

Key To The Treasury Of The Deep

OHGUSHI'S PEERLESS RESPIRATORS
UNRIVALLED IN THE WORLD



VIEW OF COLLECTING CORALS IN THE DEEP

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LETTERS PATENT OF OHGUSHI'S "RESPIRATORS"

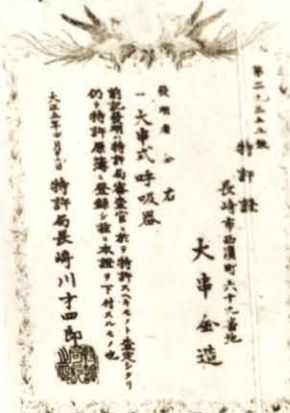
France. (Pat. No. 496,716.)



Japan. (Pat. No. 23,083.)



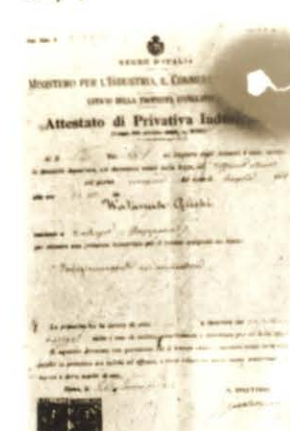
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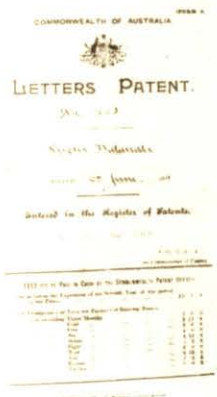
U. S. A. (Pat. No. 1,331,601)



Italy. (Pat. No. 167,966.)



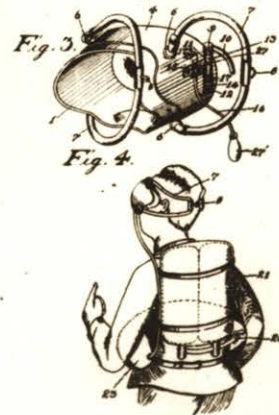
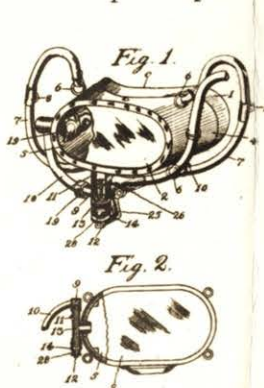
Australia. (Pat. No. 7,643.)



Spain. (Pat. No. 67,299.)



Complete Specification of "Respirators"



Mexico. (Pat. No. 17,425.)



India.(Pat. No. 3,703.)

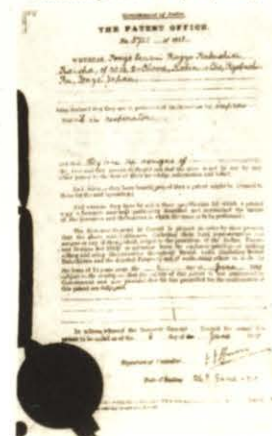
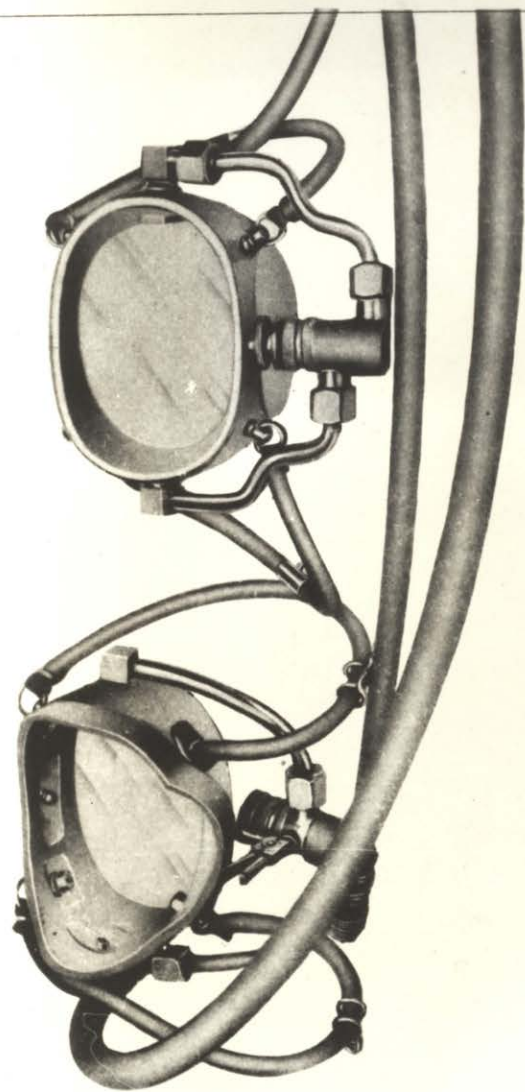
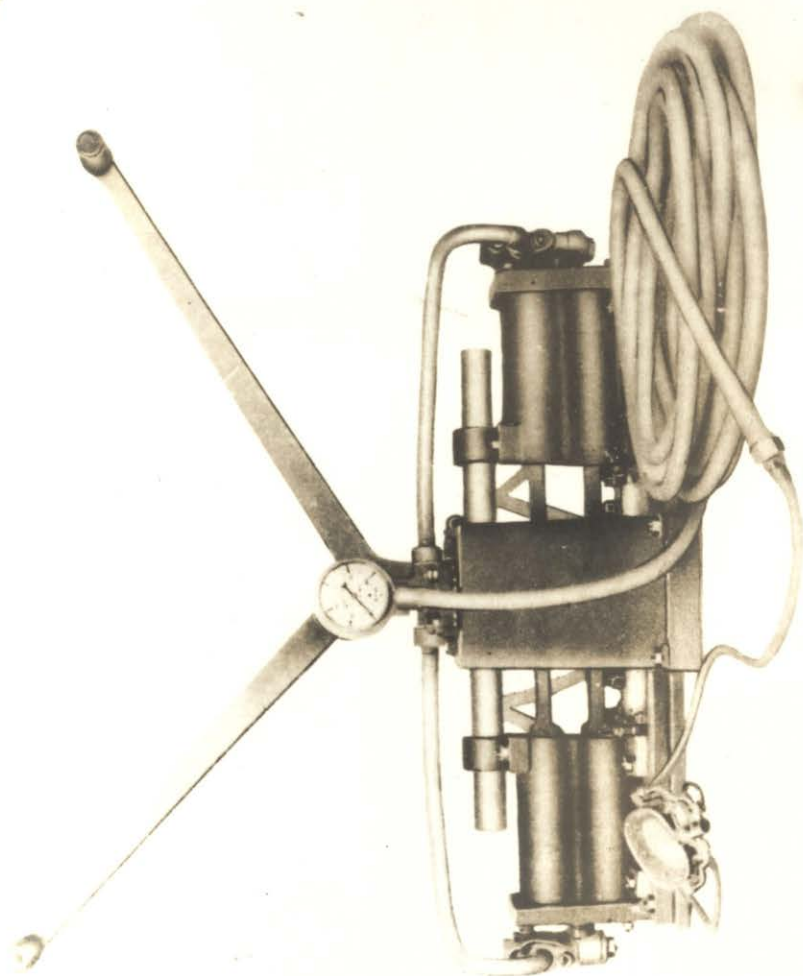


Fig. 1.



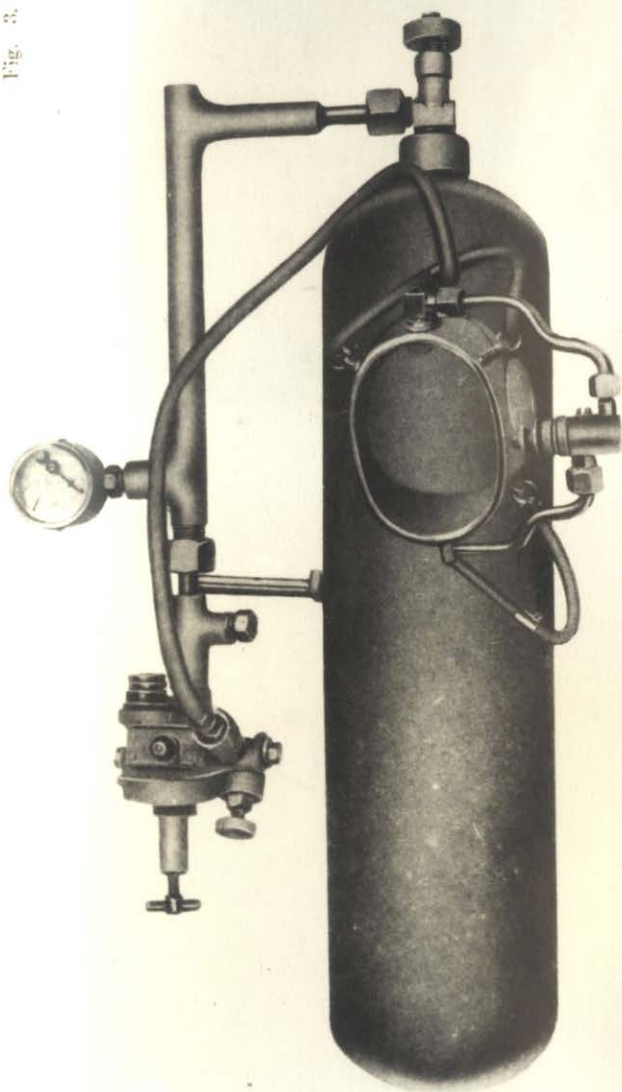
The Front and Back Views of Patented Ohgushi's Breathing Apparatus.

Fig. 2.



View of Ohgushi's Breathing Apparatus Connected with Patented Watamabe's High Pressure Air-Pump and Rubber Hose.

Fig. 3.



View of Ohgushi's Breathing Apparatus Directly Connected with a Compressed Air Bottle of 1,000 Litres Cubic Capacity at 150 Atmos.

Fig. 4.



The Front View of a Diver Full Dressed and Connected with the Air-Pump.

Fig. 5.



The Back view of a Diver Full Dressed and Connected with the Air-Pump.

Fig. 6.



The Front View of a Diver Dressed in a Diving Suit and Connected with a Compressed Air Pump.

Fig. 7.



The Back view of a Man Dressed in a Diving Suit and Connected with a Compressed Air Pump.

Important Addition to Submarine Work

1. General Explanation.

The influence of the Great European War upon the world's shipping has been very remarkable, and the fact that the activities of German submarine-boats caused the sacrifice of so many precious lives and valuable vessels is indeed a great loss to the world. The repeated casualties on the sea have stimulated the interests of the salvage work as well as the rapid development of submarine appliances, the principal mission of which is to do the very work. The improvement made in the construction and use of submarine appliances has brought about their practical applications in various directions. It has revolutionized not only the marine salvage work, but also fishery at large, and thus there has been done no little contribution to the development of marine business.

However, these diving apparati are of too great size, and the diver needs too heavy a suit of clothes, causing thereby a great resistance against water, which hinders the freedom of actions of the diver in water. Especially where the current is rapid his freedom is, in no small measure, restricted. Moreover, the apparati can not stand the heavy pressure of water. With them to do the work under the depth of 150. feet of water is almost impossible. According to the latest report from America the diving apparatus invented by Mr. Charles H. Jackson was used under the depth of 360 feet of water outside Boston Harbor, and that invented by Mr. Leavitt is said to have made the international record of 361 feet in Grand Traverse Bay, but judging from the dress and other things used by the diver, they are not fit for the practical use. It requires many years before they are brought to perfection. The Ohgushi's Breathing apparatus (diving machine) of our company is of the invention of a Japanese. It is the newest machine patented not only in Japan, but also

in Europe and America, and is provided with all the arrangements wanting in the other kinds of diving machines. It is not too much to say that it holds the unique position among diving machines of the world.

Fig 1. represents the Ohgushi's Breathing Apparatus. It is to be fastened to the face of a diver and is to be used for breathing the air which is sent into the mouth of the operator. There are two ways of sending air. The one is by means of a pump, and the other is by compressed air.

Fig 2. represents Watanabe's Air-Pump for the diving apparatus (patented). It is a high pressure pump capable of sending air of 200 atmos. It can be used for sending air of high pressure continuously from the ship above the water into the diver at work in the deep sea.

Fig 3. represents a steel bottle for compressed air. It holds 1,000 litres of compressed air at 150 atmos. The diver can carry it himself and the air pressure in the bottle can freely be adjusted for his own use in accordance with the depth of water by means of a reducing valve. The amount of 1,000 litres of air will last for twenty minutes at the depth of 300 feet of water, and forty minutes at the depth of 60 or 70 feet of water and easily one hour at the depth of 50 feet.

Fig 4. represents the front view of a diver dressed, being supplied with air by means of a pump.

Fig 5. represents the back view.

Fig 6. represents the front view of a diver carrying compressed air.

Fig 7. The back view.

2. Experiments and their Effects.

1. The experiment made in October, 1918, upon the diving apparatus of Yokosuka Harbour in the presence of the Naval authorities by their request won their high favour, and by their requests the machine was adopted in each and every naval station.
2. The machine was employed during the years extending from 1918 to 1919 in the taking into parts the Norwegian vessel Calendar sunk to the bottom of the sea outside Nagasaki Harbor at the depth of 200 feet of water and accomplished its object to the satisfaction. Another successful employment of the machine was made in taking into parts the English vessel Nile at the depth of 200 feet off the coast of Yamaguchi prefecture in 1919.
3. In July of 1919 by the request of the Kohchi prefectural authorities three different experiments were made upon the diving machine in the presence of the local prefectural authorities, members of the Fishery Association, journalists and others, and obtained the following results:

No. of Exp'ts	Place	Depth	Time
1st	Off Ashizuri-zaki	282 ft.	10' 10"
2nd	Off Kanoh-zaki	324 ft.	9' 10"
3rd	Do	284 ft.	15' 00"

Afterward we succeeded in collecting corals at the depth of 375 feet of water in the same prefecture.

In general, the characteristic features of our diving machine consist in the following points:

1. The simplicity of the machine construction and facility of its handling.
2. As the weight and bulk of the dress are little, its resistance against the current is small, so that the operator can do his work freely and easily.

3. After only a Week's practice even a beginner is able to dive down into the depth of 150 feet of water.
4. The diver can go down to the depth of over 300 feet of water to do his work, and moreover, he is nearly free from possible attack of any disease which divers are liable to suffer from.
5. The diver can prepare himself for the work in only two or three minutes.
6. The diver invested with the suit can get into or out of a narrow places easily.
7. There is absolutely no risk whatever for the diver even where he holds his head down.
8. No risk of injuring the health of the diver even though he may be engaged in a continuous work for many days.
9. In the case of being provided with compressed air a single boat can set several divers at work at the same time, and all the other working hands than the rope-holder can be dispensed with.
10. No expensive rubber suit is needed, but the ordinary suit of common working dress, working socks, and gloves.

3. Notice to the People Engaged in Salvage Work and Fishery at Large.

The diving work in our country is still in a primitive condition and the sphere of practical application of the diving machine is very narrow.

We can only find its application in the marine salvage work or in up-hauling the articles found in the bottom of the sea, and there are very few occasions which are availed by those who engage themselves in fishery. Many reasons may give rise to these effects, but the high cost of ordinary machines is the principal one.

In the worldly renowned fishery country like Japan practical instances of making use of the machine are very numerous. The collection and cultivation of pearls, collection of corals, sea-ears, kelps, and so forth are some of them. Yet it is a matter of regrets that the machine is still not in general practical use.

We urgently hope, with the diving machine of the afore-said special characteristics to carry on the work independently. Yet, as it is rather a hard task for us to conduct various kinds of the promising work by ourselves all alone, we wish to cooperate with, or request the assistance of other partners in the work, in order to un-lock the precious treasury of the deep.

The industrial firms patronizing our machines which are the powerful addition to the instruments used in submarine industry and wishing to extend their sphere of activities are cordially requested write to us informing the kinds of their work, addresses, actual conditions and other particulars, so that we may render them any possible assistance which is at our command.

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Directions for the Use of Ohgushi's Breathing Apparatus.

There are two instances in which the apparatus is used.

1. When diving with the supply of compressed air.
2. When diving with the supply of air by means of a pump.

Explanation 1.

When diving with the supply of compressed air.

Preparation.

Buckle the knap-sack to the air-bottle of 1,000 litres at 150 atmos. Attach the reducing valve to the stop valve at one end of the bottle. Examine the pressure of air contained in the bottle by means of the gauge. Exchange the gauge with the screw-lid and attach the diving machine to the mouth of the air-bottle, and carry the whole thing on back of the diver. In order to balance the weight of the front and rear of the diver and to increase his weight fasten a piece of lead weighing about 20 pounds to his front loins.

Adjust the mask to the face so as to fix the inner protruding part of it to the mouth of the diver, and turning the both ends of the rubber strings to the back of the diver's head where they are to be fastened together. (See Fig. 6 & 7)

In order to breathe, open the stop-valve of the tank and then adjust the current of air properly by the reducing-screw of the valve so as to complete the diving preparations.

Method of Breathing.

When the diver bites the inside protrusion of the mask, the current of air will pass inside the mask from its side. The quantity of air taken into the mask varies in accordance with the strength and duration of the bite. It will be best to adjust beforehand the amount of air by T shaped adjusting screw. The air should be breathed in through the nose and be exhaled into the water from the mouth of the diver. Should it be difficult

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to adjust the valve with the mouth of the diver and be hard to breathe on account of the air current being stopped or too much air being sent in, just pinch the upper end of the valve and wiggle it up and down so as to attain the proper adjustment.

Important Remarks.

1. The allowance of air for the breathing purpose is accelerated in proportion to the depth of water, so that the diver should adjust the amount of air to his own requirements by means of the reducing valve in accordance with the depth of water.
2. The duration of diving by using the compressed air-bottle of 1,000 litres at 150 atmos. is about 40 minutes at the depth of 75 feet of water.

The amount of consumption of air varies a little with each diver, but in general, for an expert, two or three breaths will be sufficient in a minute.

Explanation 2.

When diving with the supply of air by means of a pump.

Preparation.

Attach the diving-mask to the end of the hose connected with the pump, and fix the mask to the face of the diver so that he may bite the inside protrusion of the mask, and fasten both ends of the rubber strings at the back of his head. As the mask is not heavy enough to keep the diver down in water, it is necessary for him to carry about 30 pounds of heavy weight about his loins.

Method of Breathing.

Though it is nearly the same as when the aforesaid tank is used, yet as there is no reducing valve attached to this pump, the amount of air should be adjusted with the strength and duration of the bite of the diver at the inside protrusion of the mask. But the pumper may generally

adjust properly the amount of air which is to be sent to the diver by his constant watching at the gauge of the pump in accordance with the depth of water.

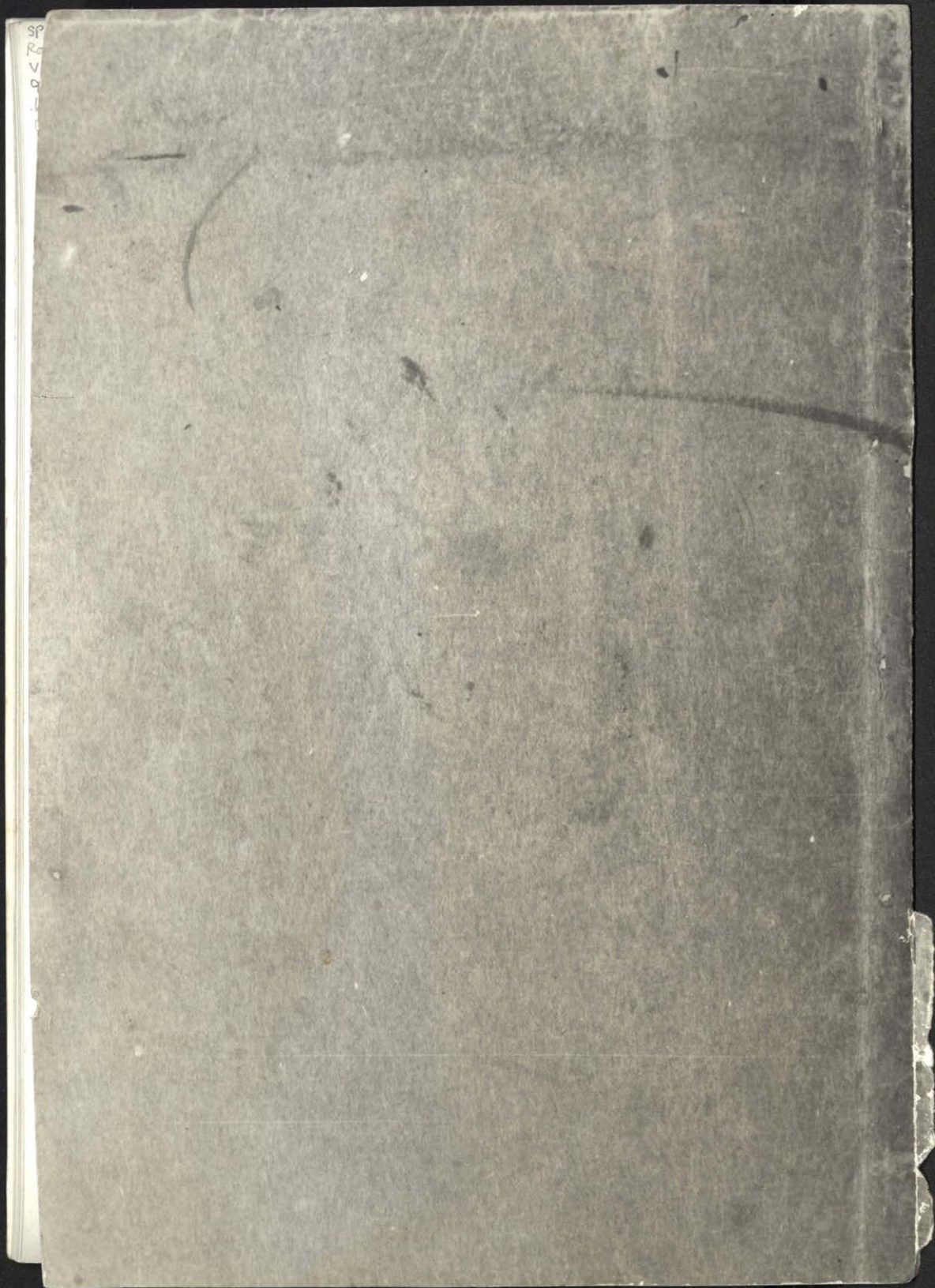
The pressure of atmosphere sent in by means of the pump is regulated by the following standard.

Depth	Pressure	Depth	Pressure
25 ft.	20 lbs.	50 ft.	40 lbs.
75 ft.	60 lbs.	150 ft.	80 lbs.
150 ft.	120 lbs.	200 ft.	160 lbs.
250 ft.	200 lbs.	300 ft.	240 lbs.

Remarks.

* There is no special style of the diving-suit to be worn by the diver donned with the machine, yet in order to keep him at a proper temperature and to allow him a complete freedom of actions in water a suit of woollen under-wear, working clothes and rubber-soled canvas-shoes are recommended to be the best outfit.

The end.



History of "Ohgushi's Peerless Respirator"

This mask style respirator was invented by Riichi Watanabe, Omura clansman of Kyushu, Japan. After Watanabe was graduated from Tokyo Fisheries Institute in 1904, he was engaged in fishery research, and established the Takashima Cultured Pearls Enterprise in Nagasaki Prefecture for the first time in Japan. Then he started the first step for invention of the mask style respirator with assistance of Kinzo Ohgushi, blacksmith at that time, and they made the utmost efforts for manufacturing design of the respirator as their life work and finally succeeded. In order to praise their achievement, it was named the "Ohgushi's Peerless Respirator".

The motive of invention of the respirator was born from necessity to collect mother shell of pearl for culture. At that time, the collection of mother shell of pearl was done by male skin divers. They thought that if one more respiration of air could be given to those divers underwater, efficiency should be twice, and they manufactured an iron cylinder of 7 litres containing 90 p.s.i. or 6.3 kg/cm² of compressed air at first, which could be carried on the back of a diver. A push valve of the hand-push style that enables to send air into the mask, was fixed on the left side of mask connecting an air hose therewith, and breathed air by controlling it with one hand. As they were accustomed to use it, their underwater stay hours were extended, but as to efficiency there was almost no difference with the helmet style respirator, owing to lower the inefficient valve by one hand.

In 1916 Captain Yumihachi Kataoka met Watanabe and corporated together to keep pace with development of the mask style respirator. The research was developed and the type of valve was changed from the Hand-move style open and close to the Bite style structure and the "Ohgushi's Peerless Respirator" was born, making a boast in the world.

In 1917 Captain Kataoka projected the Underwater Resources Research Team in Polynesian Islands, the territory mandated to Japan at the time, and researched successfully collection of the sea bottom products among Polynesian Islands and other islands with the actual test of the "Ohgushi's Respirator" by himself for about six months. From the good result, he had confidence of absolute profitable underwater operation for the warm sea bottom works.

In 1918 Tokyo Submarine Industrial Company was established for the purpose of marketing of the Ohgushi's mask style respirators, salvage works and collecting business of sea bottom products, using the respirator. (catalogue was issued at that time)

In 1922 by request of a Japanese lived in Thursday Island of Australia and for the purpose of extention to further foreign license of the Ohgushi's respirator patent, Captain Kataoka and three divers sailed to the Island.

After arrival there, the collection work test of deep sea products (pearl oyster shells) was performed off Dunley Island for the first time in the presence of Mr. May, vice president of the Torres Strait Pearl Oyster Shell Guild, and the representative of the Guild. Two divers dived twice and collected fifty nine pieces of the pearl oyster shells (family of Pteriidae) from the depth of 258 feet, and the test was very successful with the attendants' surprise.

to be continued:-

continued:-

The Torres Strait Pearl Guild and Members conferred and asked for purpose of use of the patented Ohgushi's mask style respirator in the sea of Australasia. The contract was made at the key money of 7,000 pounds sterling, and the Japanese team received 500 pounds sterling as the option money and returned to Japan. Then, the British Homeland Diving Equipment Manufacturers and Dealers started the opposition campaign and developed to the helmet divers' strike of the spot Guild members and finally the Guild was obliged to announce cancellation of the contract.

The enterprise that made the Ohgushi's mask style respirator famous in the world was the salvage work of 100,000 pounds sterling gold coins kept in a safe of s.s. "Yasaka Maru", 12,000 tons owned by Nippon Yusen Kaisha (N.Y.K.), which was sank by the German submarine off the mouth of River Nile, Egypt, in the Mediterranean Sea during the First World War in 1915, for which work the respirator took the principal part. In 1925 the main working team consisting of 10 persons of salvage engineers and divers led by Captain Kataoka was based on Port Said and chartered two work ships. After they fought against the disadvantage of the underwater work for about three months, they succeeded to recover 99,991 pound gold coins (say 100% accomplishment) from the safe of the "Yasaka Maru" sank at the sea bottom of 250 feet depth in the Mediterranean Sea. The world people were much astonished for the big news.

In 1934 Kataoka, president of Deep Sea Industrial Company, was engaged in the inspection work of the precious metals loaded on the sunken Russian Warship "HAXXMOB" off Tsushima Island of the Sea of Japan, principally using the Ohgushi's respirators and practised the deep operation for three years until 107 meters depth that was deemed the limit of compressed air diving. In 1950 a group led by Captain Akiyuki Suzuki graduated from Merchant Ship Higher School continued to inspect the inside of the aforesaid "HAXXMOB" with use of the Ohgushi's respirators.

Thus, the "Ohgushi's Mask Style Respirator" which was originally invented by Riichi Watanabe, assisted by the blacksmith Kinzo Ohgushi, showed its excellent function by Captain Yumihachi Kataoka in the world, while many distinguished divers had been grown up by Teinosuke Miura and Yasozaemon Yamashita in the fishery field. Then, it was adopted for the duty of the Japanese Underwater Unit during the Pacific War, but there has been no succeeding instructor for the respirator since the War ended.

The End.