T. OLSEN.
Testing-Machine.

No. 213,586. Patented Mar. 25, 1879.

Fig. I

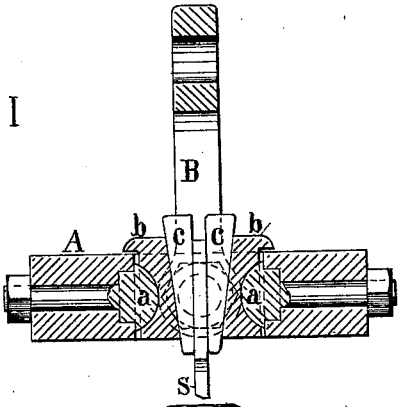


Fig. II

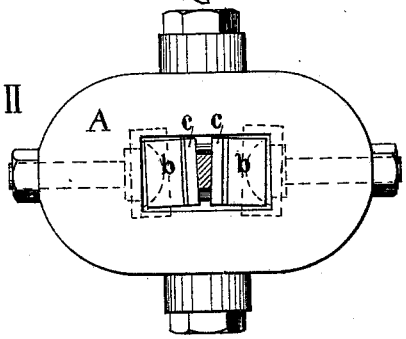
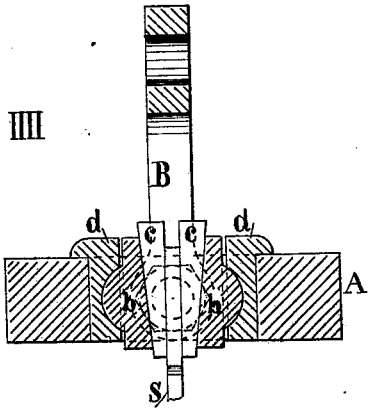


Fig. IIII



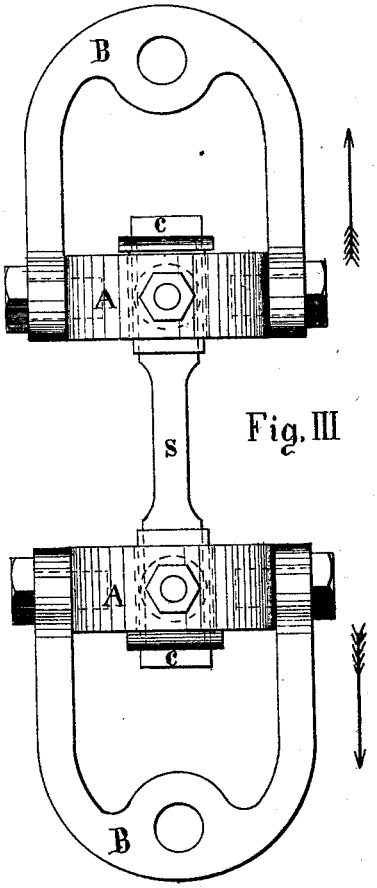


Fig. III

Witnesses.
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TINIUS OLSEN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN TESTING-MACHINES.

Specification forming part of Letters Patent No. **213,586**, dated March 25, 1879; application filed January 31, 1879.

To all whom it may concern:

Be it known that I, TINIUS OLSEN, of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Testing-Machines, of which the following is a specification:

My improvement in testing-machines applies to the clamps or holders in which the specimen is held for tensile test.

Heretofore such clamps have been made with a square tapering hole, in which the specimen is held by wedges. In case the specimen was not of uniform thickness, the same has been liable to be stretched more on one edge than on the other, and will not give correct results, especially in testing plate-iron.

Attempts have been made to overcome this difficulty by rounding the back of the wedges; but it will only accommodate the specimen in one direction, and does not adjust the line of strain to the center of the specimen, and is objectionable.

The object of my invention is to so arrange the wedges that they will adjust themselves to the form of the specimen, and for adjusting centrally the line of strain for same; and consists in a peculiar form of liners in the clamping-block, as backing for the wedges holding the specimen, by which a uniform gripe of the head of the specimen is obtained, and the line of strain is self-adjusting to its center.

In the accompanying drawings, in which similar letters of reference indicate like parts in all the figures, Figure I is a section through the clamp, through the center; Fig. II, a plan of same; Fig. III, side view of the two opposite clamps holding the specimen; Fig. IIII, a modification of the same.

The heads A A, Figs. I, II, and III, are, by stirrups B B, or in a similar manner, secured in the testing-machines, and the strain is applied, in the usual manner, in the direction of the arrows, the specimen S being held between the heads A A, and in the center of same.

In the heads A A is formed a square or rectangular hole. On the two opposite sides of the hole are made or secured the spherical heads *a a*, preferably made of steel. On these heads are fitted the ball-socketed and tapering liners *b b*, made so that they are perfectly free to move in the socket the desired amount for adjustment to the specimen.

The liners *b b* are made with a flange on the upper end, so they will not drop out of the head when the wedges *c c* are taken out. This flange, however, is made so that it does not interfere with the free motion of the liners.

Next to the specimen S, between same and the liners *b b*, are the ordinary flat wedges *c c*, for holding the same, as shown in the drawing.

The heads A A are secured to the stirrups B B by a swivel-joint on both sides of same, and in the same plane, but perpendicular to the center-line of the sockets of the liners, making the whole combined a universal joint in the center of the griping-wedges and head of specimen, by which the line of strain is adjusted to the center of the specimen.

Fig. IIII is a modification of the above-described, by reversing the ball and socket and introducing the second extra liners *d d*, to make the socket in, as this ball-socket joint is preferably made of steel and hardened, and the head of wrought-iron. There is nothing, however, to hinder the making of the socket in the head itself.

What I claim as my improvement is—

1. An improved specimen-holder for tensile test for testing-machines, by which the thrust of the wedges *c c* is taken by the spherical supported liners *b b*, forming, in combination with the head A and stirrup B, a universal adjustable vise, substantially as and for the purpose specified.

2. The liners *b b*, with ball-socket and spherical supports *a a*, in combination with head A, as and for the purpose specified.

3. The combination of heads A, by the stirrup swiveled in the plane through the center of the socket-joint of the liners *b b*, making a universal joint through the center of the clamping-wedges, substantially as herein specified.

TINIUS OLSEN.

Witnesses:

I. NORRIS DE HAVEN,

CHAS. ROBSON.