and Spigot Steel Tubes which can be used to great advantage for gas, air, water and sewage conduits. They are **jointed** in exactly the same way as cast iron pipes and can be used in conjunction with them. The process of forming the socket from the solid steel pipe was first introduced twenty-five years ago by Messrs. Stewarts & Lloyds, Limited, of Glasgow, and from that date till now the demand for steel pipe lines has been increasing at a rapid pace.

These steel pipes can be supplied in **lengths up to 40 feet,** their **light weight** rendering such lengths as easily handled as the 12-feet cast iron pipes. Whenever considerable freights are involved, a great saving is effected as compared with cast iron pipes, not only as delivered at the point of destination but in the **cost of handling, setting in place,** and in the **cost of joints** and jointing material. Tubes can be **jointed on the surface** in lengths of about 200 feet and then rolled into position. This allows of **rapid laying** of pipes and, owing to the relative impermeability of the material of which they are made, to the reduction in the number of the joints and to the elasticity of the pipes and joints which render them tight, even under considerable subsidence and distortion, the pipe line is much less subject to leakage.

Freedom from Corrosion.

While in the early years of the introduction of steel mains some difference seems to have been shown by engineers on the question of corrosion, these fears have now been dispelled by experience. In the case of both cast iron and steel pipes it is found that, with the great majority of potable waters, the inside of the pipes, if in constant use (i.e. free from atmospheric influence), is practically unaffected. As regards the outside, the same is the case, provided the pipes are buried in good natural clay. In the presence, however, of salts or acids, more or less corrosion takes place and, while cast iron pipes have the greater thickness, they are more porous and usually corrode proportionately faster than steel, the life of each depending on the quality of the protective coating employed.

In recent years such external corrosion has been effectively combated by dipping the pipes hot in Dr. Angus Smith's Solution and sometimes by wrapping them with Jute Hessian and re-dipping in the Solution. The pipes are thus enclosed in a thick tough envelope. This special jute covering acts as a non-conductor and prevents damage by electrolysis or by extreme variation in temperature. As illustrating the efficiency of such a coating, we may instance the 30" mains of the South Staffordshire Mond Gas Company which were laid for a distance of some 30 miles through slag heaps refuse and ash tips—a quality of material which is generally considered of the most corrosive nature possible; notwithstanding which, recent inspection of these mains (made of steel with leaded joints) shows the coating to be as good as when just laid. The mains have proved practically tight for the conveyance of such a penetrative fluid as "producer" gas, illustrating to what a degree of perfection the joints of these pipes can be made.

In this connection we may quote the experience of Mr. Davidson, M.I.C.B., Inspector General of Public Works in Victoria, Australia. In 1887, when Melbourne laid down its first wrought mains (18" to 53" diameter), he wrote that if wrought pipes continued to be effective in the Melbourne Water Supply Scheme for fourteen years, and were then altogether abandoned, there would be an actual monetary gain at the then relative prices of cast iron and wrought pipes which made a difference of 50% in favour of the latter.

Again in January, 1909, he writes of the same pipes:

> "After twenty years use the pipes were found to be in excellent condition, both inside and outside. Internally the skin of the coating was intact, while on the outside there was not a sign of abrasion or rust."

Again a noted Gas Engineer speaking of a 50-mile stretch of 30" Pressure Gas Pipes laid some years ago states:

> "These mains have proved very effective and sufficiently flexible to meet the trying circumstances due to their being laid in subsiding ground. To test the ability of a ¼" steel pipe of 30" diameter to withstand a concentrated weight, a 14 feet length of pipe was half buried in sand and a piece of hard timber was placed in the centre of the pipe and loaded up to 6 tons. The only effect of this was to flatten the pipe to the extent of ¼" at the point of the application of the load after standing for six hours. Next day the load was increased to 8½ tons, and after 2 hours the pipe had flattened to 1⅛". The depression did not extend very far from the point of contact of the load, and the two joints which were placed in the horizontal plane were not affected, and a subsequent test of 400 lbs. hydraulic pressure proved that the joints had not been rendered leaky.
>
> "It may be gathered from these notes that steel pipes are now available, which not only cost considerably less than cast iron pipes when laid, but are more reliable where the conditions are made specially onerous by such circumstances as the ground being liable to subsidences."

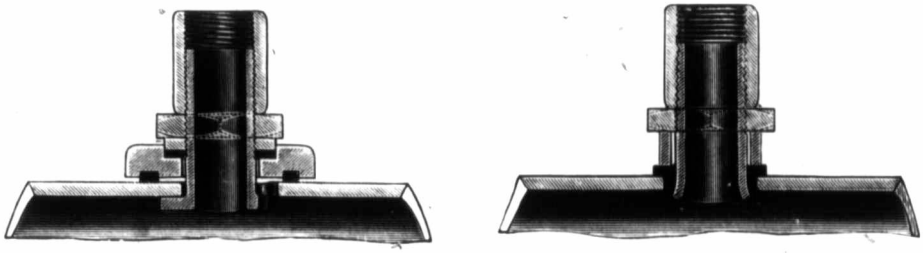
He also renders valuable testimony to the efficiency of wrapping with hessian (or jute) cloth as a safeguard against corrosion, in the following terms:

> "..... when steel pipes are properly protected by a bituminous coating, strengthened by the use of hessian cloth in the manner described, external corrosion is entirely removed, and the life of a steel pipe may be indefinitely prolonged. There is in fact no evidence to show that its life would not be as long as that of a cast iron pipe."

Following on such experience, and in similar results obtained in many cases elsewhere (wrought pipes for the water supply of Springvale, San Francisco, have now been in use for 40 years), steel pipes have been generally adopted for water pipes all over the world.

Freedom from Breakage.

Absolute immunity from breakage of these steel tubes is ensured. It is hardly possible to destroy a steel tube. You may distort its shape and bend it to any extent, even to doubling it on itself, but without fracture. This has proved an important feature with steel tubes in the smaller sizes applied in long lengths to gas and water services. They can be **bent at site** to suit the trenches in which they are laid.

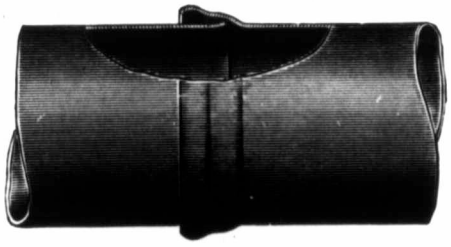


Tapping for Branch Services.

These branch services can be added to the pipes by means of special connections, as are illustrated above, and the same saddle fittings can be used for tapping steel pipe as for cast iron pipe. In this connection it may be mentioned that Messrs. Stewarts & Lloyds, Limited, have recently patented a very simple form of branch service connection applicable to their steel pipes, in respect of which some experiments were recently made to ascertain whether their use involved any frictional loss in the main. A 3" pipe about 200 yards in length and fitted with two dozen of these branch-service connections was laid at a gradient. The flow through the pipe was accurately guaged in a measuring tank before and after the insertion of the connections, showing the effect to be altogether negligible, being a fraction of 1% reduction in the discharge of the pipe.

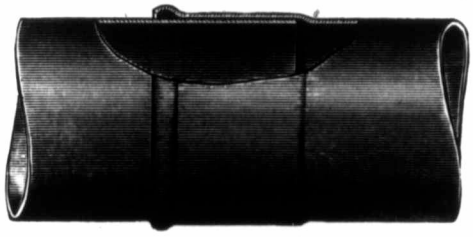
The Double Duty of the Lead Joint.

The lead joint has to perform the double duty of preventing leaks at pipe joints as well as to form a support for the adjoining pipe. Our **standard joint** is the one most generally adopted and which meets practically all requirements. The spigot is turned up and inserted in the socket, the joint being made with caulked yarn, followed by lead wire. This joint has sufficient elasticity to take up



Standard Joint.

ordinary expansion due to change of temperature, and to withstand any slight ground subsidence. In places where there is likely to be excessive subsidence of the ground or heavy vibration, leaks soon appear and the joints have to be repaired. To meet situations like this a **long-sleeve joint** is used. Into this joint, which has a slight taper, the pipe is driven hard and jointed with lead wire only. A pipe line fitted with these long sleeve joints may be treated as a continuous pipe, and any subsidence, or



Long-sleeve Joint.

even curves of large radius, may be taken up by the elasticity of these light steel pipes which deflect to the shape required **without disturbing the joint.**

In some cases the socket is supplied slightly thickened to withstand very heavy caulking.

In addition to these joints can be supplied what is known as the **"Kimberly Joint,"** which corresponds to the old "thimble" joint for cast iron pipes. A few of these are desirable in every pipe line set at regular intervals so as to avoid cutting out pipes where alterations may be necessary from time to time for the insertion of valves and specials.