in the behavior of the flow lines can be produced by the presence of the
probe. The necessary fineness of the point can best be established by experiment. Finally, it may be mentioned that, considering the symmetrical form of
the flow pattern, it was only necessary to investigate one half of it with
the probe. It was inserted as close as possible to the bore-axis, such that
the bullet still could pass freely over the probe. Fig. 6 shows a photograph
in which the probe is located in the middle part of the flow pattern, and Fig.
7 one from which there resulted a measurement closest to the compression wave,
where the velocity is considerable less than in the middle. Accordingly, the
angle α of the wave at the point of the probe is considerably smaller in Fig.
6 than in Fig. 7. Since the wave is formed not only at the point, but also
it its farther surroundings (see Fig. 6), then from the curvature of the wave
it may also be understood that the velocity of the gas particles decreases with
greater distance from the muzzle. For the measurements, however, only the
straight part of the wave in the immediate neighborhood of the point was utilized. The diagram of Fig. 8 illustrates, on the basis of the results of measurement[1], in its upper part, the numerical values found, as well as the variation of the velocity along a typical flow line A. The flow velocities are
given in numerical values calculated on the basis of the velocity of sound
$v = 334$ m./sec. In reality this value should be different, since it would be
considerably changed by the pressure prevailing within the flow pattern, as
well as by the higher temperature of the gas. For clarity, however, the gas
velocities are given in absolute numbers. We intend to give the size of the
necessary corrections as soon as we are able to obtain closer estimates of the
temperatures and pressure relations within the flow pattern. The diagram shows,
first, that the velocity of the gas particles increases from the muzzle out to
about the middle of the flow pattern[2], and then rapidly decreases; second, that

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1) The points of measurement were established by means of a model of the
flow pattern in space fastened to the muzzle of the gun.

2) In the most immediate neighborhood of the muzzle, where for practical
reasons no measures can be carried out, considerably smaller velocities must be
present.