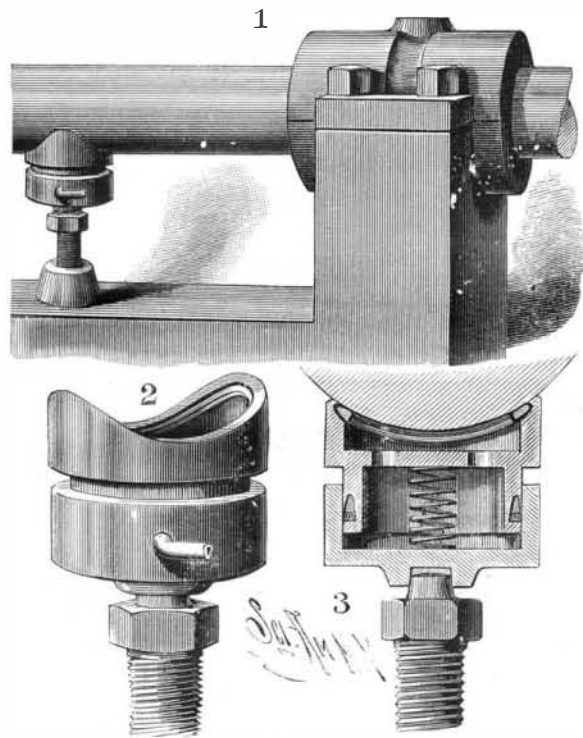


SUPPORTING AND END THRUST ANTI-FRICTION PADS FOR SHAFTS.

The accompanying engravings show an improved supporting pad designed to counteract the effect of the weight and friction of steamship shafts upon their bearings, also the friction on the journals of iron and steel rolling mills, and on all heavy bearings of what-



SUPPORTING PAD FOR SHAFTS.

ever nature, and also a pad designed to counteract the end thrust of propeller shafts. Both of these devices have been patented, by Mr. Valentine H. Hallock, of Queens, N. Y., in the United States and principal countries of Europe.

In order to relieve the bearings or journal boxes of the effect of the weight of the shaft, a supporting pad, consisting of two cylinders, one bored out to receive the other, as shown in Fig. 3, is applied to the shaft between the pillow blocks. In the circumference of the upper cylinder is a recess into which is placed leather packing held by a ring. When the pad is charged with water under pressure, the outer section of the packing

is forced against the inner surface of the under cylinder, and leakage at that point is prevented. The head of the upper cylinder is provided with holes and with a recess, and its face is concave to fit the surface of the shaft. Leakage between the pad and the shaft is prevented by a leather packing similar to the one already described. The spring shown in the cut serves to keep the head in contact with the shaft when the pad is not charged with water. By means of the screw upon which the pad rests, the latter can be removed from the shaft or can be pressed up against the shaft. The pad is supplied with water by a force pump connected by a pipe with the supply opening of the pad, as shown in Figs. 1 and 2. The pump is furnished with an air chamber and with a safety valve set at the maximum pressure required in the pad; when the pressure reaches the desired limit, the water blows off through the valve. The air in the chamber forms an elastic cushion, whereby the pressure in the pad is rendered yielding to some extent, and the friction between the pad and shaft is reduced to a minimum. The use of this pad materially reduces the wear of the journal boxes, since they are relieved of the pressure usually produced by the weight of the shaft.

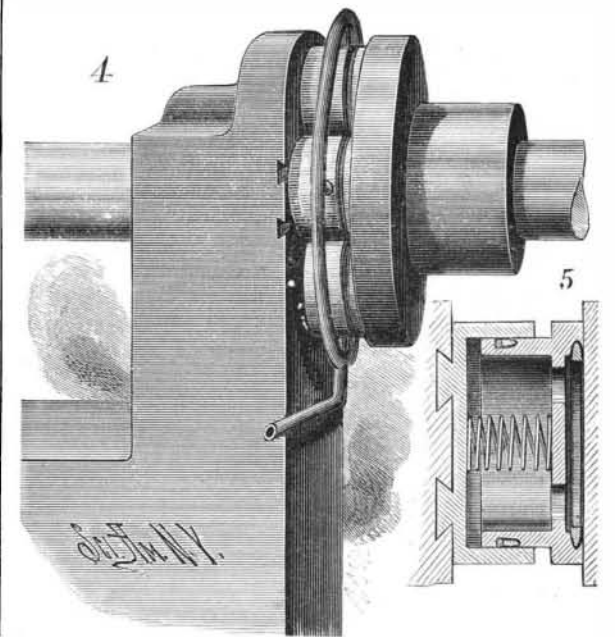
When designed to counteract the end thrust—as represented in the second engraving—several pads are secured on the face of the pillow block, and bear against a flange fastened on the shaft. In the cut four pads are shown, but the number may be decreased or increased, according to circumstances. The pads are formed with dovetailed ribs (Fig. 5), which engage with corresponding grooves in the face of the pillow block. The pads are formed of cylinders, one within the other, packed with leather held in place by rings like those above described. Between the outer face of the head of the cylinder and the flange is packing, which prevents leakage at that point. The spring keeps the head in contact with the flange when the pad is not charged with water. The pads are supplied with water by a force pump provided with an air chamber, acting as an elastic cushion, and with a safety valve set to discharge when the maximum pressure is reached. These pads, which may be applied to counteract the end thrust of the shaft in either direction, are reliable in operation, and their use will insure the saving of a large percentage of power. The arrangement of the pipes supplying the pads with water is clearly shown in Fig. 4.

It is claimed that the use of these inventions will result in a saving of both time and power in ocean

navigation, and will afford great advantages in overcoming friction in tools used in the manufacture of iron and steel.

IMPROVED APPARATUS FOR TRAINING HORSES.

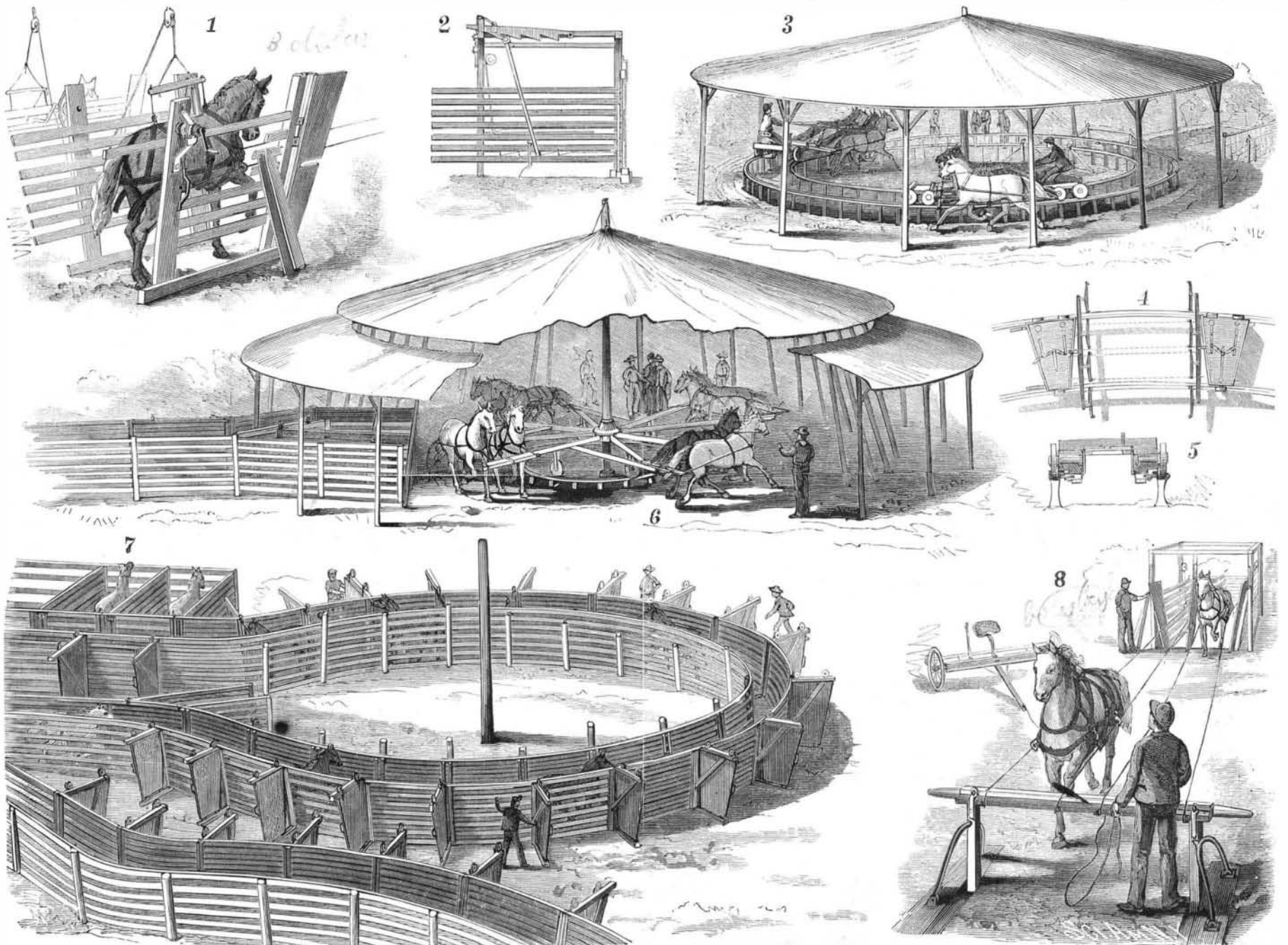
The accompanying engravings represent several appliances so designed as to cover every step in the breaking and training of horses. The apparatus possesses many excellent qualities; it does away entirely with the cruel practice, at present too common, of



END THRUST PAD FOR SHAFTS.

first lassoing the unbroken horse, then throwing it, and frequently choking and beating until the spirit of the horse is almost broken. The theory embodied in this system is, that kindness and firmness will subdue any animal, and in constructing this apparatus these two points were prominently and constantly before the inventor.

The harness, shown in Figs. 1 and 3, has side pieces or plates for conveniently attaching the horse to sliding pieces placed upon supporting ropes, and is so constructed that it will keep its place upon, and support the weight of the horse, no matter what position he assumes—whether he kicks, plunges, or



SHEDD'S IMPROVED APPARATUS FOR TRAINING HORSES.